

*leg.* in TWP. *Paratypes*: (19 males): 4 males: Ecuador: *Bolivar*: Balzapamba, Río Alcacer, 04.XI.1996, I. Aldas *leg.*, in TWP; 1 male: *Pichincha*: Reserva Geobotánica Pululahua, 19.II.1997, 3000 m, A. NEILD *leg.*, in TWP; 11 males: *Cotopaxi*: Pilaló, IX.1996, 2500-3000 m, I. Aldas *leg.*, in PUCE (1 male), MALUZ (1 male), in ZMHU (1 male), in MZUJ (1 male), in TWP (7 males); 2 males: same data as allotype, in TWP; 1 male: *Bolivar*: Talahua, 03.III.1899, P. O. SIMONS, purchased from ROSENBERG, in BMNH.

#### ETYMOLOGY

The name is derived from the word "bingo", a popular gambling game and an exclamation of happiness.

#### REMARKS

See under *L. nivea bonita*.

### *Lymanopoda nivea bonita* PYRCZ, n. ssp.

(Figs 15 & 19)

#### DIAGNOSIS

This subspecies differs from nominate *L. nivea* (Fig. 13) and *L. nivea sororcula* THIEME, 1904, in having the forewing white postdiscal patch entirely enclosed within a black area, from *L. pteridina* ROBER, 1927, in having an entirely white forewing discal cell and the hindwing dorsal surface distal margin not edged with black, and from *L. nivea bingoi* in the sandy yellow hindwing underside, similar to *L. labineta*. The male genitalia closely resemble those of *L. nivea bingoi* (Fig. 25), while the dorsal process on the valvae is more prominent than in *L. nivea sororcula* (Fig. 26).

#### DESCRIPTION

Male (Fig. 15) *Head, thorax and abdomen* as in *L. nivea bonita*. *Wings*: forewing (length 21-22.5 mm, mean: 22.2 mm, n=10) apex slightly acute, outer margin truncate; hindwing outer margin rounded, tornus slightly angular. Forewing dorsal surface basal area, and towards postbasal area along costa and inner margin, suffused with blue-grey; remainder of wing divided into two areas, basally white from discocellular veins and from basal 2/5 of space Cu<sub>1</sub>, 3/5 of space Cu<sub>2</sub>, and 5/6 of space 1A+2A, distally black, except for a white rhomboid postdiscal patch of variable size, in some specimens faint and barely noticeable, and concave row of three white spots in spaces M<sub>1</sub>-M<sub>3</sub>, and an additional white spot within black area in space Cu<sub>1</sub>. Hindwing white, except for blue-grey basal area, filling basal half of discal cell, from vein Cu<sub>2</sub> to anal margin, and on distal margin; distal margin black; in some individuals a suffusion of black extending basally from outer margin, reaching submarginal area. Forewing ventral surface

pattern mirrors that of dorsal surface, except that ground colour of distal half is not black but brown in postdiscal area and sandy yellow distally from it, in apical area and along outer margin to tornus. Hindwing sandy yellow, dusted with brown scales, more densely in basal area, anterior half of discal cell, along posterior edge of discal cell, and on outer margin from mid space M<sub>1</sub> to tornus; in some specimens a row of five minute black submarginal dots in spaces M<sub>1</sub> to Cu<sub>2</sub>, with the dot in M<sub>3</sub> displaced basally in relation to the others. *Male genitalia* (Fig. 19): similar to *L. nivea bingoi*.

Female: unknown.

#### TYPES

*Holotype male*: Ecuador: *Carchi*: east of Huaca, 2900-3200 m, III.1999, I. Aldas *leg.*, in MZUJ; *Paratypes* (9 males): 7 males: same data as the holotype, in MB; 2 males: same locality as the holotype, X.1998, K. WILLMOTT *leg.*, in KWH.

#### ETYMOLOGY

This subspecies is named after the locality of La Bonita in the province of Sucumbios.

#### REMARKS

*Lymanopoda nivea* and *L. labineta* belong to a group of closely related species including also *L. pteridina*, which are all characterised by a series of common morphological and ecological features. They have a similar wing shape, particularly the truncate forewing outer margin below the apex, black and white wing pattern and configuration of subapical and postmedian dots on the ventral surface, and male genitalia characterised by a prominent, stout dorsal process on the valvae. They are all inhabitants of the uppermost cloud forest, usually flying in humid forest gullies near the forest-páramo ecotone, or in the lower páramo. They are replaced parapatrically at slightly lower elevations by the "brown" species, *L. excisa*, with which they share most of their morphological features, and with which they most probably belong in a monophyletic group. The "white" species of the "*L. nivea* group" are allopatric, available data indicating that *L. nivea bingoi* n. ssp. occurs only on the Pacific slopes of the western Ecuadorian Andes, from 2500-3000 m, being replaced eastwards by *L. nivea nivea*, which occurs along the main ridge of the Western Cordillera. *L. nivea sororcula*, which occurs on both the eastern and western slopes of the Eastern Cordillera in central Ecuador and *L. nivea bonita* found in the Eastern Cordillera in northern Ecuador. BROWN (1943) produced an interesting survey of Ecuadorian *Lymanopoda* (although he referred also to non-Ecuadorian species), but unfortunately, having no access to the type material, he misidentified many of the taxa. He actually collected *L. nivea bingoi* (3 males at Hacienda Talahua) but thought that it represented *L. melia* (Fig. 14), which he considered to be a subspecies of *L. nivea* (Fig. 13). He also erroneously considered *L. sororcula* to be an individual "rusty"

form of *L. nivea*. Moreover, Brown collected *bona fide L. melia* at Hacienda Talahua, which he again misidentified as *L. eubagioides* BUTLER, 1873, a south Peruvian species (BROWN 1943: 91). *L. nivea bingo* and *L. melia* are sympatric and synchronous in the Talahua and Pitaló areas. *L. melia* belongs to the second group of *Lymanopoda* flying in the uppermost forests and páramo grassland, which includes *L. huiliana* and *L. caracara* n. sp. (described above). They are characterised by having a single process on the valvae of the male genitalia. ADAMS (1986) also referred to BROWN's work and pointed out correctly that Brown had misidentified *L. nivea* and *L. melia*, but was wrong in assuming that *L. melia* is restricted to the Colombian Central Cordillera. Also it is worth noting here that D'ABRERA (1988: 817) illustrated *L. caeruleata* GODMAN & SALVIN, 1880, as *L. pieridina*.

*Lymanopoda hazeliana summa* PYRCZ, n. ssp.

(Figs 9 & 10)

*Lymanopoda hazeliana* BROWN, 1943: 89, pl. 1, fig. 1623 (male genitalia). Holotype male in AMNH [not examined].

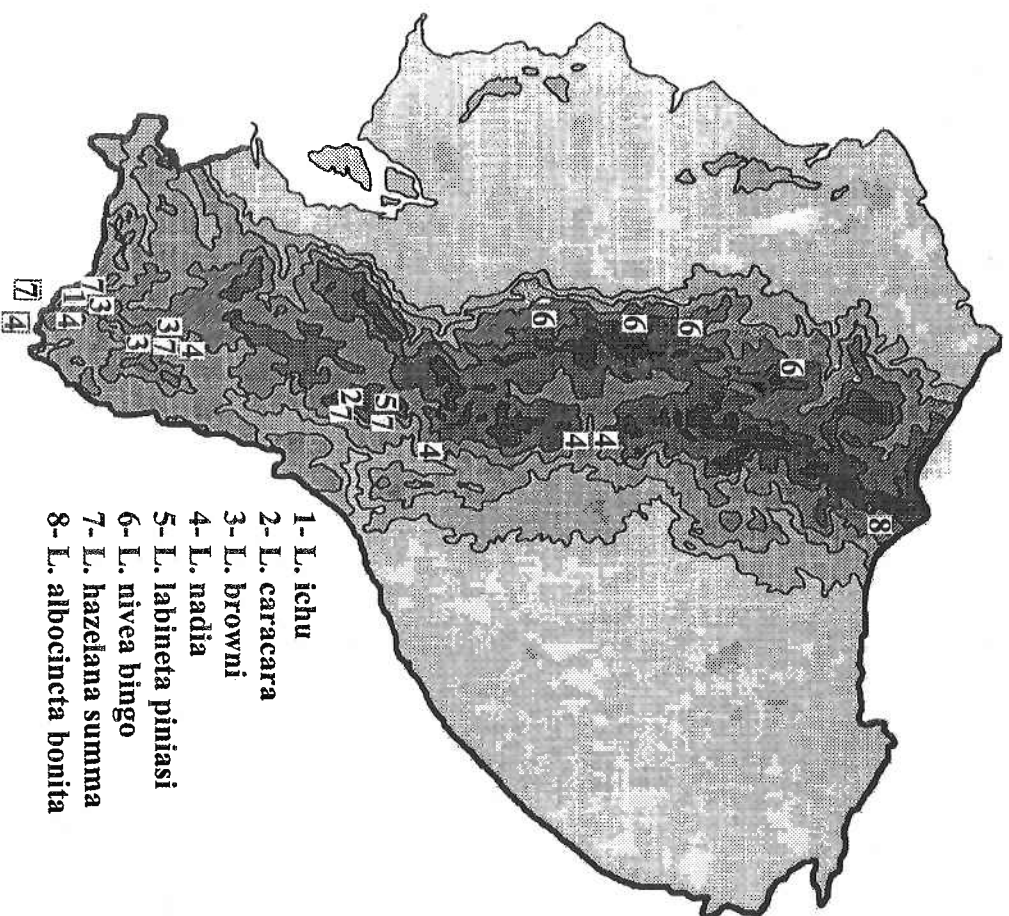
DIAGNOSIS

*L. hazeliana summa* n. ssp. differs from the nominate subspecies (Figs. 11 (male) & 12 (female)) in the colour of the dorsal surface, which is a more bluish green, and is more extensive in the submarginal areas of both wings, particularly in spaces 1A+2A-Cu<sub>1</sub>; the result is that the hindwing submarginal (limbal) black dots usually appear detached from the marginal band and may be almost entirely surrounded by green. In addition, the dorsal forewing postdiscal green markings are all larger, the costal marking extending into space M<sub>3</sub>.

DESCRIPTION

**Male** (Fig. 9): *Head*: frons dark brown; eyes brown with sparse setae; labial palpi twice length of head, covered with pale brown hair ventrally and dark brown hair dorsally; antennae 1/2 length of costa, brown dorsally and paler brown ventrally, club flattened costally, blackish brown dorsally, very few white scales at base of each segment in basal half. *Thorax*: dorsally blackish brown, ventrally pale brown, covered with short, sparse hair; legs pale brown. *Abdomen*: dorsally blackish brown, ventrally pale grey. *Wings*: forewing (length: 18.5-22 mm, mean=20.46 mm, n=37) triangular, hindwing angular. Forewing dorsal surface ground colour dark brown, basal third of costa orange-brown; basal half bright bluish green, filling discal cell and basal third of space Cu<sub>1</sub>, basal half of space Cu<sub>2</sub>, and basal 2/3 of space 1A+2A and anal margin; bright bluish green postdiscal marking at costa extending from space M<sub>1</sub> into space M<sub>3</sub>, two green subapical spots, three green submarginal spots in spaces 1A+2A-Cu<sub>1</sub>; four post-medial dots in spaces Cu<sub>1</sub>-M<sub>1</sub>, that in Cu<sub>1</sub> displaced basally with respect to others.

Hindwing dorsal surface ground colour dark brown, basal two-thirds bright bluish green, diffuse submarginal green spots in spaces 1A+2A-M<sub>2</sub>, those in 1A+2A-Cu<sub>1</sub> almost joined to basal green area and encircling black spots. Forewing ventral surface ground colour pale yellow-brown, with some darker brown scaling in discal cell and subapical and submarginal areas; three large black postmedial spots with central white pupils in spaces 1A+2A-Cu<sub>1</sub>, two more distally displaced white postmedial dots in spaces M<sub>3</sub> and M<sub>2</sub>. Hindwing ventral surface ground colour pale yellow-brown, mottled entirely with darker brown scaling. *Male genitalia* (not illustrated): as in nominate subspecies (see BROWN, 1943).



29. The distribution of new *Lymanopoda* taxa in Ecuador

Female (Fig. 10): Forewing length: 19-20.5 mm, mean=19.75 mm,  $n=2$ . Lighter on dorsal surface than male, otherwise differs from nominate subspecies in same respects as male.

#### TYPES

**Holotype male:** Ecuador: *Zamora-Chinipe*: Ancienne Route Loja-Zamora, 10-18.II.1993, 2500 m, B. MÉRÉ & S. ARTAL *leg.*, in MZUJ. **Allotype female:** same data as holotype, in TWP. **Paratypes** (83 males, 9 females): Ecuador: *Zamora-Chinipe*: 15 males: same data as holotype, in TWP; 1 female: same locality data as holotype, 24.II.1993, in TWP; 1 female: same locality data as holotype, XI.1997, I. Aldas *leg.*, in TWP; 1 male: Ancienne route Loja-Zamora, 20.II.1993, 2700 m, B. MÉRÉ & S. ARTAL *leg.*, in TWP; 1 male: same locality data as preceding, 24.II.1993, in TWP; 3 males: same locality data as preceding, 09.XI.1996, S. ARTAL *leg.*, in TWP; 1 male: km. 34 Jimbura-San Andrés rd., 2900 m, 23.IX.97, K. R. WILLMOTT *leg.*, in KWIJH; *Loja*: 4 males, 2 females: Loja-Zamora, 2600 m, 22.XI.1996, P. BOYER *leg.*, in PB; 1 male: environs de Loja, Ecuador, 1887, Doguin, in BMNH; 6 males: Cajanuma, 10.XI.1996, 2700-2800 m, A. NEUD *leg.*, in TWP; 2 males: same locality data as preceding, K. R. WILLMOTT *leg.*, in KWIJH (1 male), to be deposited in MNHN (1 male); 2 males: Lagunillas, South from Amaluza, 03.V.1997, 2600-3000 m, A. JASINSKI *leg.*, in TWP; 6 males and 1 female: same locality and collector, 15.V.1998, in TWP (4 males), MUSM (1 male), AJ (1 male and 1 female); 2 males: same locality and date, P. KRÖL *leg.*, in TWP; 1 male: Route Loja-Catamayo, km. 19, 2250 m, 23.II.1993, in TWP; 1 male: km. 14 Jimbura-San Andrés rd., 3000 m, 22.IX.97, K. R. WILLMOTT *leg.*, in KWIJH; 2 males & 1 female: Cerro Palma, km. 27 Loja-Cuenca rd., 3000 m, 7.IV.95, J. P. W. HALL & K. R. WILLMOTT *leg.*, in KWIJH; *Morona-Santiago*: 1 male: Limón-Gualaceo, 03-04.XI.1996, 3000m, A. NEUD *leg.*, in TWP; 15 males & 1 female: Granadillas-Chiguinda rd., 3000-3200 m, XI.1997, I. Aldas *leg.*, in TWP; 1 male: Gualaceo-Chiguinda rd., east of pass, 2800-3000 m, 20.XI.97, K. R. WILLMOTT *leg.*, in KWIJH. *Vague data*: 1 male, Sarayacu, eastern side of the Andes, Ecuador, Buckley, 1879, in BMNH; 2 males: Ecuador, Hewittson coll., in BMNH; 1 male: Ecuador, ex coll. GROSSE-SMITH, in BMNH. PERU: *Cajamarca*: 1 male: Manchara, N. Peru, 7000 ft., Sep. 1912, A. & E. PRATT, in BMNH; 6 males: Tabaconas, Peru, I. Aldas *leg.*, in TWP; *Vague data*: 1 male: Peru, DRUCE coll., in BMNH; 5 males: west slopes of Andes, N. Peru, 10000 ft., June 1912, PRATT, in BMNH. Erroneous or no locality: 1 male: „Brazil” (erroneous locality), ex coll. GROSSE-SMITH, 1844-5, in BMNH; 1 female: HEWITSON coll., in BMNH; 1 female: ex coll. GROSSE-SMITH, in BMNH.

#### ETYMOLOGY

The name is derived from the Latin word “*summa*”, meaning “in the first place”, for its dominant position in the distribution pattern of *L. hazelana*, compared to the much more geographically restricted nominate subspecies.

#### REMARKS

Rather unexpectedly, Brown (1943) described *L. hazelana* based on a single specimen representing a local population endemic to the inter-Andean valley of Cuenca, or, more precisely, the upper headwaters of the Rio Paute, whereas *L. hazelana summa* n. ssp. is widespread and common elsewhere in southern Ecuador, on both the eastern (Morona-Santiago, Zamora-Chinipe) and western (Loja) slopes of the Andes and in northernmost Peru (Tabaconas). It was fairly well known to early European lepidopterists, as there are specimens of it in the collections of HEWITSON, BUCKLEY, PRATT, DOGGIN and DRUCE in the BMNH. However, they all misidentified it as the confusingly similar Colombian species *L. samius* WESTWOOD, [1851], (see DOGGIN, 1891). *L. hazelana summa* resembles *L. samius* even more closely than the nominate subspecies, which was compared by Brown in his original description (*op. cit.*) to *L. caeruleata*. *L. hazelana summa* is readily distinguished from *L. samius* by comparing the row of hindwing submarginal black spots, which are parallel to the outer margin in *L. hazelana* but incurved in *L. samius*. Despite a striking resemblance in colour patterns and wing shape, *L. hazelana* and *L. samius* are not even closely related and, as indicated by their genitalic structures, belong in different lineages of the genus *Lymanopoda*, the former being related to *L. ichu* and *L. melia* and the latter possibly to *L. ionius*. There is some individual variation in the ground colour of *L. hazelana summa*, and some individuals have a noticeable greenish sheen, but not even approaching that of the nominate subspecies, and in some individuals the hindwing outer margin is as wide as in the nominate subspecies, but without affecting the size of the forewing postdiscal blue-green spot, which is always well developed and invariably extends into three cell spaces. Two specimens from Balzapamba (Bolivar) are greener than extremes of *L. hazelana summa* and given their origin may well represent a slightly differentiated population of the western slopes in central Ecuador. They are tentatively associated with *L. h. summa* but are not included in the series of paratypes.

*L. hazelana* inhabits the uppermost cloud forests and lower edge of the páramo. Locality data indicate that it occurs from 2250 to 3200 m, though it is most common above 2600 m, and it is usually seen in bright sun flying just above the surface of large stands of bamboo. Males appear to follow fairly fixed flight paths above and around clumps of bamboo, and are strongly attracted to rotting fish bait. TORRES et al. (1996) suggested a possible mimetic relationship between blue-green “elfin” lycanids (genera such as *Rhamma* JOHNSON, 1992, and *Podonotus* TORRES & JOHNSON, 1996) and *L. hazelana*, but we also suggest that this unique blue-green colour might also simply have evolved convergently as a disruptive colour pattern in flight.

