

STUDIES IN THE GENUS *HYLEPHILA* BILLBERG, II. THE *BOULLETI* SPECIES GROUP
(HESPERIIDAE: HESPERIINAE)

C. DON MACNEILL

Department of Entomology, California Academy of Sciences, Golden Gate Park, San Francisco, California 94118, USA

ABSTRACT. This is the second of three papers on the genus *Hylephila* Billberg (1820). The first paper introduced the genus and, emphasizing male and female genitalia, defined four species groups, two of which, the *ignorans* and the *venusta* groups, were treated in detail. The present treatment keys adults; illustrates adults, stigma pockets (male), and genitalia (male and female), and maps the known distribution of the species of the *boulleti* group, seven of which are described as new. Although specimens (especially females) are woefully scant, their characters seem to suggest two subgroups with five known species each. Subgroup I has *H. herreraei*, **new species**, *H. pseudoherreraei*, **new species**, *H. pallisteri*, **new species**, *H. blancasi*, **new species**, and *H. tentativa*, **new species**. Subgroup II comprises *H. shapiroei*, **new species**, *H. galera* Evans, *H. boulleti* (Mabille), *H. rossi*, **new species**, and *H. peruana* Draudt. Examination of the male and female genitalia is generally necessary to be certain of the identity of a specimen, but wing patterns and some structural characters may permit a “good guess” once familiarity with these skippers is established. Ova of two species were obtained by dissection, and these are described briefly for the first time.

Additional key words: South America, oreal (of high mountain), altiplano, Andes, dashed *Phulia* pattern, genitalia (male and female), stigma pockets.

In a previous paper (MacNeill & Herrera 1999) on the genus *Hylephila* Billberg (1820), we introduced the genus, emphasized the importance of male and female genitalia, and reviewed earlier attempts to illustrate these. We recognized, defined, and provided a superficial key to four species groups. We mapped three of these groups which are principally Andean, and treated two of them, the *ignorans* group and the *venusta* group, in detail. We also discussed and figured *Linka lina* (Plötz 1883) owing to confusion about its relationship to some high altitude species of *Hylephila*, especially the *boulleti* group (Shapiro 1994:44, 45), which is treated here in detail. Techniques, methods, and materials—as well as terminology—used in that study also apply in the present paper. A third paper (MacNeill in prep.) will treat the remainder of the genus, the *phyleus* group.

Specimens were examined from several institutions listed below, abbreviations are as follows throughout the text and figure legends:

AME: Allyn Museum of Entomology, Florida Museum of Natural History, Sarasota, Florida.

AMNH: The American Museum of Natural History, New York, New York.

BMNH : The Natural History Museum, London, England.

CAS: California Academy of Sciences, San Francisco, California.

CMNH: Carnegie Museum of Natural History, Pittsburgh, Pennsylvania.

IEUM: Instituto de Entomología, Universidad Metropolitana de Ciencias de la Educación, Santiago, Chile.

IML: Instituto de Zoología, Fundación Miguel Lillo, San Miguel de Tucumán, Argentina.

HNHM: Hungarian Natural History Museum, Budapest, Hungary.

LACM: The Natural History Museum of Los Angeles County, Los Angeles, California.

MUSM: Museo Nacional de Historia Natural, Universidad Mayor de San Marcos, Lima, Perú.

UCD: Bohart Museum of Entomology, University of California, Davis, California.

UFPC: Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brasil.

USNM: National Museum of Natural History, Smithsonian Institution, Washington, D.C..

THE *BOULLETI* GROUP

The ten species of the *boulleti* group all look very much alike superficially. It is usually necessary to dissect the genitalia to identify a specimen. These are small to medium-sized skippers (forewing length 8.5 mm–15 mm). The body is blackish, but the black tegulae are contrastingly and broadly edged with pale yellow or white. On both surfaces of the secondaries (Figs. 32–57) there is a well-defined ray in the cell (at least distally) and through spaces M1–M3. Bold black spots are characteristic on the ventral surface basally, postmedially, and marginally, where they appear to be defined or cut by white or pale veins. This gives the group an appearance when at rest that Shapiro (1985:8–10) has called “the dashed *Phulia* pattern”—a common pattern at rest shared by some high altitude pierids and hesperiids of oreal bogs and meadows, and this may well be, as Shapiro suggested, the result of convergence for crypsis at rest. He noted that these swift flying animals are remarkably difficult to find at rest, even when very abundant.

The species of this group occur in the high Andes from central and southern Perú, western Bolivia, and north-eastern Chile into northwestern Argentina and the pre-Andean Nevadas del Aconquija (the Sierras Pampeanas), just west of San Miguel de Tucumán, Ar-

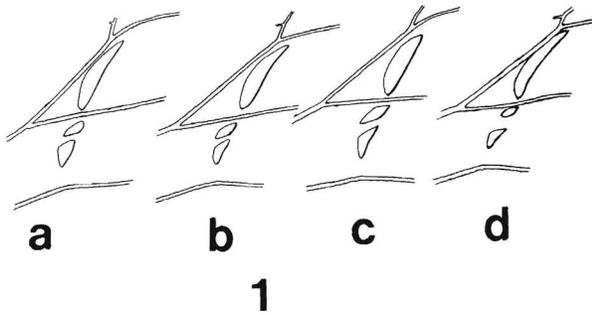


FIG. 1. Diagrams of stigma pockets in males of three species of *Hylephila*. **a**, *H. pallisteri*, new species holotype, PERÚ, Cuzco, Ollantaitambo, III-24-47, 9200 ft., C. J. Pallister (genital dissection # ♂ 3811-JH), in AMNH. **b**, *H. pallisteri*? PERÚ, Cuzco, Abra Acjanacu, 3600 m, V-17-84, G. Lamas (genital dissection # ♂ 6227-CDM), in MUSM. **c**, *H. blancasi*, new species holotype, Santia, donated 1902, P. forte [sic] (genital dissection # ♂ 3873-JH), in AMNH. **d**, *H. tentativa*, new species holotype, PERÚ, Ay[acucho], Rio Apacheta, 4200 m, 13°21'S, 74°39'W, I-24-99, C. Lamas, (genital dissection # ♂ 6308-CDM), in MUSM.

gentina. All of the species in this group except one are known from Perú, and the exception almost certainly occurs there too.

Because they are found at high elevations where both the weather and access are often limiting, and because of their crypsis (see above), these species of *Hylephila* are not often collected and they remain rare in collections. I have seen more than five specimens of only two of the ten species and females of only five of these (three are single specimens), and I have seen only one male specimen of four of the ten species.

Evans (1955) treated three species of this group as two subspecies of *H. bouletti*, (Mabille 1906), *H. b. bouletti* and *H. b. peruana* Draudt (1923), and one new species, *H. galera* Evans. Seven additional species are described in this paper. Given the general paucity of material, I must admit to some hesitation regarding the possibly presumptive classification presented here for this group of *Hylephila*.

Based upon the male and female genitalia, the species of this group sort rather well into two subgroups. The males of the five species in the first subgroup tend to have the anterior half of the uncus rather rounded in dorsal view and the gnathos is massive and caudoventrally somewhat divergent from the uncus in lateral view (Figs. 12–18); two solitary female specimens lack a detectable sclerotized eighth sternite (Figs. 26, 27). The other subgroup of five species has males with the uncus more or less triangular in dorsal view, with minute lateral serrations caudally, the gnathos not as divergent ventrally from the uncus (Figs. 19–25), females have a distinctly sclerotized eighth sternite.

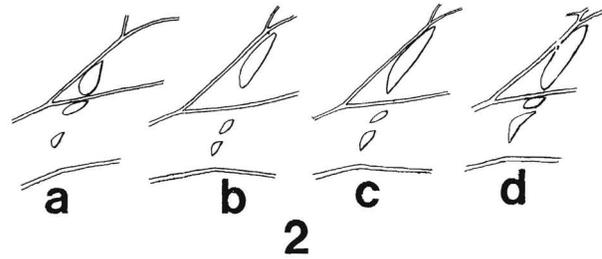


FIG. 2. Diagrams of stigma pockets in males of two species of *Hylephila*. **a**, *H. shapiro*, new species holotype, PERÚ, Junín, vic. Abra Anticona, 4843 m, X-19-83, A. M. Shapiro (genital dissection # ♂ 5005-JH), in CAS. **b**, *H. galera* holotype, PERÚ, Junín, Galera Pass, 4800 m, II-?-00, (Simons), in BMNH. **c**, *H. galera*? PERÚ, Junín, Tarma, 3000 m, I-29-72, (genital dissection # ♂ 6121-CDM), in LACM. **d**, *H. galera*? PERÚ, Yauli, Corpacancha, 4300 m, 11°22'S, 76°13'W, I-18-97, R. Acero (genital dissection # ♂ 6307-CDM), in MUSM.

ARTIFICIAL KEY TO SPECIES

- 1- Male without a stigma 2
- 1'- Male with a stigma 3
- 2- Hindwing above with fulvous of space M1–M3 a short, broad ray, not broadly entering discal cell; below, vannal fuscous area wide, broadly entering space Cu1–2A *H. herrera*, new species
- 2'- Hindwing above with fulvous of space M1–M3 a long ray broadly entering discal cell nearly to base; below, vannal fuscous area narrow, confined to anal cell and space 2A–3A *H. pseudoherrera*, new species
- 3- Male stigma with yellow microandroconial mass conspicuous without magnification, contrasting with other stigmal elements *H. peruana* (Draudt)
- 3'- Male stigma with microandroconial mass inconspicuous without magnification, appearing black to tan and not contrasting with other stigmal elements 4
- 4- Male with upper element of stigma pocket reduced (Figs. 2a, 2b) 5
- 4'- Male with upper element of stigma pocket well developed (Figs. 1, 3) 6
- 5- Very small (FW 8.5 mm). Forewing rather narrow, with upper element of stigma pocket extending distad from vein Cu2 but not nearly reaching origin of vein Cu1 (Fig. 2a); hind tibia with single pair of spurs *H. shapiro*, new species
- 5'- Medium sized (FW 13 mm). Forewing broad, with upper element of stigma pocket extending distad from a point well above vein Cu2 and nearly or quite reaching vein Cu1 (Fig. 2b); hind tibia with two pairs of spurs *H. galera* Evans
- 6- Male forewing with microandroconial mass of stigma under magnification appearing black *H. pallisteri*, new species
- 6'- Male forewing with microandroconial mass of stigma under magnification appearing gray, tan, or yellowish 7
- 7- Forewing above with broad fuscous border deeply cut by broad fulvous along veins nearly or quite to termen 8
- 7'- Forewing above with fuscous border not deeply cut to termen by fulvous veins, or if deeply cut, narrowly so 10
- 8- Forewing above with pale fulvous postmedian band with inner edge nearly or quite continuously in line with that of subterminal spots. *H. blancasi*, new species
- 8'- Forewing above with inner edge of fulvous postmedian band offset at vein M3 from subterminal fulvous spots 9
- 9- Larger insect (FW 13 mm); forewing broad, not produced; fulvous pale *H. galera* Evans
- 9'- Slightly smaller insect (FW 12 mm); forewing somewhat narrow, slightly produced; fulvous warm, almost orange *H. tentativa*, new species

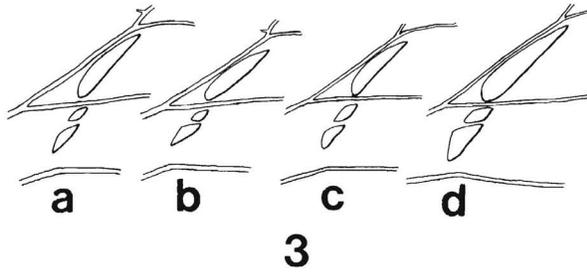


FIG. 3. Diagrams of stigma pockets in males of three species of *Hylephila*. **a**, *H. bouletti*, CHILE, Antofagasta, Tatio, 4360 m, J Herrera, in CAS. **b**, *H. bouletti*, ARGENTINA, Tucumán, Las Animas, Portozuelo de las Animas, 4540 m, I-26-79, (genital dissection # ♂ 5003-JH), in IML. **c**, *H. rossi*, new species holotype, PERÚ, Puno, 10 mi. N. Ayaviri, III-1-51, E. S. Ross & A. E. Michelbacher (genital dissection # ♂ 3821-JH), in CAS. **d**, *H. peruana*, PERÚ, Junín, Pachachaca, 4000 m, V-20-79, G. Lamas, (genital dissection # ♂ 3871-JH), in MUSM.

- 10- Hindwing above with broad fulvous postmedian macular band extending at least into space Rs-M1, fulvous pale to very pale yellowish *H. bouletti* (Mabille)
 10'- Hindwing above with narrow fulvous postmedian macular band not extending beyond spaces M1-M3, fulvous dark, nearly orange *H. rossi*, new species

SUBGROUP I

Hylephila herrerai MacNeill, new species

(Figs. 4a, 12, 26, 32, 33, 58)

Description. Male. Head. Dorsally scaled black with long, golden vestiture. Palpi and antennae missing. **Body,** collar, and patagia as head, dorsally with orange vestiture. Hind leg with two pairs of spurs. **Wings.** Stubby, rounded. Forewing length 9 mm ($n = 1$). Above stigma absent. Fulvous orange in discal cell (divided by longitudinal fuscous streak), narrowly on costa through area of apical spots, broadly and slightly paler postmedially in space M1-M2, narrowly in space M2-M3, then broadly again in spaces M3-Cu1 and Cu1-Cu2, very narrowly in distal half of space Cu2-2A, and a streak in anal cell; these spots outwardly prolonged along veins. Fringes basally fuscous, outer half whitish with very pale fulvous tint. Below fulvous sullied, much more extensive except fuscous in lower half of space Cu2-2A and all of anal cell. Hindwing above brown with abbreviated fulvous postmedian macular band from veins Rs to Cu2 with spot in space M1-M3 more than thrice width of other spots; an extremely narrow, almost obsolete ray-like streak through lower half of discal cell nearly to postmedian macular band in space M1-M3; fuscous border nearly cut to termen by narrow fulvous along veins. Fringes as on forewing but slightly darker. Below broadly orange-fulvous with paler whitish veins scarcely contrasting with fulvous spaces, and reduced black spots basally in lower costal cell, elongate in mid-space Sc-Rs, basal lower half in discal cell, and round-edged postmedial and border spots in spaces Rs-M1, M3-Cu1, and Cu1-Cu2; vannal fold fuscous and expanding into basal half of space Cu2-2A; veins 2A and 3A scarcely pale. Fringes whitish with fulvous tint. **Genitalia.** Eighth tergite (Fig. 4a) with lateral margin only slightly concave before caudal margin; terminal bristle-sockets scarcely enlarged caudad. Valva (Fig. 12) in lateral view with length of basal margin less than or subequal to one and one-half length of valva. Penis proximally not strongly curved dorsad, its length exceeding length of genital capsule but slightly less than twice length of valva; titillators asymmetric, the left large and broadly thorn-like

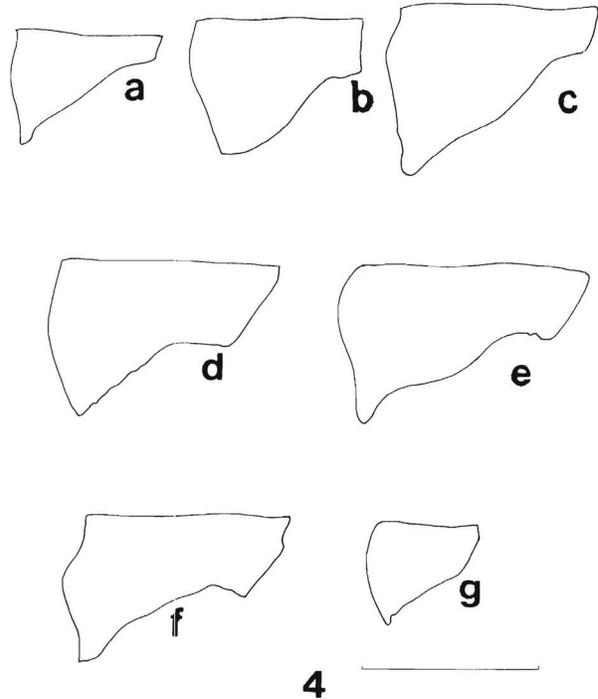


FIG. 4. Eighth tergites in males of five species of *Hylephila* in left lateral view. Scale = 1 mm. **a**, *H. herrerai*, new species holotype, CHILE, Parinacota, "Arica" Cotacotani, 4500 m, II-28-48 (genitalia dissection # ♂ 6117-CDM), in CAS. **b**, *H. pseudoherrerai*, new species holotype, PERÚ, Ayacucho, Reserva Nac. de Pampas Galeras, 4000 m, II-17-78, J. L. Venero (genital dissection # ♂ 3820-JH), in MUSM. **c**, *H. pseudoherrerai*, new species paratype ♂ same data as holotype except date is I-27-78, (genital dissection # ♂ 6311-CDM), in MUSM. **d**, *H. pallisteri*, new species holotype, same specimen as in Fig. 1a. **e**, *H. pallisteri*, same specimen as in Fig. 1b. **f**, *H. tentativa*, new species holotype, same specimen as in Fig. 1d. **g**, *H. shapiro*, new species holotype, same specimen as in Fig. 2a.

and sclerotically strapped to penis, the right narrowly thorn-like and not sclerotically strapped to penis; cornuti asymmetric, the proximal large and bidentate. the distal evidently fragmented into two subequal, slender, unidentate thorns. Juxta with ventral caudal clefts about one-half length of juxta; separated median floor not nearly reaching caudal margin of juxta. Uncus in dorsal view somewhat rounded cephalad, gradually emarginate to pectines caudad; caudal cleft scarcely exceeding pectines cephalad; pectines minute, not anteriorly rounded, each half broader than long, clearly arched in lateral view, the tines in dorsal view obscure, many, and scarcely separated. Gnathos in lateral view dorsally distinctly sclerotized, not exceeding pectines caudad, and greatly divergent ventrally from uncus.

Female. Head and body as male. Antennal club large, about three-fourths length of shaft, club posteriorly black with scattered golden scales, anteriorly and below buffy, golden above; nudum brown, less than one-fourth length of club, shaft buff. Palpi with second segment shaggy with mixed orange and black, long, hair-like scales exceeding length of third segment which is scaled black and orange. Eyelash greater than one-half eye diameter, orange, and black scaled. Collar and patagia dorsally orange scaled with emergent, scattered, long, hair-like, black scales. **Wings.** Somewhat more produced and apically pointed than male (Fig. 33). Forewing length 10 mm ($n = 1$). Above as male but fuscous markings more extensive

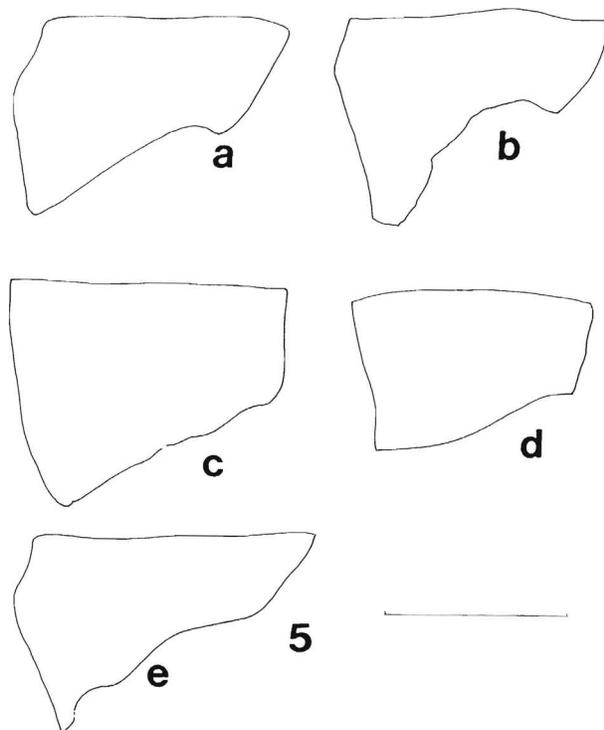


FIG. 5. Eighth tergites in males of three species of *Hylephila* in left lateral view. Scale = 1 mm. **a**, *H. galera*?, same specimen as in Fig. 2c. **b**, *H. galera*?, same specimen as in Fig. 2d. **c**, *H. bouletti*, CHILE, Antofagasta, Salar Aguas Calientes, 4000 m, II-27-60, L. Peña (genital dissection # ♂ 6125-CDM), in AME. **d**, *H. bouletti*, ARGENTINA, Catamarca, Quebrada de los Cazadores, grupo austral Nevadas del Aconquija, 5400–4800 m, XI-23-48, M. Lamb (genital dissection # ♂ 6213-CDM), in CAS. **e**, *H. peruana*, same specimen as in Fig. 3d.

in costal cell; below as male but fuscous marginal wedge-shaped spots more prominent from space M1–M2 to space R4–R5 where otherwise inconspicuous pale veins are conspicuous to termen. Hindwing above as male, fulvous increased discally in lower distal half of discal cell continuing ray-like through spaces M1–M3 and in lower half of spaces Cu2–2A and 2A–3A; below as male but with broadly scaled white veins more prominent, fuscous spots reduced. Fringes whitish with fulvous tint vannally. **Genitalia.** (Fig. 26). Eighth sternite not sclerotized. Apophysis anterioris in lateral view scarcely produced cephalad of junction with lamella postvaginalis. Lamella postvaginalis in ventral view broadly medially united, each half produced ventro-cephalad forming an anterior bulge not nipple-like, medially produced ventrad into a narrow, double-folded, U-shaped flange just caudad of the mostly membranous antrum. Antrum caudodorsally weakly and irregularly sclerotized, anterodorsally weakly sclerotized immediately caudad of ductal constriction. Ductus bursae weakly sclerotized laterally, ventrally mostly membranous, left lateral pocket not produced.

Types. Holotype ♂, CHILE, "Arica," Parinacota, Cotacotani, 4500 m, II-28-48 (genital dissection # ♂ 6117-CDM), in CAS. Paratype. 1 ♀, same data as holotype but additional determination label by K. J. Hayward as *Hylephila phylaeus basistrigata* Eaton. (genital dissection # ♀ 6118-CDM), in CAS.

Etymology. With considerable pleasure I name this species for my good friend, the late Prof. José Valentín Herrera G., to whom

this paper is dedicated. Pepe Herrera devoted well over four decades to the collection and study of Chilean Lepidoptera. He was actively involved with this study of *Hylephila* and co-authored our first paper on this genus.

Diagnosis and discussion. This species is distinguished by its small size, lack of a stigma in the male, and the broadly darkened vannal area above. It differs from males of *H. pseudoherrerai* in its smaller size, darker wing markings, and in genitalic details of the uncus, pectines, and juxta. The female genitalia most resemble those of *H. tentativa* in the lack of a sclerotized eighth sternite, but the very short apophyses anteriores, and weakly sclerotized, short ductus bursae differ from these structures in *H. tentativa*. The wing borders are not as broadly cut by fulvous along the veins as are those of *H. tentativa*. The species flies in February.

***Hylephila pseudoherrerai* MacNeill,
new species**

(Figs. 4b, 4c, 13, 14, 34, 35, 58)

Description. Male. Head. Dorsally dark, black and golden scaling mixed equally, except for pale golden patch over eye behind black eyelash. Antennae with club black posteriorly, anteriorly buff merging to golden above, club about one-half length of shaft, nudum dark brown, about one-fourth length of club. Palpi golden, second segment somewhat shaggy, long, black, hair-like scales restricted to anterolateral angles, third segment dorsally black, scarcely emerging from vestiture of second segment. **Body.** Dorsally black with long, golden, hair-like overscaling, except for pale golden patagia and pale margins of otherwise black tegulae. Hind tibia with two pairs of spurs. **Wings.** Narrow and rounded to somewhat rounded at tornus. Forewing length, holotype 11 mm, one paratype 12 mm. Above stigma absent. Fulvous rich to cold orange costad of discal cell merging with apical spots (but sullied basad), in discal cell (where divided by broad, blackish fuscous streak from base to end cell where connected broadly to elongate black spot between end cell and subterminal spots), and below cell in base of space Cu1–Cu2, in subterminal spots and in postmedian band from spaces M3–Cu1 to Cu2–2A, where sullied, and in most of cell where also sullied. Fuscous border broad, only slightly cut by fulvous veins. Fringes brownish, at tornus sullied fulvous. Below costad, apically on veins, and distally on fringes, whitish. Hindwings above with fulvous somewhat restricted to a ray in distal half of cell through spaces M1–M3 to broad, fuscous border, in cell Cu2–2A from near base nearly or quite to margin, and narrowly as part of the postmedian macular band in spaces Cu1–Cu2 and M3–Cu1, and scarcely evident in space Rs–M1; fuscous border broad, scarcely cut by fulvous veins. Fringes pale fulvous to vannally fulvous and apically fuscous. Below, extensively pale fulvous with contrasting white veins Sc to Cu2; black spots basally in costal cell, discal cell, and ray-like from base to margin in space 2A–3A and anal cell, postmedially near base of spaces Rs–M1, M3–Cu1, and Cu1–Cu2, indistinctly and ray-like in Sc+R1–Rs, marginally in spaces Rs–M1, M3–Cu1, and Cu1–Cu2. Fringes slightly paler than above with a slight violet tint. **Genitalia.** Eighth tergite (Figs. 4b, 4c) lateral margins slightly emarginate before caudal margin; terminal bristle-sockets slightly enlarged before caudal margin. Valva (Figs. 13, 14) narrow, in lateral view with length of basal margin more than (or slightly less than) one and one-

half depth of valva. Penis strongly curved dorsad anteriorly (or straight), its length exceeding length of capsule and subequal to twice length of valva; titillators sclerotically strapped to penis, slightly asymmetric, the left more robust than the right, thorn-like with its point (more or less) angled ninety degrees from its base, cornuti bidentate, slightly asymmetric. Juxta with ventrocaudal clefts about one-half length of juxta, the separated median floor nearly reaching caudal margin of juxta. Uncus in dorsal view greatly expanded and rounded cephalad, then abruptly emarginate caudad, or smoothly tapered, to pectines; caudal cleft distinctly exceeding pectines cephalad; pectines small, each half broader than long, not anteriorly rounded, the tines conspicuous, few; in lateral view somewhat arched. Gnathos in lateral view dorsally distinctly sclerotized, not to slightly exceeding pectines caudad, and greatly to somewhat divergent ventrad from uncus.

Female. Unknown.

Type. Holotype ♂, PERÚ, Ayacucho, Reserva Nac[ional] de Pampas Galeras, 4000 m, 17-II-78, J. L. Venero (genital dissection # ♂ 3820-JH), in the Museo Nacional de Historia Natural, Perú (MUSM). Paratypes. 1 ♂, same locality and collector as holotype, but 27-I-78, (genital dissection # ♂ 6311-CDM); 1 ♂, same locality but date 21-IV-74 and G. Lamas, collector (genital dissection # ♂ 3736-JH). Paratypes will be placed in MUSM and CAS.

Etymology. This species, while small and without a male stigma, is not the same species as *H. herrerae*.

Diagnosis and discussion. The holotype has narrower wings and is more orange than one paratype. The latter is larger, paler, and looks very much like a female of *H. bouletti*, which I thought it was until I dissected it. The genitalia are slightly different in the type and one paratype; those of the paratype (# ♂ 6311-CDM) somewhat resemble those of *H. herrerae*, but the locality data and the contrasting white veins on the hindwing venter suggest that all three specimens are samples of the same population. *Hylephila herrerae* is smaller with broader fuscous markings above and lacks contrasting white veins below, and the genitalia of *H. herrerae* differ in the narrower uncus, smaller pectines with inconspicuous tines, and a shorter juxtal median floor. The species has been collected in January, February, and April.

Hylephila pallisteri MacNeill, new species

(Figs. 1a, 1b, 4d, 4e, 15, 16, 36, 37, 58)

Description. Male. Head. Dorsally scaled orange fulvous; eyelash black with scattered orange hairs. Antennae with club anteriorly and above orange, merging to white below, posteriorly black; nudum orange shading to brown on apiculus; shaft length more than twice length of club. Palpi with third segment protruding above vestiture of second segment; second segment vestiture black above and on distal third below, lateral scales orange blending to white, hair-like scales anteriorly orange, but at anterolateral angles black. **Body,** patagia, and collar as head, dorsally with orange vestiture. Hind legs with two pairs of spurs. **Wings.** Broad. Forewing length 11 mm (second specimen 14 mm) (n = 2). Above stigma present, slender; microandroconial mass black, inconspicuous amid other black stigmal elements; post-stigmal patch conspicuous, broad. Orange fulvous discally greatly reduced by broad fuscous border scalloped along veins, but broadly orange in costal and subcostal spaces from base

nearly to subapical fulvous spots, and through entire discal cell except where divided longitudinally by slender fuscous streak; narrow subterminal spots distinctly offset from only slightly broader postmedian macular band. Fringes broadly fuscous, terminally pale fulvous. Below, stigma pocket upper element extends well beyond origin of vein Cu1 and diverges from discal cell about equidistant from origins of veins Cu1 and Cu2, lower elements large (Figs. 1a, 1b). Orange fulvous as above but broader discally and more restricted basad by fuscous in spaces Sc-R, basal half of Cu2-2A, discal cell, and entire anal cell; costa white and veins R3 to M2 distally white, black bar end discal cell and fuscous spots postmedially in spaces M1-M2, M2-M3, and M3-Cu1 more or less heavily overscaled with fulvous, and distal to stigma pocket in spaces Cu1-Cu2 and Cu2-2a. Hindwing above fuscous, fulvous restricted to streak through lower half of discal cell and a very narrow postmedian macular band Cu2-2A to crescent in Rs-M1, and weakly along vein 2A to termen, fringes as forewing but more orange. Below fulvous with veins (except M2) from Cu1 to Sc strongly contrasting white; rounded black spots basally in costal and discal cells, postmedially and marginally in spaces Sc-Rs, Rs-M1, M3-Cu1, Cu1-Cu2, and discally in upper half of discal cell; space Cu2-2A fulvous from base to termen, vein 3A distal two-thirds fulvous; fringes more orange than above. **Genitalia.** Eighth tergite with lateral margin broadly emarginate before caudal margin (Figs. 4d, 4e), terminal bristle-sockets enlarged just before caudal margin. Valva (Figs. 15, 16) in lateral view narrow, basal margin not strongly convex, its length subequal to one and one-half times depth of valva, dorsal margin not greatly concave to caudal beak; in caudal view lower half of horizontal cleft narrow, scarcely one-half width of knobbed upper half. Penis proximally slightly curved dorsad, its length exceeding length of genital capsule and about twice length of valva; titillators asymmetric, the left large, broadly thorn-like, and sclerotically strapped to penis, the right much reduced, narrowly thorn-like, and obscurely strapped to penis; cornuti bidentate, asymmetric, the proximal basally much elongate, the distal not elongate. Juxta with ventrocaudal clefts short, about one-fourth length of juxta; separated median floor reaching caudal margin of juxta. Uncus in dorsal view distinctly round cephalad, abruptly tapered to caudal pectines; the caudal cleft not exceeding pectines cephalad; pectines small, each half longer than broad, anteriorly and posteriorly rounded, the tines few, conspicuous, in lateral view scarcely arched. Gnathos in lateral view dorsally clearly sclerotized, not exceeding pectines caudad, and greatly divergent ventrad from uncus.

Female. Unknown.

Type. Holotype ♂, PERÚ, Cuzco, Ollantaitambo, III-24-47, 9200 ft., C. J. Pallister (genital dissection # ♂ 3811-JH), in AMNH.

Etymology. This species is named for the collector of the holotype, C. J. Pallister.

Diagnosis and discussion. Two additional specimens have been seen. One, a male from Yungas (or LaPaz) Bolivia, 1000 m, ex H. Rolle, 1902, R. Oberthur Coll'n. (genital dissection # ♂ 3815-JH) was prematurely returned to the BMNH identified as *H. bouletti*, but was noted as having identical genitalia to specimen # ♂ 3811-JH (the holotype of *H. pallisteri*). I have not examined this specimen in detail.

A more recent specimen (Figs. 1b, 4e, 16, 37, 58) from PERÚ, Cuzco, Abra Acjanacu, 3600 m. 17-V-84, ♂. Lamas (genital dissection # ♂ 6227-CDM), in MUSM, seems to be this species; but it differs in sev-

eral particulars from the holotype: It is much larger with a forewing length of 14 mm. The antennal club is longer so the shaft is about twice the length of the club. The third palpal segment is ventrally entirely fulvous, not black on the distal third. On the wings above the post-stigmal patch is not as broad as in the holotype, and below the stigmal pockets are more robust. The markings are quite similar; but on the hindwing venter there is an extra elongate postmedian black spot in the upper fourth of space M1–M3, and vein M2 is apparent and whitened. The genitalia also differ in that the valva is a bit narrower with the length of the basal margin more than one and one-half times the depth, and the lower one-half of the horizontal beak cleft in caudal view is nearly as wide as the upper half. The penis is not as strongly bent dorsad proximally, and the discal cornutus is unidentate. The juxta has the ventrocaudal clefts long, about half the length of the juxta. The uncus in dorsal view has the lateral margin more abruptly emarginate caudad before the pectines and the caudal cleft distinctly exceeding the pectines cephalad. The pectines are small with each half scarcely longer than broad, and anteriorly as well as posteriorly scarcely rounded, and the tines are numerous and inconspicuous. The gnathos in lateral view is only somewhat divergent ventrally from the uncus. These characters suggest that perhaps this specimen represents a closely related species.

The two specimens are distinctive in the orange fulvous above with broad borders, the very black stigmal elements including the microandroconial mass, and the dark fuscous, orange fulvous, and contrasting white veins below. The specimens were collected in March and May.

Hylephila blancasi MacNeill, new species

(Figs. 1c, 6, 9, 17, 38, 39, 58)

Description. Male. Head. Dorsally pale fulvous. Antennal club anteriorly and above orange fading to pale buff below, posteriorly black; nudum pale brown; shaft slightly longer than twice length of club. Palpi shaggy, pale fulvous, second segment front has hair-like scales pale, anterolateral angles black, laterally scales pale, not hair-like, third segment dorsally black, scarcely emerging from vestiture of second segment. **Body** dorsally black with long, pale, golden, hair-like overscaling, except for golden patagia and margins of otherwise black tegulae. Hind tibiae with two pairs of spurs. **Wings.** Forewing produced, length 12 mm (range 11–13 mm) ($n = 5$). Above stigma present; microandroconial mass dark gray, inconspicuous; post-stigmal patch narrow. Fulvous extensive from costa through discal cell, basally sullied, a short black streak dividing distal half and an oblique black line at end of discal cell; fuscous border divided to termen by fulvous along veins; inner edge of subterminal fulvous spots usually in line with inner edge of postmedian macular band. Below, stigma pocket upper element extends just beyond origin of vein Cu1, diverges from discal cell cubitus vein much nearer to origin of vein Cu1 than Cu2, and reaches vein Cu2, lower ele-

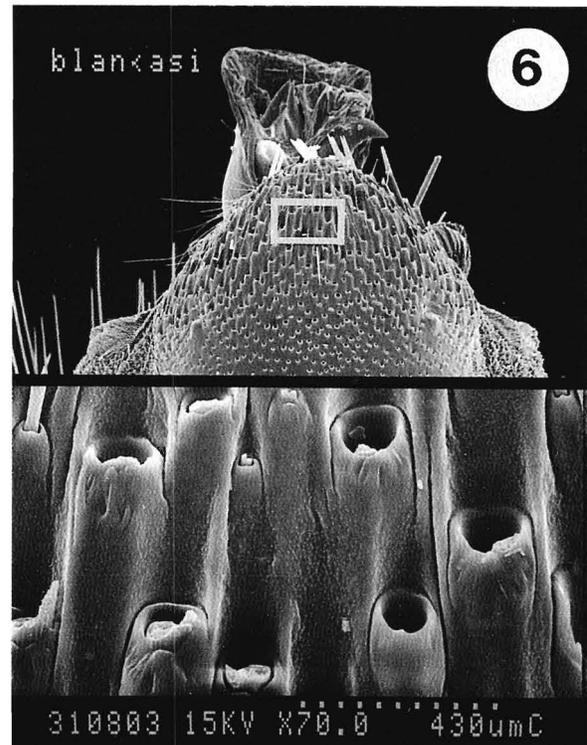


FIG. 6. SEM image of male eighth tergite (dorsal aspect) of *H. blancasi*, new species paratype (descaled to show caudal array of bristle-sockets at 70 \times , with inset enlarged below). [PERÚ, Lima] cerca (sic) Canta, 4700 m, XII-13-47, Coll. Blancas (SEM #9, 23-CDM), in CAS.

ments very large (Fig. 1c); costa whitened (gray where worn) and veins Rs to M3 buff distally (clearly white in two paratypes); extensive fulvous pale, obscuring subapical fulvous spots; discal cell, costal cell, and space Sc–R all black at base, as is basal half of space Cu2–2A and all of anal cell; marginal fuscous spots isolated by pale fulvous along veins to termen, that in space M1–M2 nearly obsolete; diagonal black bar at end of discal cell, fuscous postmedian spots in spaces Cu1–Cu2, M1–M2, and M2–M3, the latter two heavily overscaled fulvous. Hindwings above with costal cell and space Sc–Rs fuscous, fuscous border nearly or quite divided to termen by fulvous extensions along veins, fulvous of space M1–M3 a ray-like extension well into discal cell, fuscous basal half of postmedian spaces Cu2–2A, Cu1–Cu2, and discal cell all heavily overscaled with fulvous; postmedian fulvous spot in space Rs–M1 an angular crescent, the upper half twice as wide as lower half. Below pale fulvous restricted by white scaling very broadly along side of veins Rs to Cu2, but scales of veins M3, Cu1, and Cu2 light brownish, contrasting with whitish to pale fulvous intervein spaces (one paratype has thin white streak mid fulvous of space Cu2–2A), space 2A–3A and anal cell wholly fuscous, vein 1A a thin fulvous streak, basal and post-medial black spots edged or partly overscaled by cupreous scales or hairs. Fringes dusky, vannally pale orange. One paratype (# δ 3819-JH) has fulvous extensive and dark markings much reduced like *H. galera* and forewing subterminal fulvous spots in spaces M1–M2 and M2–M3 slightly offset from postmedian band spots in spaces M3–Cu2 to Cu2–2A owing to fulvous expanded basad in M3–Cu1. Another paratype (SEM # δ 23-CDM) has more extensive dark

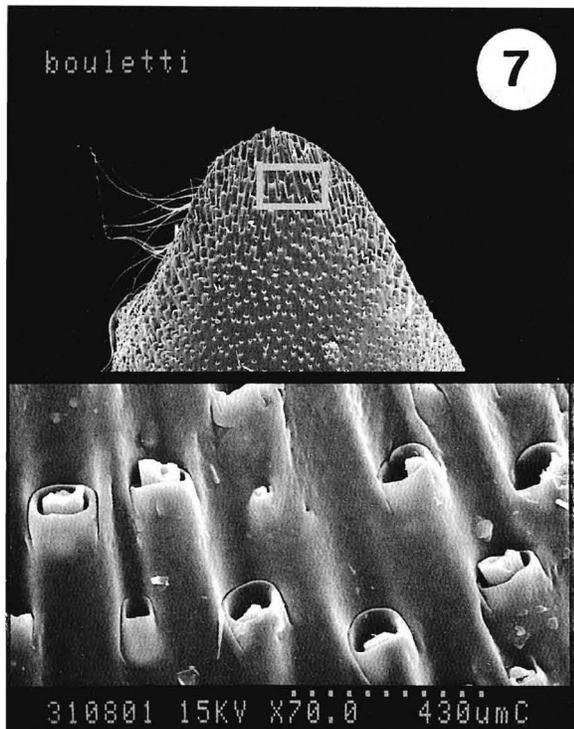


FIG. 7 SEM image of male eighth tergite (dorsal aspect) of *H. bouletti* (descaled to show caudal array of bristle-sockets at 70 \times with inset enlarged below). CHILE, Parinacota, nr. base Vol. Guallatire, 4500 m, XI-21-94, A. M. Shapiro (SEM #7-CDM), in CAS.

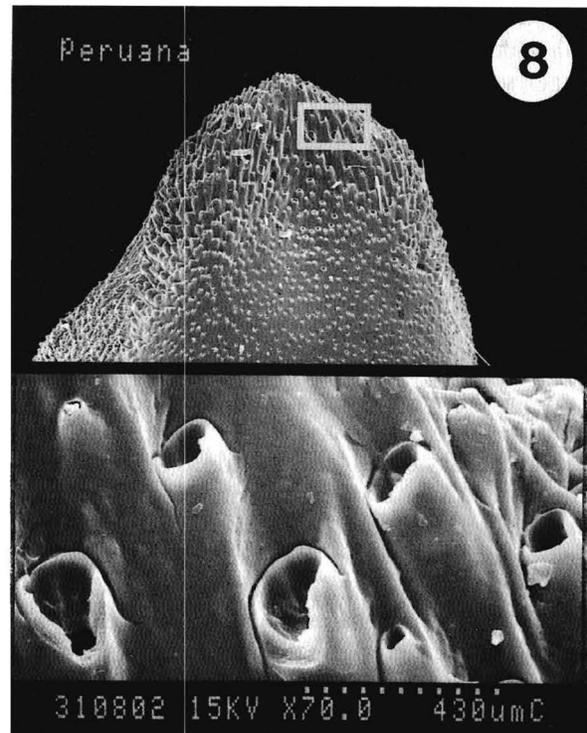


FIG. 8 SEM image of male eighth tergite (dorsal aspect) of *H. peruana* (descaled to show caudal array of bristle-sockets at 70 \times , with inset enlarged below). PERÚ, Junín, Pachachaca, 4000 m, V-20-79, G. Lamas (SEM #8-CDM), in MUSM.

markings above so the fulvous subterminal spots are not only offset but completely separated from the fulvous postmedian band. **Genitalia.** Eighth tergite with lateral margin distinctly emarginate before caudal margin, terminal bristle-sockets conspicuously enlarged caudad, more or less rounded in cross section (Fig. 6). Valva (Fig. 17) in lateral view broad, with ventral margin strongly convex but distad abruptly concave to a prominent beak; dorsal margin basally abruptly concave to the caudal beak, length basal margin slightly greater than one and one-half times depth of valva. Penis proximally scarcely (or not) curved dorsad, its length exceeding length of genital capsule and greater than twice length of valva; titillators nearly symmetric, broadly based, thorn-like, and sclerotically strapped to penis, the right slightly reduced; cornuti asymmetric, bidentate, one much more broadly elongate. Juxta with ventral caudal clefts long, about one-half length of juxta, separated median floor scarcely reaching caudal margin of juxta. Uncus in dorsal view with distinctly rounded cephalic and lateral margins, then emarginate and abruptly tapered, without serrations, to caudal pectines, the caudal cleft not (or slightly) exceeding pectines cephalad; pectines minute (Fig. 9), each half about as long as broad, anteriorly and posteriorly not, to somewhat, rounded, the tines many, inconspicuous, somewhat arched in lateral view. Gnathos massive in lateral view, dorsally distinctly sclerotized, not exceeding pectines caudad, and greatly divergent ventrally from uncus.

Female. Unknown.

Type. Holotype σ , PERÚ, Santia, donated 1902, P. forte [sic] (genitalia dissection # σ 3873-JH), in AMNH. Paratypes. 1 σ , [PERÚ, Lima] cerca Canta, 4700 m, 13-XII-47, Coll. Blancas (SEM # σ 9, 23-CDM); 1 σ , [PERÚ, Junín] entre La Oroya Tilarniuc, 10-I-49, Coll. Blancas (genitalia dissection # σ 3819-JH); 1 σ , [PERÚ]

#22694, E. E. Olcott (genitalia dissection # σ 3874-JH); 1 σ , [PERÚ] illegible locality, Huanuco, Holland Collection (genitalia dissection # σ 6280-CDM). Paratypes will be placed in the following collections: AMNH, CAS, CMNH.

Etymology. This species is named for the collector of the first two specimens I saw of this species. The holotype was selected because it is in better condition.

Diagnosis and discussion. *Hylephila blancasi* has superficial markings similar to those of *H. galera*. One paratype (genitalia dissection # σ 3819-JH) is very like the latter with pale fulvous extensive on the dorsal forewing, the dark markings much reduced, and the forewing subterminal fulvous spots in spaces M1-M2 and M2-M3 slightly offset from the postmedian band of fulvous spots from M3-Cu1 to Cu2-2A, owing to the fulvous expanded basad in space M3-Cu1. *Hylephila galera*, however, has much broader wings and genitally belongs with subgroup II. Another paratype of *H. blancasi* (SEM # σ 9, 23-CDM) has the dorsal forewing subterminal spots reduced and completely separated from a narrowed postmedian band by a combination of a distally expanded subapical fulvous spot and a greatly broadened marginal border. *Hylephila blancasi* flies in December and January.

The following species, *H. tentativa*, is remarkably similar to *H. blancasi*; but the fulvous of the wing

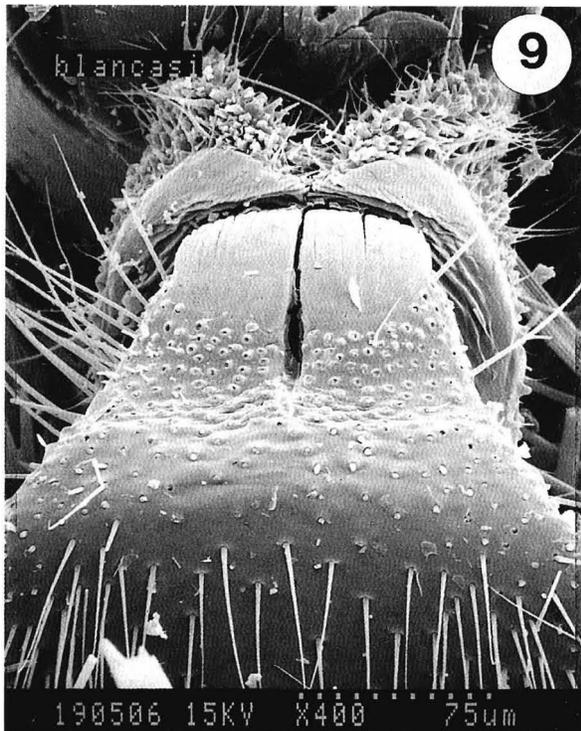


FIG. 9. SEM image of caudal tip of uncus (dorsal aspect) of male *H. blancasi* showing pectines at 400 \times . Same specimen as Fig. 6 (SEM #9, 23-CDM), in CAS.

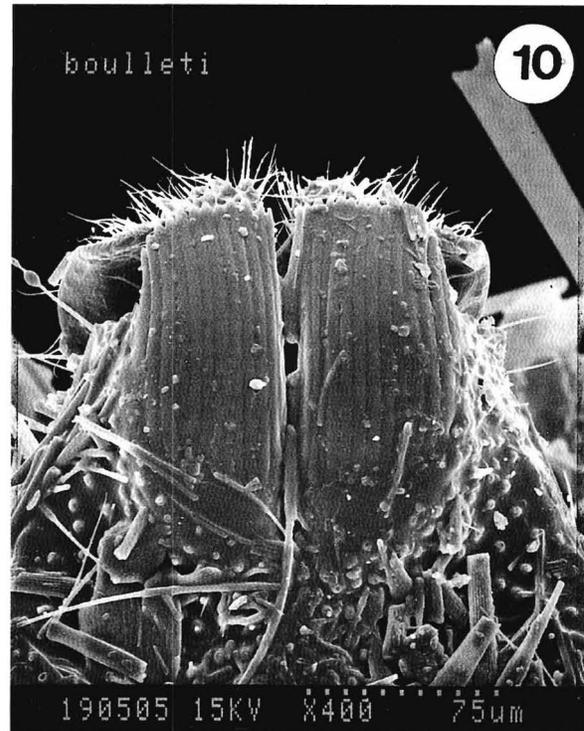


FIG. 10. SEM image of caudal tip of uncus (dorsal aspect) of male *H. bouletti* showing pectines at 400 \times . CHILE, Parinacota, Reserv. Nac. Salar de Surire, no. shore, 4250 m, XI-22-94, A. M Shapiro (SEM #22-CDM), in CAS.

above is much more orange on *H. tentativa*, the male stigma is less well developed, and the genitalia are somewhat different. The valva of *H. blancasi* is much broader, the titillators are more robust and the cornuti distinctly bidentate, the juxta is less robust, the uncus in dorsal view is anteriorly more rounded and the pectines slightly larger with numerous, inconspicuous tines, and the gnathos is caudally more or less inconspicuous from above than are these structures in *H. tentativa*.

Hylephila tentativa MacNeill, new species

(Figs. 1d, 4f, 18, 27, 40, 41, 58)

Description. Male. Head. Dorsally black with mixed golden and black hair-like vestiture. Antennae dorsally black on club, black mixed with white scales on shaft, anteriorly golden on club and shaft fading to buff basally; club less than one-half length of shaft, nudum pale brown; shaft length slightly greater than dorsal width of head. Palpi shaggy; third segment black, slightly protruding anteriorly from vestiture of second segment in dorsal view, in lateral and ventral views scarcely protruding from rich, golden, fulvous, hair-like vestiture of front of second segment. Eyelash length about one-half eye diameter. **Body** dorsally black with sparse golden, hair-like scales. Tegulae black with broad, pale edges. Legs with hind tibiae bearing two pairs of spurs. **Wings.** Somewhat narrow, slightly produced. Forewing length 12 mm ($n = 1$). Above stigma present, evident but not conspicuous; microandroconial mass very narrow, scarcely distinguishable between very abbreviated brush patches.

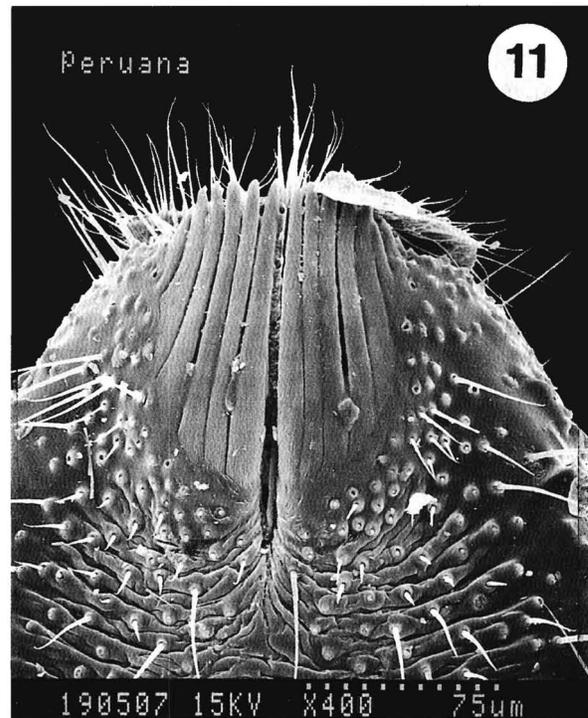


FIG. 11. SEM image of caudal tip of uncus (dorsal aspect) of male *H. peruana* showing pectines at 400 \times . PERÚ, Podocayo, Feb.-May 1925 (SEM #24-CDM), in LACM.

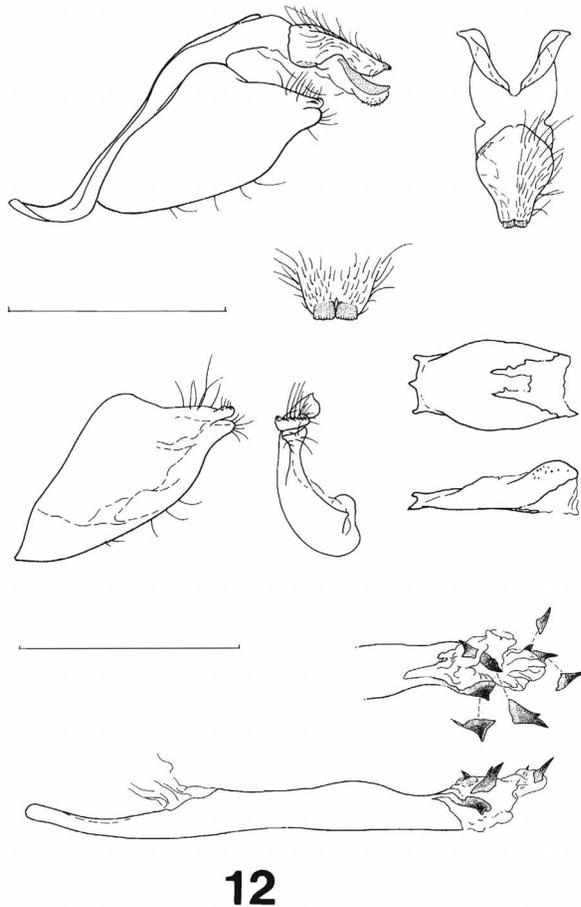


FIG. 12. Male genitalia of *H. herrerae*, new species holotype. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted (left lateral and distal dorsal aspects). Data as Fig. 4a. Scale = 1 mm.

post-stigmal patch narrow but most conspicuous stigmal element. Fulvous warm, ruddy, almost orange, abruptly contrasting with fuscous markings; border cut to termen by fulvous along veins. Inner edge of fulvous subterminal spots not in line with inner edge of postmedian macular band. Fringes basally fuscous, terminally buffy orange. Below, rich fulvous more extensive, fuscous markings reduced, veins R5, M1, and M2 whitened as is the costa from base to apex. Stigma pocket with upper element very narrow, its width scarcely twice diameter of adjacent cubitus vein, lower elements reduced, widely separated. Hindwing above with rich fulvous postmedian macular band from spaces R5–M1 to Cu1–Cu2, and fulvous rays from base discal cell to margin in space M1–M3 and near base to margin in Cu2–2A; fuscous border cut to termen by fulvous along veins. Below fulvous somewhat paler but not nearly whitish, fuscous spots broadly separated by fulvous flanking the whitened veins from Rs to Cu2, space Cu2–2A from base to termen all fulvous, a poorly defined, narrow, pale ray from near base to termen along vein 3A in otherwise fuscous vannal area. **Genitalia.** Eighth tergite (Fig. 4f) laterally conspicuously emarginate immediately cephalad of caudal margin; terminal bristle-sockets conspicuously enlarged caudad. Valva (Fig. 18) in lateral view narrow, length basal margin distinctly more than one and one-half times valva depth, dorsal margin some-

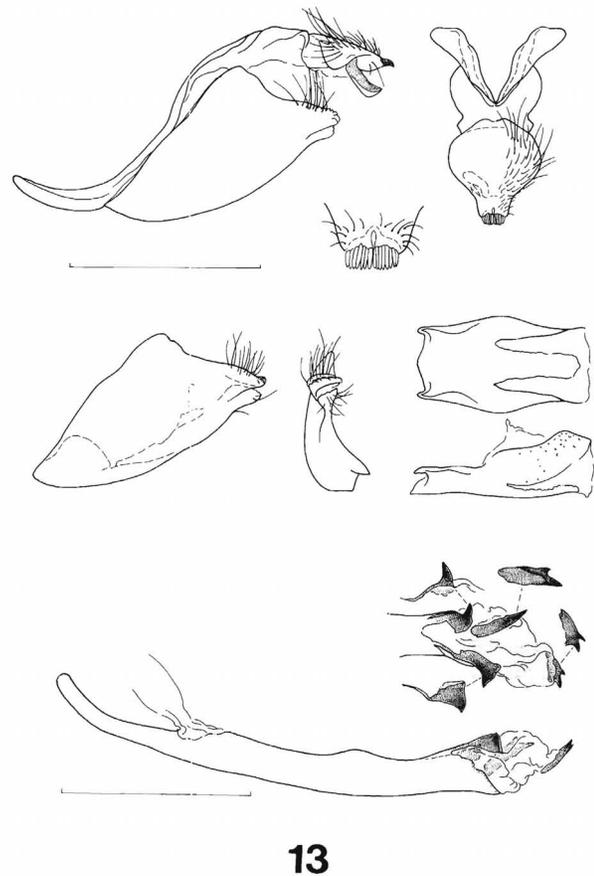
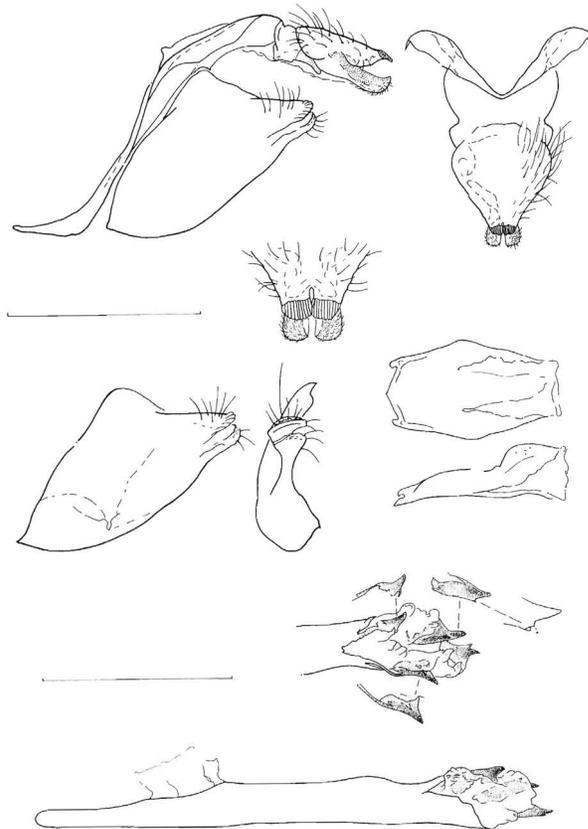


FIG. 13. Male genitalia of *H. pseudoherrerae*, new species holotype. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted (left lateral and distal dorsal aspects). Data as Fig. 4b. Scale = 1 mm.

what concave, caudal beak not prominent. Penis about twice length of valva; titillators sclerotically strapped to penis, slender, thorn-like, asymmetric, the left basally much more massive than the right; cornuti asymmetric, one bidentate and basally massive, the other smaller and minutely tridentate. Juxta with ventral caudal clefts about one-half length of juxta and separated mid-ventral floor nearly reaching caudal margin of juxta. Uncus in dorsal view more or less triangular, cephalic margin somewhat convex, and lateral margins from cephalic lateral angles only slightly sinuate and tapered to pectines, caudal cleft distinctly exceeding the pectines cephalad; pectines minute, not anteriorly rounded, each half longer than broad, the tines few, conspicuous, in lateral view scarcely arched. Gnathos massive, sclerotized, projecting caudad well beyond pectines in dorsal view, divergent from uncus in lateral view.

Female. Head and body as male but fulvous paler, cheeks and eye ring white. Antennal club slightly less than one-half length of shaft, club black, posteriorly buffy, anteriorly and below, not checkered on shaft; nudum brown, slightly less than one-half length of club. Palpi second segment shaggy, pale to buffy fulvous, black hair-like scales restricted to anterolateral angle. Eyelash about one-half eye diameter. Patagia dorsally fulvous. **Wings.** Somewhat produced and apically pointed. Forewing length 12.5 mm ($n = 1$). Above as male, fulvous paler, less ruddy, fuscous of discal "false stigma" more

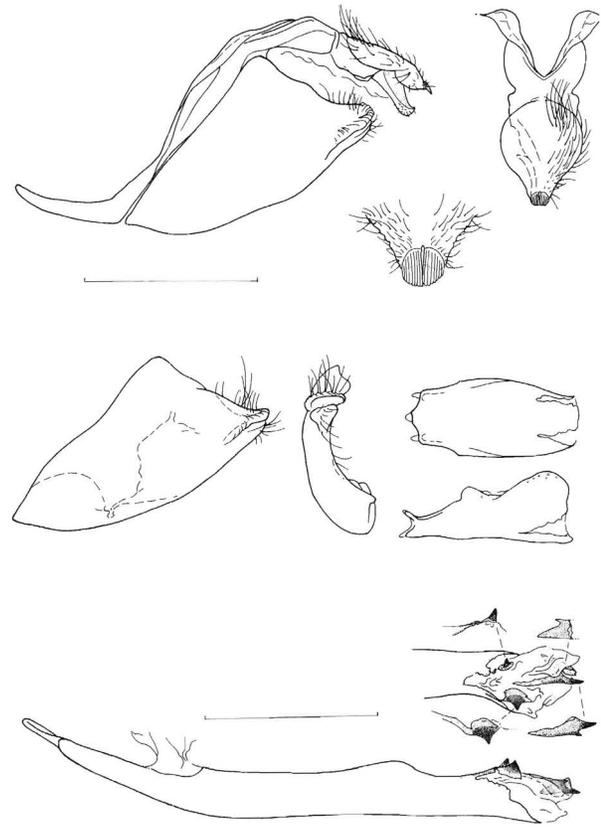


14

FIG. 14. Male genitalia of *H. pseudoherrerai*, new species, paratype. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted, (left lateral and distal dorsal aspects). Same specimen as in Fig. 4c. Scale = 1 mm.

extensive than male, border sharply cut to termen along veins from M1 to 2A, inner edge of subterminal fulvous spots not in line with inner edge of postmedian band; termen fuscous; fringes basally fuscous, terminally paler except apically. Below pale fulvous as male but veins less whitened. Hindwing above as male but fulvous less ruddy. Below as male but fuscous markings slightly broader; termen fuscous; fringes basally fuscous, terminally buffy. **Genitalia.** (Fig. 27). Eighth sternite not sclerotized. Apophysis anterioris in lateral view produced cephalad of junction with lamella postvaginalis, its length subequal to sclerotized dorso-ventral width of papillae anales. Lamella postvaginalis in ventral view medially united, anteriorly produced ventrad into a double-folded U-shaped flange, medially sclerotically extended cephalad toward dorsal portion of antrum. Antrum dorsally and anterolaterally well sclerotized, ventrally darkened, plicate-membranous. Ductus bursae well sclerotized, left lateral pocket clearly produced.

Types. Holotype ♂ PERÚ, Ay[acucho], Apacheta de Tambo, 4250 m, 12°59'S, 74°05'W, 29-I-99, G. Lamas (genital dissection # ♂ 6308-CDM), in MUSM. Paratype 1 ♀ PERÚ, Ay[acucho], Rio Apacheta, 4200 m, 13°21'S, 74°39'W, 24-I-99, G. Lamas (genital dissection # ♀ 6309-CDM), in MUSM.



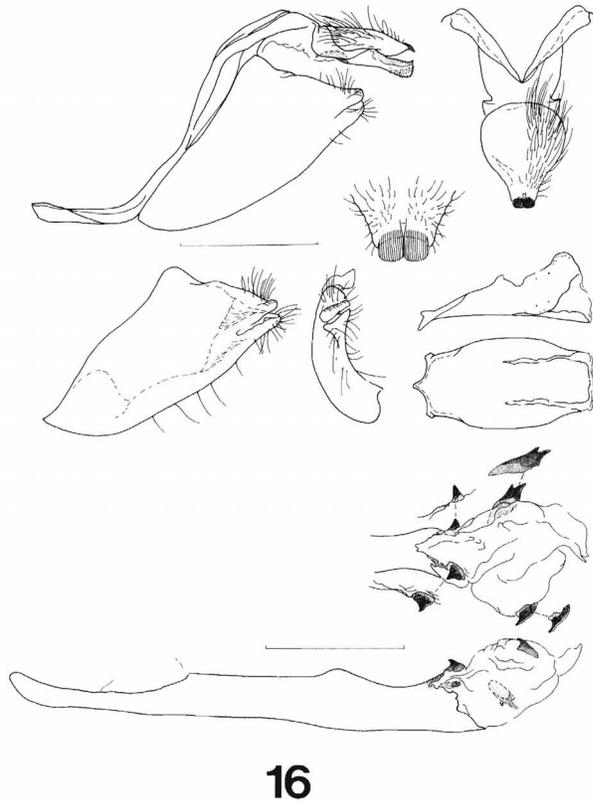
15

FIG. 15. Male genitalia of *H. pallisteri*, new species holotype. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted, (left lateral and distal dorsal aspects). Data as Fig. 1a. Scale = 1 mm.

Etymology. The specific name reflects the uncertainty expressed in the discussion below.

Diagnosis and discussion. As mentioned, this species is remarkably like *H. blancasi*; in fact when I first saw this pair of specimens I was convinced they were that species. I was surprised by the apparent disjunction of this population from the rather more northern ones of the known *H. blancasi*. In comparing seemingly slight differences in color pattern, stigmal characters, and especially genitalia, I suspected that this was not *H. blancasi*; and since this pair seems to be a male and a female from the same population, I elected to emphasize this, but not without some hesitation—hence the name. The types were collected in January.

The differences from *H. blancasi* in the male genitalia are discussed under that species. The female genitalia resemble those of *H. herrerae* in lacking a sclerotized eighth sternite, but they differ from those of that



16

FIG. 16. Male genitalia of *H. pallisteri?* Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted (left lateral and distal dorsal aspects). Same specimen as in Fig. 1b. Scale = 1 mm.

species in the length of the apophysis anterioris and in the clearly produced lateral pocket of the ductus bursae. There is scarcely any resemblance to that species superficially.

SUBGROUP II

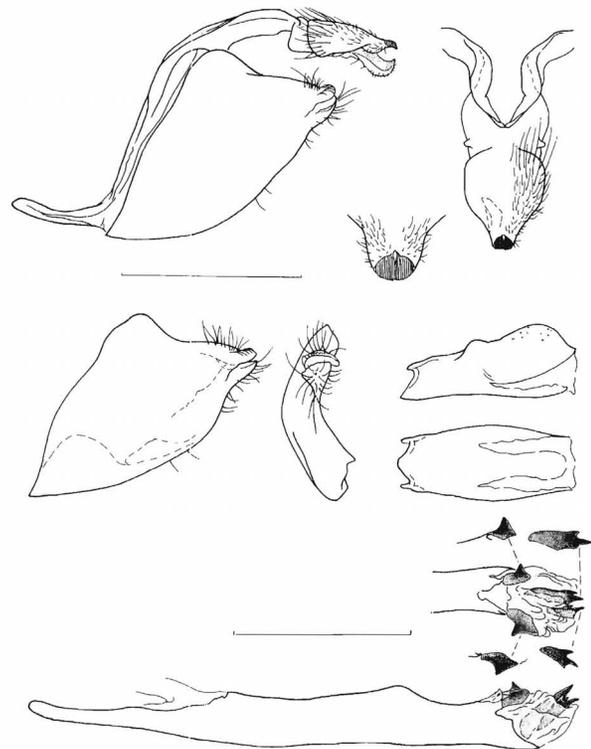
Hylephila shapiro MacNeill, new species

(Figs. 2a, 4g, 19, 42, 58)

Hylephila ? *n. sp.*, cf. *boulleti* group, Shapiro, 1985.

Stud. Neotrop. Fauna and Environ. 20: 9, 10, figs. 5(3), 6(3).

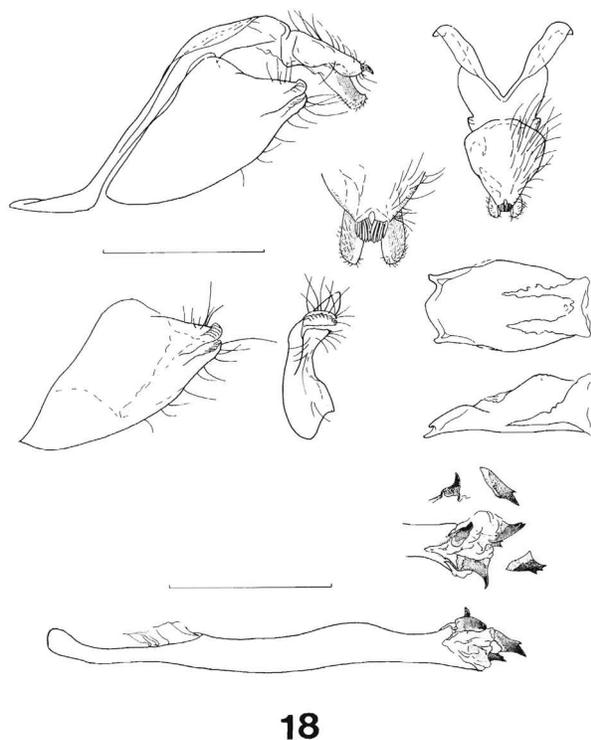
Description. Male. Head. Dorsally shaggy with golden hairs. Antennae anteriorly buff, posteriorly black; club about one-half length of shaft; nudum orange-brown; apiculus very short, apparently one abbreviated segment, its width greater than its length. Palpi, second segment shaggy with pale fulvous hairs, hairs black at anterolateral angles; third segment dorsally black-hirsute, ventrally fulvous, not exceeding hairs of second segment. **Body.** dorsally and ventrally black with golden hairs. Tegulae black with broad white edges. Legs with femora black, fringed with golden hairs, tibiae and tarsae white; hind tibia with single pair of spurs. **Wings.** Produced, narrow. Forewing length 8.5 mm ($n = 1$). Above stigma present but very obscure except under magnification, microandroconial mass gray, not nearly extending to origin of vein Cu1, brush patches and



17

FIG. 17. Male genitalia of *H. blancasi*, new species holotype. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted, (left lateral and distal dorsal aspects). Data as Fig. 1c. Scale = 1 mm.

post-stigmal patches of erect scales absent. Costa white. Broadly fuscous, with extremely pale, nearly hyaline, fulvous spots before end of discal cell, and subapical in spaces R4-R5 and R5-M1, in subterminal spots, (which are nearly continuous with postmedian macular band, not offset), in postmedian band from M1-M2 to Cu1-Cu2; spots of band in Cu2-2A extremely pale fulvous, not nearly hyaline; basad fuscous overscaled fulvous either side of fuscous streak dividing discal cell and costad of discal cell to end cell. Fringes fuscous. Below stigma pocket robust but short, upper element not nearly extending to origin of vein Cu1, diverging from discal cell cubitus vein much closer to vein Cu2 than to vein Cu1; lower elements tiny, uppermost broad (Fig. 2a). Spots as above but fuscous more extensively overscaled fulvous everywhere except in spaces Cu1-Cu2, Cu2-2A, and anal cell; entire costa and veins R4 to M1 distally white. Hindwings above wholly fuscous except for extremely pale fulvous, nearly hyaline, postmedian macular band from space Rs-M1 to M3-Cu1 (in M1-M3 elongate and ray-like from end discal cell) and pale fulvous in space Cu1-Cu2. Fringes fuscous basally, white vannally and terminally. Below, black spots basally in costal and discal cells and space Cu2-2A; postmedially in spaces Sc-Rs, Rs-M1, Cu1-Cu2, and end discal cell; border fuscous spots from distal end spaces Sc-Rs to Cu1-Cu2; space 2A-3A entirely fuscous overscaled fulvous and anal cell black; veins from Sc to Cu2 white;



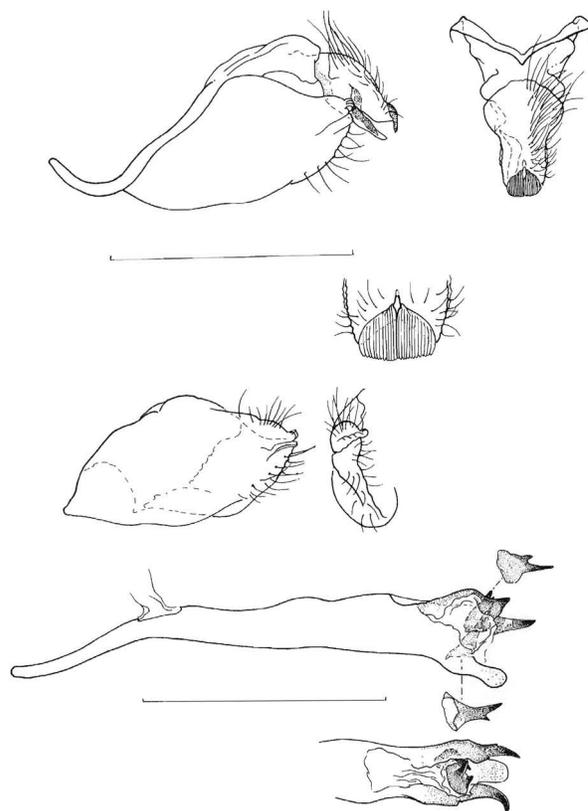
18

FIG. 18. Male genitalia of *H. tentativa*, new species holotype. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted, (left lateral and distal dorsal aspects). Data as Fig. 1d. Scale = 1 mm.

costa, distal half discal cell, and anterior half of distal two-thirds space Cu2-2A white; posterior half of distal two-thirds space Cu2-2A very pale fulvous, as are the distal portions of pale spots of spaces Rs-M1 to Cu1-Cu2,- that in M1-M3 a streak centrally for distal two thirds, a buff spot discally in space Sc-Rs. Fringes both wings sullied white, white vannally. **Genitalia.** Eighth tergite (Fig. 4g) with lateral margin not distinctly emarginate before caudal margin; terminal bristle-sockets slightly enlarged before caudal margin. Valva (Fig. 19) in lateral view broad, with basal, dorsal, and ventral margins more or less convex, caudal beak not prominent; length basal margin much less than one and one-half depth of valva. Penis proximally reflexed slightly ventrad, its length greatly exceeding length genitalic capsule and more than twice that of valva, elongate ventrocaudally as a terminally rounded, spatulate "floor"; titillators nearly symmetric, huge, laterally compressed thorns, each terminally with slender hooks laterad, sclerotically strapped to penis; cornuti asymmetric, minutely bidentate. Juxta severely damaged, not definable. Uncus in dorsal view, anterior half rounded, posterior half parallel-sided, where scarcely minutely serrate to pectines; pectines large, each half medially longer than broad, anteriorly tapered to cleft, posteriorly truncate, the tines numerous, inconspicuous, in lateral view pectines dorsally arched. Gnathos in lateral view mostly membranous, narrowly sclerotized dorsad, not divergent nor exceeding pectines caudad, but uncus caudad and pectines slightly arched dorsad from gnathos.

Female. Unknown.

Type. Holotype ♂ PERÚ, Dept. Junín, vic. Abra Anticona, 4843 m, X-19-83, A. M. Shapiro (genitalic dissection # ♂ 5005-JH), in CAS.

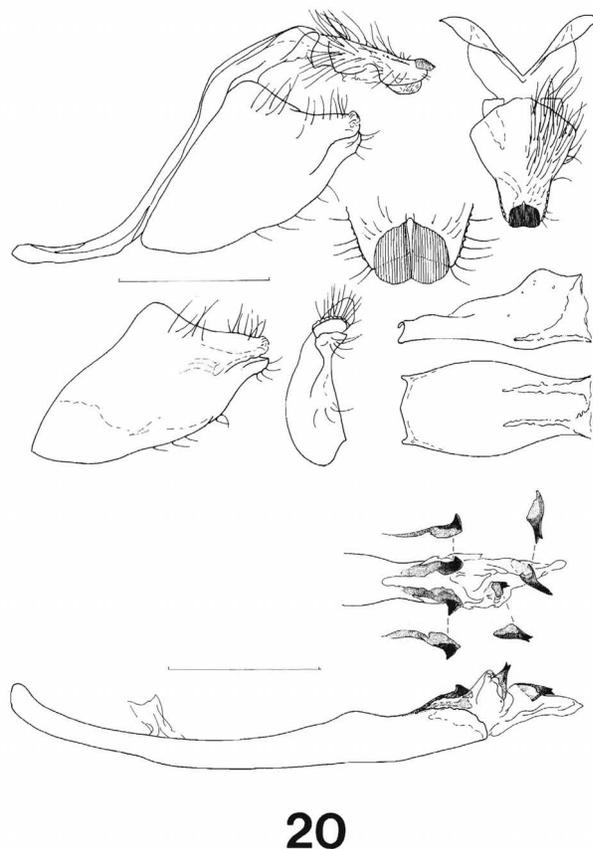


19

FIG. 19. Male genitalia of *H. shapiro*, new species holotype. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), penis with vesica everted, (left lateral and distal dorsal aspects). Data as Fig. 2a. Scale = 1 mm.

Etymology. I am delighted to name this remarkable little species for Arthur M. Shapiro, the collector of the only known specimen. Art has provided enormous and continuous support throughout these studies with years of discussion and careful collecting in South America.

Diagnosis and discussion. This small species dorsally appears to be more black and white rather than black and fulvous, and it does not seem to have a stigma until it is examined under magnification. The single pair of spurs on the metathoracic tibiae is a unique characteristic of this species within the *boulleti* group of *Hylephila*. This specimen was figured by Shapiro (1985) in his paper summarizing behavioral and ecological observations of the high altitude pierines he studied. In that paper, he discussed the morphospecializations of the genus *Phulia* Herrich-Schäffer and suggested that the convergence of the high altitude hesperiid fauna to the "dashed *Phulia* pattern" of high Andean pierines was owing to adapta-



20

FIG. 20. Male genitalia of *H. galera*? Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted, (left lateral and distal dorsal aspects). Data as Fig. 2c. Scale = 1 mm.

tion for crypsis. The type was collected in October flying with *H. peruana*.

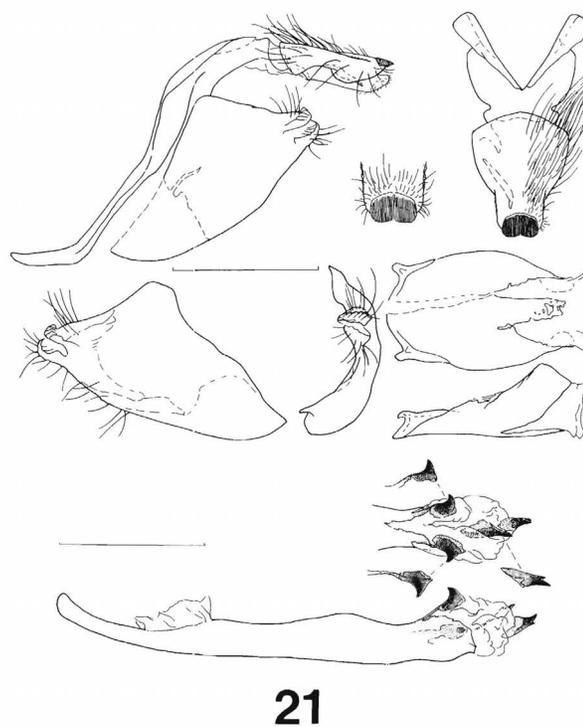
Hylephila galera Evans

(Figs. 2b, 2c, 2d, 5a, 5b, 20, 21, 43, 44, 45, 58)

Hylephila galera Evans, 1955. Cat. Amer. Hesp. part IV, p. 314, pl. 75. Bridges, 1983, Lepid.:Hesp. Notes on species group names, part 1:47.

In the description below, brackets, indicate remarks not taken from the type but from specimens #6121 and/or #6307.

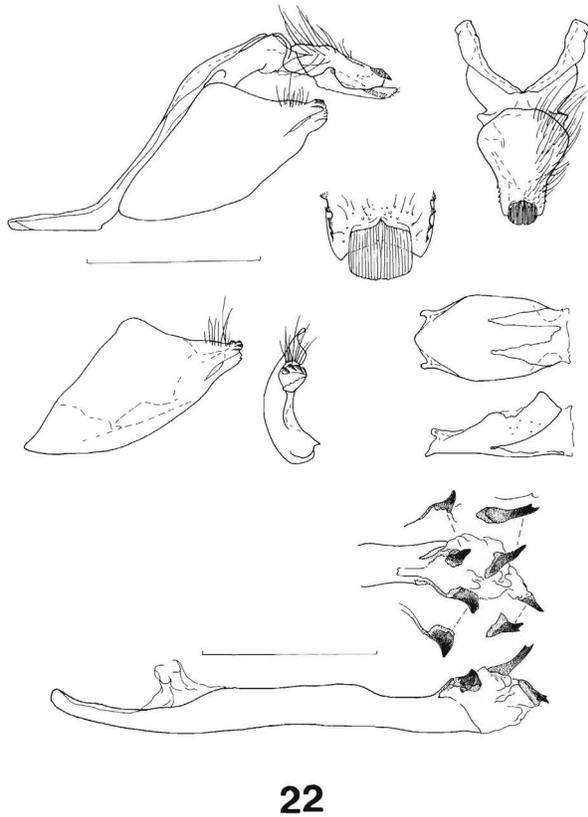
Description. Male. Head. Dorsally black with orange hairs; antennae with club about one-half length of shaft, anteriorly buff merging dorsally to fulvous and ventrally to white, posteriorly black with scattered fulvous to white scales, nudum orange-brown, apiculus with ultimate segment slightly longer than wide; palpi missing [#6121: palpi with third segment evident but scarcely exceeding long, hair-like vestiture of second segment]. **Body.** [#6121: dorsally black with long golden hairs, ventrally black with long, shaggy, fulvous hairs. Legs black, overscaled buff, with long fringes of orange hairs, hind tibiae with two pairs of spurs]. **Wings.** Broad, rounded. Forewing length 13 mm [range 13–14 mm] (n = 3) Above, stigma



21

FIG. 21. Male genitalia of *H. galera*? Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted, (left lateral and distal dorsal aspects). Data as Fig. 2d. Scale = 1 mm.

conspicuous but narrow, apical and lower brush patches evident, as is the rather narrow post-stigmal patch [#6121: microandroconial mass dark brown]. Fulvous extensive, conspicuously penetrating wide fuscous border along veins to termen, inner edge subterminal fulvous spots offset from inner edge postmedian macular band; fringes basally fuscous, terminally orange. Below, stigma pocket narrow, upper element extends proximad from just beyond origin of vein Cu1, diverges from discal cell cubitus vein much closer to origin of vein Cu1 than to Cu2, and does not nearly reach vein Cu2; lower elements well separated from veins Cu2, 2A, and from each other (Fig. 2b). [#6121: upper element stigma pocket extends just beyond origin vein Cu1 and diverges from discal cell cubitus vein about equidistant from origins veins Cu1 and Cu2, without quite reaching vein Cu2; lower elements small, well separated (Fig. 2c); #6307: upper element nearly reaching vein Cu2, lower elements large, not widely separated (Fig. 2d)]. Fulvous extensive, costa and veins not whitened [#6121, 6307: veins R4 to M1 and costa whitened, at least under magnification], but veins R5 and M1 much paler distad. Hindwings above fulvous as on forewings penetrating border to termen. Below rich fulvous very extensive, entering lower half of discal cell nearly or quite to base, none of the veins whitened [#6121, 6307: veins of discal cell and from Rs to Cu2 white under magnification]. Fringes both wings basally sullied orange [#6121: or fuscous], terminally orange [#6121: or white]. **Genitalia.** Badly damaged; uncus eaten, penis, vinculum partly eaten, saccus missing, valvae damaged, titillators and cornuti intact but not everted. [#6121 6307: eighth tergite lateral margin broadly concave and abruptly emarginate before caudal margin (Figs. 5a, b). Valvae (Figs. 20, 21) in lateral view somewhat broad, ventral and basal



22

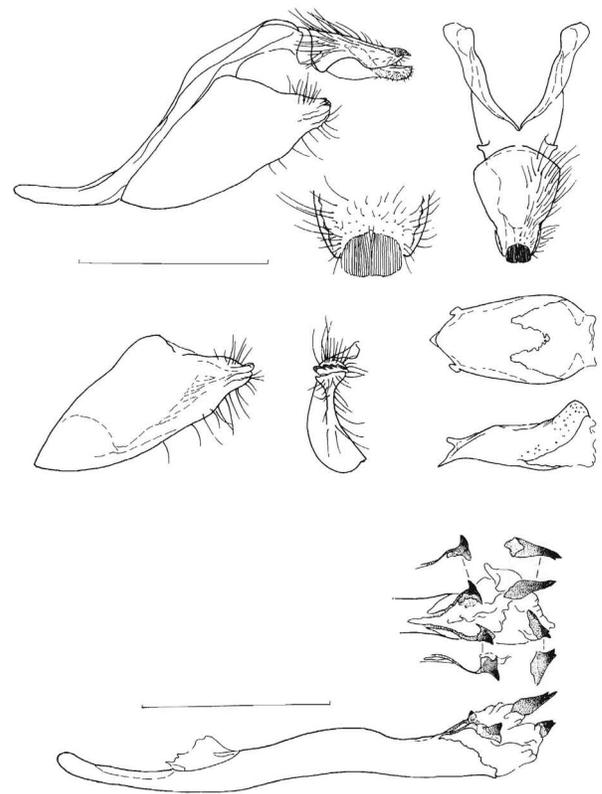
FIG. 22. Male genitalia of *H. bouletti*. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted (left lateral and distal dorsal aspects). Data as Fig. 5c. Scale = 1 mm.

margins gently convex, dorsal margin and ventral margins caudally concave to caudal beak; length basal margin about one and one-half times depth of valva. Penis proximally curved dorsad, its length subequal to length of genitalic capsule and almost twice length of valva; titillators short, thorn-like, sclerotically strapped to penis; cornuti nearly symmetric, very narrowly bidentate. Juxta with ventrocaudal clefts long, nearly one-half length of juxta. Uncus in dorsal view roughly triangular, not distinctly rounded cephalad, laterally abruptly angled posteriorly one-half distance to very gradually tapered, laterally serrate, posterior half to caudal pectines, the caudal cleft not or scarcely exceeding pectines cephalad; pectines large, each half slightly longer than broad, anteriorly rounded, posteriorly emarginate, the tines numerous, inconspicuous. Gnathos in lateral view scarcely sclerotized, not exceeding pectines caudad, and not divergent ventrally from uncus].

Female. Unknown.

Type. Holotype ♂ PERÚ, Dept. Junín, Galera Pass, 4800 m, II-?-00 (Simons), "snowy season," in BMNH.

Discussion. The two additional specimens I have seen I believe represent this species, but they differ somewhat from the type, most particularly in the elements of the stigma pockets. Neither has the upper element as reduced as does the type, and # ♂ 6307 has the lower elements very much larger and proximate



23

FIG. 23. Male genitalia of *H. bouletti*. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted (left lateral and distal dorsal aspects). Data as Fig. 5d. Scale = 1 mm.

(Fig. 2d). These specimens will be placed in the following collections: #6121, from Tarma, Junín, Perú, 3000 m, in LACM, and #6307, from Yauli, Corpacancha, Junín, Perú, 4300 m, in MUSM. This species flies in January and February.

Hylephila bouletti (Mabille)

(Figs. 3a, 3b, 5c, 5d, 7, 10, 22, 23, 28, 29, 46, 47, 48, 49, 50, 51, 59)

Chaerephon bouletti Mabille, 1906. Bull. Soc. Entomol. France, no. 6:67-68.

Hylephila bouletti, Ureta, 1956. Bol. Mus. Nat. Hist. Nat. 26: 176, pl. 2, fig. 5b-5d; MacNeill & Herrera, 1999, J. Lepid. Soc. 52:291.

Hylephila bouletti (sic) *bouletti*, Ureta, 1963. Bol. Mus. Nac. Hist. Nat. 28:78,79.

Hylephila bouletti bouletti, Evans, 1955. Cat. Amer. Hesp. part IV, p. 314, pl. 755; Hayward, 1973. Opera Lilloana 23:93; Lewis, 1973, Butterflies of the World, p. 246, pl. 83, fig. 17; Bridges, 1983,

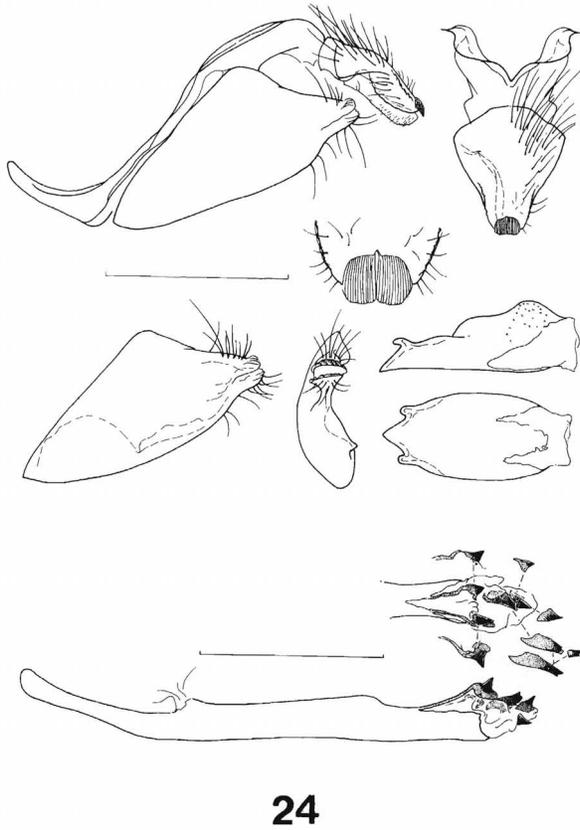


FIG. 24. Male genitalia of *H. rossi*, new species holotype. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted (left lateral and distal dorsal aspects). Data as Fig. 3c. Scale = 1 mm.

Lepid.: Hesp. Notes on species group names, part 1:18; Shapiro, 1993, *J. Res. Lepid.* 30:163, 164; Peña & Ugarte, 1997, *Las mariposas de Chile, the butterflies of Chile*, p. 128, figs.

Description. Male. Head. Dorsally very pale fulvous, with long, black hair-like scales rising from paired, postmedial black scale patches which are separated by smaller, triangular, medial patch on the vertex; pale, fulvous hair-like scales elsewhere except for mixed black and fulvous eyelash scales. Antennae anteriorly pale buffy to white, posteriorly black; club about one-half length of shaft; nudum pale orange to orange brown on apiculus; apiculus about three short segments, its basal width about equal to its length. Palpi third segment black, ventrally mostly pale fulvous to buff, clearly to scarcely emergent from shaggy vestiture of second segment, where anterolateral angles have scattered black hairs. **Body** dorsally black with scattered, long, pale golden vestiture of hair-like scales concentrated medially, pectus and venter white to pale fulvous. Legs mostly white, fringed fulvous, hind tibiae with two pairs of spurs, the upper occasionally somewhat reduced. **Wings.** Somewhat pointed apically, not stubby. Forewing average length 10.7 mm [range 9–13 mm] ($n = 40$). Above, stigma slender, conspicuous, microandroconial mass inconspicuous without magnification, gray or tan to (rarely) yellow, apical and lower brush patches present, poststigmatal patch conspicuous but not broad. Fulvous pale tawny, very variable in extent (cf. Figs. 46

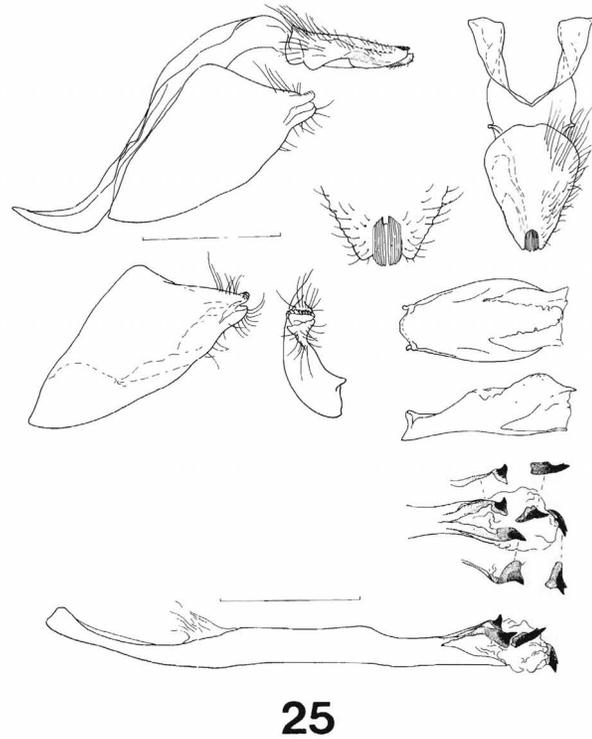
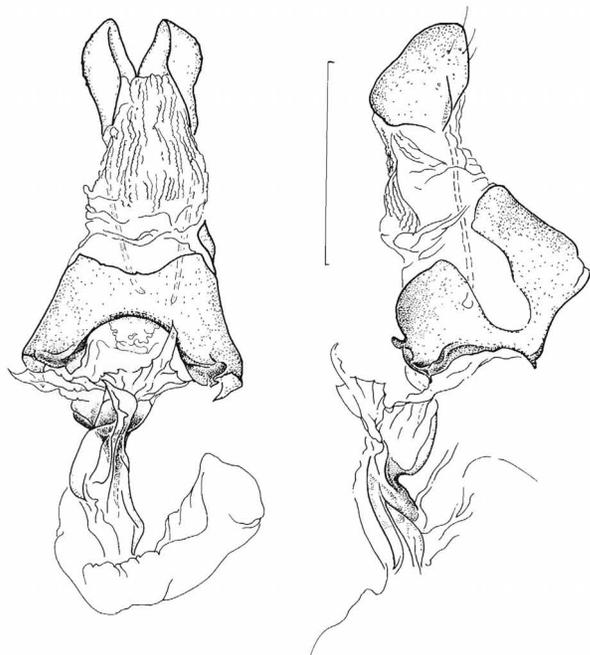


FIG. 25. Male genitalia of *H. peruana*. Uncus (lateral and dorsal aspects, dorsal of pectines enlarged), valvae (left outer and caudal aspects, right inner aspect), juxta (left lateral and ventral aspects), penis with vesica everted, (left lateral and distal dorsal aspects). Data as Fig. 3d. Scale = 1 mm.

and 48); fuscous border if broad and clearly cut by fulvous veins, the fulvous not reaching termen along veins. Below, stigma pockets slender (Figs. 3a, b), diverging from discal cell cubitus vein about equidistant from origins of veins Cu1 and Cu2 or usually slightly nearer to that of vein Cu1 (but see Fig. 3b). Fulvous more extensive, costa and most veins whitened distally to termen. Fringes pale, basal third fuscous, middle third light fulvous, terminal third white. Hindwings above as forewings, variable, border broad or narrow, usually not cut to termen by fulvous along veins. Postmedian macular band conspicuous, usually extending ray-like into at least lower part of discal cell from space M1–M3 and from vein 2A to Rs. Vein 2A fulvous from base to termen defining vannal fuscous area. Below pale fulvous to almost white. Costa and all veins whitened, often including vein 3A, vannal area fuscous. **Genitalia.** Eighth tergite (Figs. 5c, d) with lateral margin broadly concave or sinuate cephalad, not distinctly emarginate just before caudal margin; terminal bristle-sockets rounded in cross section and enlarged before caudal margin (Fig. 7). Valva (Figs. 22, 23) in lateral view broad, ventral margin convex, basal margin straight, dorsal margin slightly concave to caudal beak where knobs dorsad of caudal horizontal cleft few; length basal margin about equal to one and one-half depth of valva. Penis proximally slightly curved dorsad, its length slightly greater than length of genital capsule and less than twice length of valva; titillators large, asymmetric, the left very broadly and the right more narrowly thorn-like, both sclerotically strapped to penis; cornuti asymmetric, one long, narrow, and basally very elongate, the other short, thorn-like, both minutely bidentate. Juxta broad, not elongate, with ventrocaudal clefts long, about one-half length of juxta, separated median floor nearly or quite reaching caudal margin of juxta. Uncus in dorsal view



26

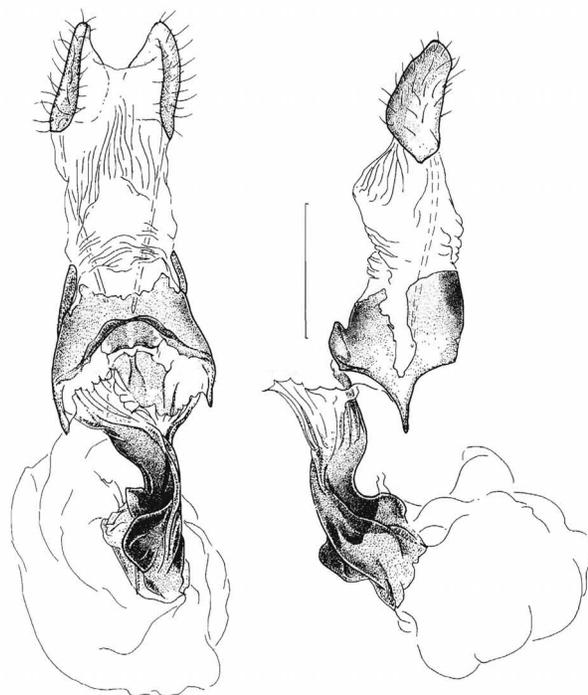
FIG. 26. Female genitalia of *H. herrerae*, new species, paratype (ventral and right lateral aspects). CHILE, Parinacota, "Arica," Cotacotani, 4500 m, II-28-48, (genitalic dissection # ♀6118-CDM) in CAS. Scale = 1 mm.

with lateral margins broadly angulate at anterior one-fourth, then emarginate to nearly parallel-sided caudal one-third, where minutely serrate to caudal tip which exceeds width of pectines, caudal cleft scarcely exceeding pectines cephalad; pectines not minute, length each half usually about twice its breadth, anteriorly and posteriorly nearly or quite truncate; the tines many, inconspicuous. Gnathos in lateral view scarcely sclerotized, slightly exceeding pectines caudad, and not very divergent ventrally from uncus.

Female. Head. As male, antennal shaft about twice length of club. **Wings.** Tawny to very pale fulvous (Figs. 47, 49). Forewing, average length 11.9 mm [range 10–15 mm] ($n = 35$). Dorsal surface as male; ventral surface pale fulvous much expanded, fuscous border greatly reduced, or faded to nearly obsolete. **Genitalia.** Eighth sternite in ventral view sclerotized and broadly crescentic, its greatest width caudolaterally, its length about one-fourth to one-third its width. Apophysis anterioris in lateral view (Figs. 28, 29) somewhat to scarcely produced cephalad of junction with lamella postvaginalis. Lamella postvaginalis in ventral view narrowly united, each half produced ventro-cephalad forming a slight anterior bulge, not nipple-like, medially not produced ventrally. Antrum dorsally sclerotized and with a longitudinal fold, ventrally caudal and lateral one-half membranous. Ductus bursae well sclerotized, in right lateral view ductal constriction not very abrupt, the sinus U-shaped; left lateral pocket slightly to prominently produced.

Type. Mabille's type, a female, is presumably in the Muséum National Histoire Naturelle, in Paris, France. It was collected in Perú.

Diagnosis and discussion. The material from Argentina I have seen (8 specimens) is all from the pre-



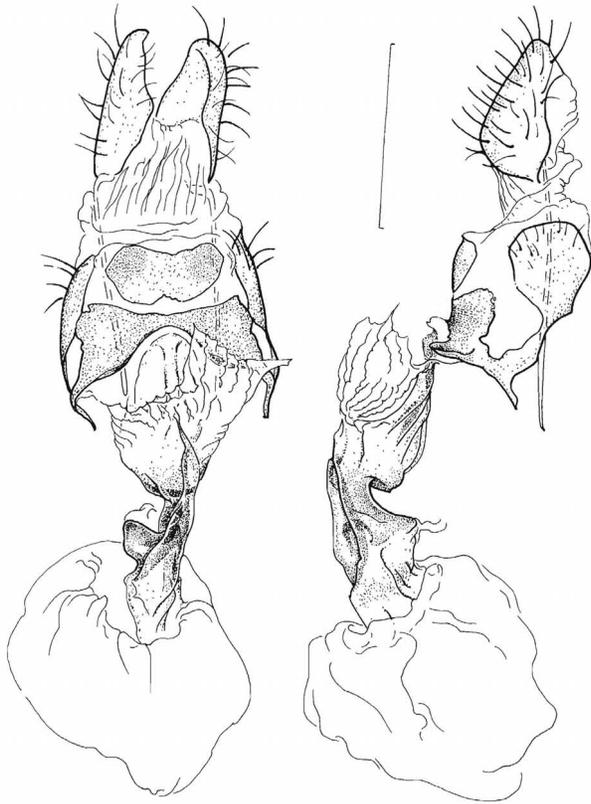
27

FIG. 27. Female genitalia of *H. tentativa*, new species, paratype (ventral and right lateral aspects). PERÚ, Ayacucho, Rio Apacheta 4200 m, 13°21'S, 74°39'W, I-24-99, G. Lamas, (genitalia dissection # ♀6309-CDM), in MUSM. Scale = 1 mm.

Andean Nevadas del Aconquija, just west of San Miguel de Tucumán in provincias Catamarca and Tucumán. The males (4 specimens) are somewhat variable in their genitalia (see Fig. 23, # ♂ 6213, from Catamarca) and may not represent a single species, but I am content to consider them all minor variations of *H. bouletti* until such time as more and better material can be studied.

Males of *H. bouletti* have a stigma with a microandroconial mass that is usually neither conspicuous nor yellow, they have two pairs of metathoracic tibial spurs, and usually lack wing borders above that are deeply and broadly cut by fulvous along the veins. This species is very pale fulvous above, not orange fulvous; and it seems to fly alone, not within the ranges of most other species of the *bouletti* group, save for *H. herrerae*. Its range does evidently overlap those of the next species and of *H. peruana* slightly in a narrow region of Puno, Perú, northwest of Lago Titicaca near the border of Departamento Cuzco (Fig. 59). *Hylephila bouletti* seems to be on the wing through most of the year except for June through August.

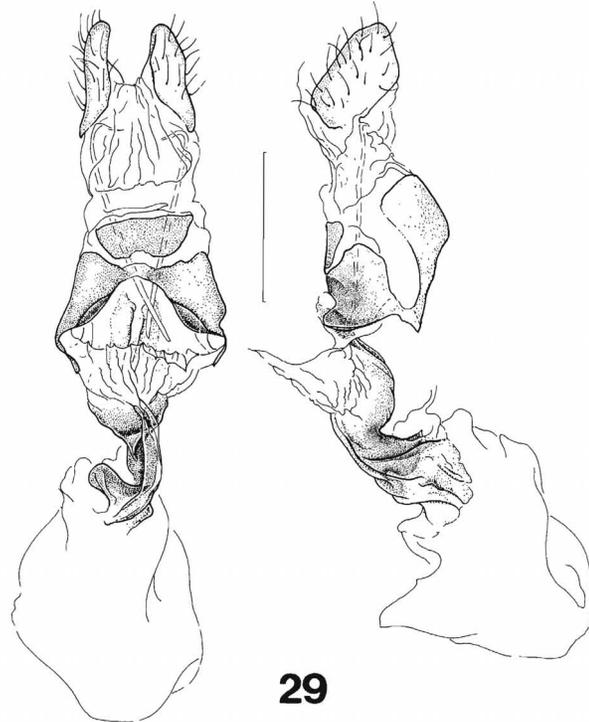
This species is the most commonly collected mem-



28

FIG. 28. Female genitalia of *H. bouletti* (ventral and right lateral aspects). CHILE, El Loa, Geiser el Tatio, 4360 m, I-29-65, J. Herrera, (genitalic dissection # ♀6218-CDM), in CAS. Scale = 1 mm.

ber of the *bouletti* group. Indeed, I have seen a total of 55 males and 40 females (27 males, 23 females dissected) representing 32 localities in Perú, Chile, Bolivia, and Argentina; but the samples almost always consisted of one to three specimens, except for one locality in Chile and another in Argentina; where the sample was six specimens. It wasn't until the mid-1990's when Arthur M. Shapiro made five collections, under a CONAF collection permit issued 18 November 1994 in Arica, Chile, by Juan Silva, Director, CONAF, 1st region, that samples of up to 25 were taken. Shapiro 1995, in litt. stated that at one locality the *H. bouletti* "were as common as I have ever seen any skipper anywhere; I could have taken hundreds, if not thousands." The skippers were (in his words) "incredibly abundant on monocultures of the apparent host (oviposition substrate), *Deyeuxia breviaristata* Wedd., a small wiry grass that grows just (above) the margins of boggy and saline environments." The fa-



29

FIG. 29. Female genitalia of *H. bouletti* (ventral and right lateral aspects). ARGENTINA, Tucumán, Huaca Huasi, Lago Nostra, 4250 m, XII-26-78, Halloy, (genitalic dissection # ♀6214-CDM), in IML. Scale = 1 mm.

vored nectar source was a small composite, *Werneria*, that grows flat on the ground in boggy turf, (fide Shapiro). He observed oviposition on *Deyeuxia*, often on plants that seemed dry and desiccated, presumably owing to the rains having just started.

Twenty-three ova were recovered by dissection prior to KOH treatment (see MacNeill & Herrera 1999:279) from three females (# ♀ 6218, # ♀ 6264, and # ♀ 6265), and these averaged 0.8 mm in diameter and 0.58 mm in height. The diameter ranged from 0.75 to 0.83 mm, and the height ranged from 0.55 to 0.65 mm. The three females separately had different averages: # ♀ 6218 measured the largest with 9 ova averaging 0.82×0.60 mm, and # ♀ 6265 measured the smallest with 8 ova averaging 0.78×0.57 mm. The most common (not average) measurement of the 23 ova was 0.8×0.6 mm, a fairly high-domed egg, by and large. The reticulation was very weakly evident at 100× magnification.

Hylephila rossi MacNeill, new species

(Figs. 3c, 24, 30, 52, 53, 58)

Description. Male. Head. Vestiture buff tinted fulvous mixed with black hairs, eyelash black. Palpi with mostly black third segment emergent from buff hairs of second segment. Antennal club

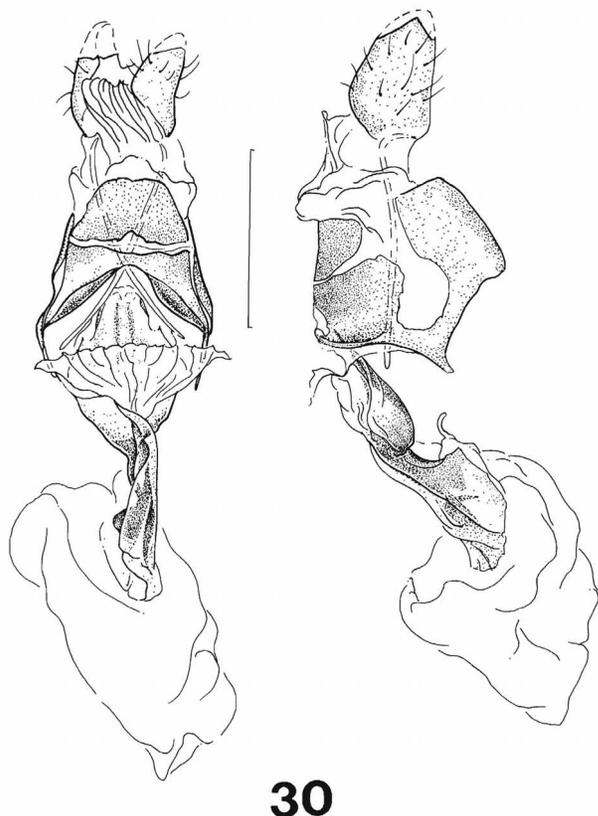


FIG. 30. Female genitalia of *H. rossi*, new species, paratype (ventral and right lateral aspects). PERÚ, Cuzco-Puno, La Raya, 4318 m, IV-19-71, J. Herrera, (genitalic dissection # ♀3829-JH), in CAS. Scale = 1 mm.

anteriorly buff merging to fulvous and black above, to white below, posteriorly black; nudum orange-brown, apiculus width equal to length; shaft more than twice club length. **Body.** Hind legs missing. **Wings.** Narrow, pointed. Forewing length 12.5 mm ($n = 1$). Stigma rather narrow; microandroconial mass brownish gray; apical, middle, and lower brush patches present; post-stigmal patch fairly broad. Orange-fulvous of apical, and subterminal spots, also of narrow postmedian macular band (offset from the subterminal spots), and of lower one-half of discal cell (expanded end cell), somewhat restricted by fuscous of costal area, of upper half of discal cell, of space Cu2-2A basad of stigma, and of broad, slightly indented border. Fringes above fuscous. Below, upper element of stigma pocket diverging from cubitus vein of discal cell about equidistant between origins of veins Cu1 and Cu2, extending nearly or quite basad to vein Cu2, lower elements large (Fig. 3c), veins not whitened. Hindwing above with orange-fulvous very restricted to posterior arm of postmedian macular band from M1-M3 to Cu1-Cu2, and vein 2A also fulvous. Below fulvous expanded to base in space Cu2-2A and in anterior arm of postmedian macular band across space Rs-M1. Veins buff, slightly paler than fulvous ground color, but not whitened. Fringes sullied orange, vannally orange. **Genitalia.** Eighth tergite lateral margin broadly concave, not emarginate just before caudal margin; terminal bristle-sockets slightly enlarged before caudal margin. Valva (Fig. 24) in lateral view somewhat narrow, ventral margin convex, caudally emarginate to beak, basal margin straight, dorsal margin slightly concave to caudal beak where knobs dorsad of horizontal cleft several; length basal margin about equal to one and one-half depth of valva. Penis proximally slightly curved

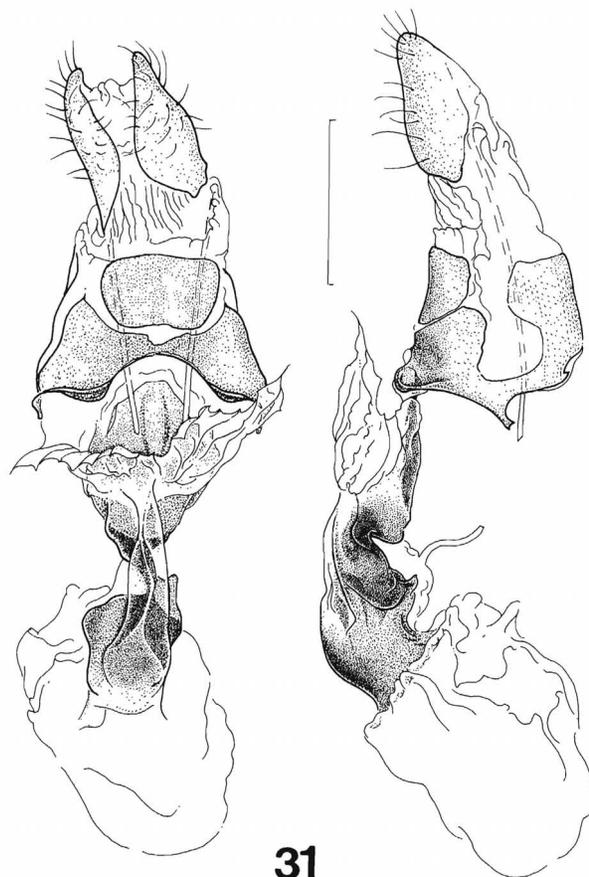
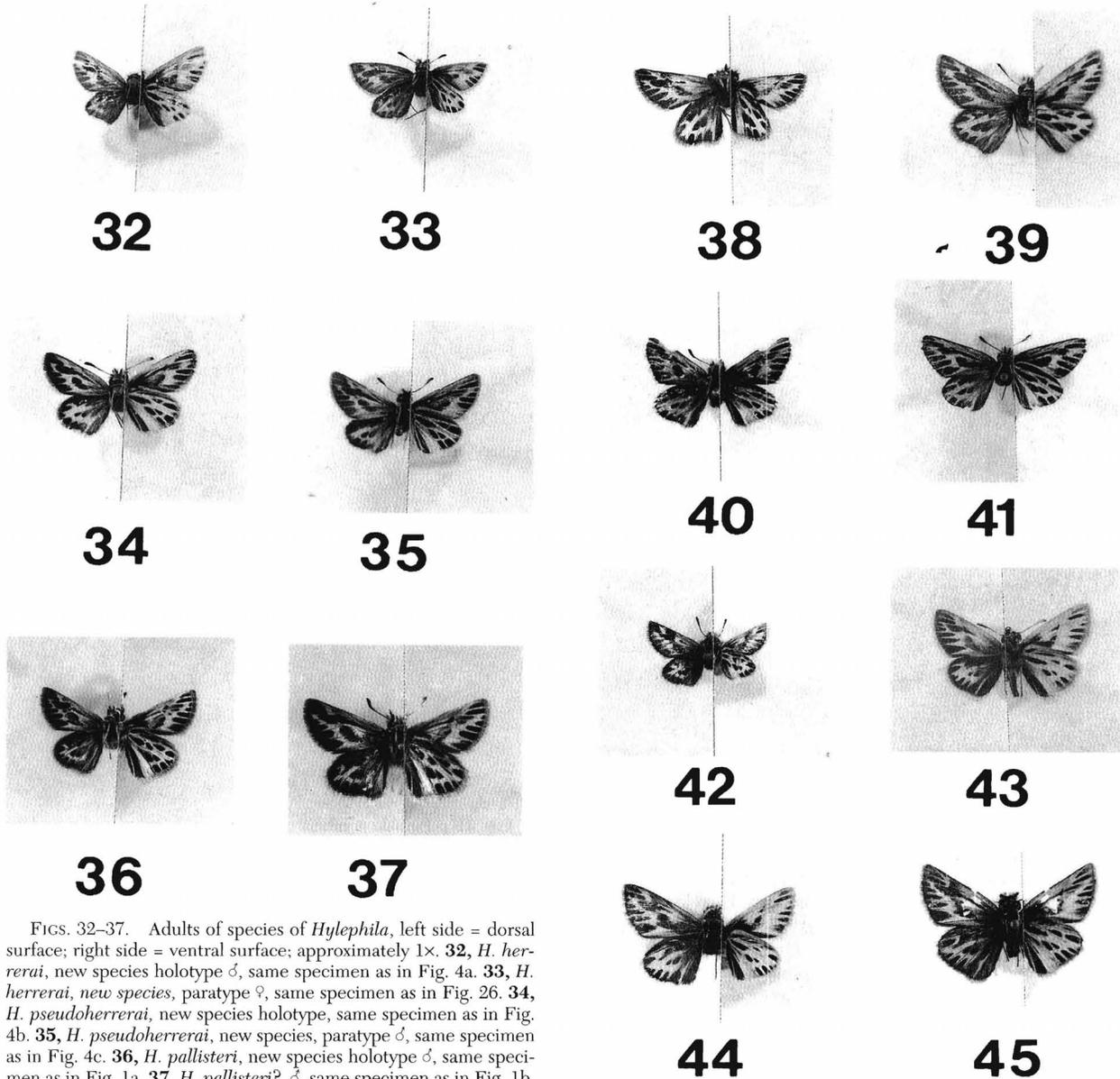


FIG. 31. Female genitalia of *H. peruana* (ventral and right lateral aspects). PERÚ, Junín, Pachachaca, 4201 m, IV-9-71, J. Herrera (genitalic dissection # ♀3872-JH), in CAS. Scale = 1 mm.

dorsad, its length exceeding length of genitalic capsule but not twice length of valva; titillators small, nearly symmetric, broadly thorn-like, sclerotically strapped to penis; cornuti three, asymmetric, one slender, elongate, minutely bidentate, the others small, thorn-like, unidentate. Juxta narrow, elongate, with ventrocaudal clefts not quite one-half length of juxta, separated median floor not reaching caudal margin of juxta. Uncus in dorsal view more or less triangular, posteriorly tapered (where minutely serrate) to caudal tip which scarcely exceeds width of pectines, caudal cleft scarcely exceeding pectines cephalad; pectines small, length each half less than twice its breadth, anteriorly and posteriorly nearly truncate; in lateral view uncus dorsally arched, pectines conspicuously so. Gnathos in lateral view scarcely sclerotized, not divergent ventrally from uncus, and not exceeding pectines caudad.

Female. Head. As male but buff areas paler. **Body.** Hind tibia with upper pair of spurs much reduced, lower pair long. **Wings.** Forewing length 12.5 mm ($n = 1$). Above, markings rich fulvous, restricted slightly more than in male, but subterminal spots inclined and scarcely offset from postmedian macular band. Hindwing with fulvous along veins penetrating fuscous border nearly to termen. Below, fulvous expanded; veins Rs to Cu2 somewhat whitened. Fringes both wings above and below sullied white. **Genitalia.** Eighth sternite in ventral view broad, its greatest transverse width cephalad about twice its length. Apophysis anterioris in lateral view (Fig. 30) produced somewhat cephalad of junction with lamella postvaginalis.



FIGS. 32-37. Adults of species of *Hylephila*, left side = dorsal surface; right side = ventral surface; approximately 1x. **32**, *H. herrerae*, new species holotype ♂, same specimen as in Fig. 4a. **33**, *H. herrerae*, new species, paratype ♀, same specimen as in Fig. 26. **34**, *H. pseudoherrerae*, new species holotype, same specimen as in Fig. 4b. **35**, *H. pseudoherrerae*, new species, paratype ♂, same specimen as in Fig. 4c. **36**, *H. pallisteri*, new species holotype ♂, same specimen as in Fig. 1a. **37**, *H. pallisteri*?, ♂, same specimen as in Fig. 1b.

Lamella postvaginalis in ventral view very narrowly united forming a distinct V at the junction, from which, in lateral view, each half produced but scarcely bulging cephalad. Antrum dorsally sclerotized and with longitudinal fold, caudal half membranous ventrally and laterally. Ductus bursae sclerotized, left lateral pocket evident in lateral view but not prominent.

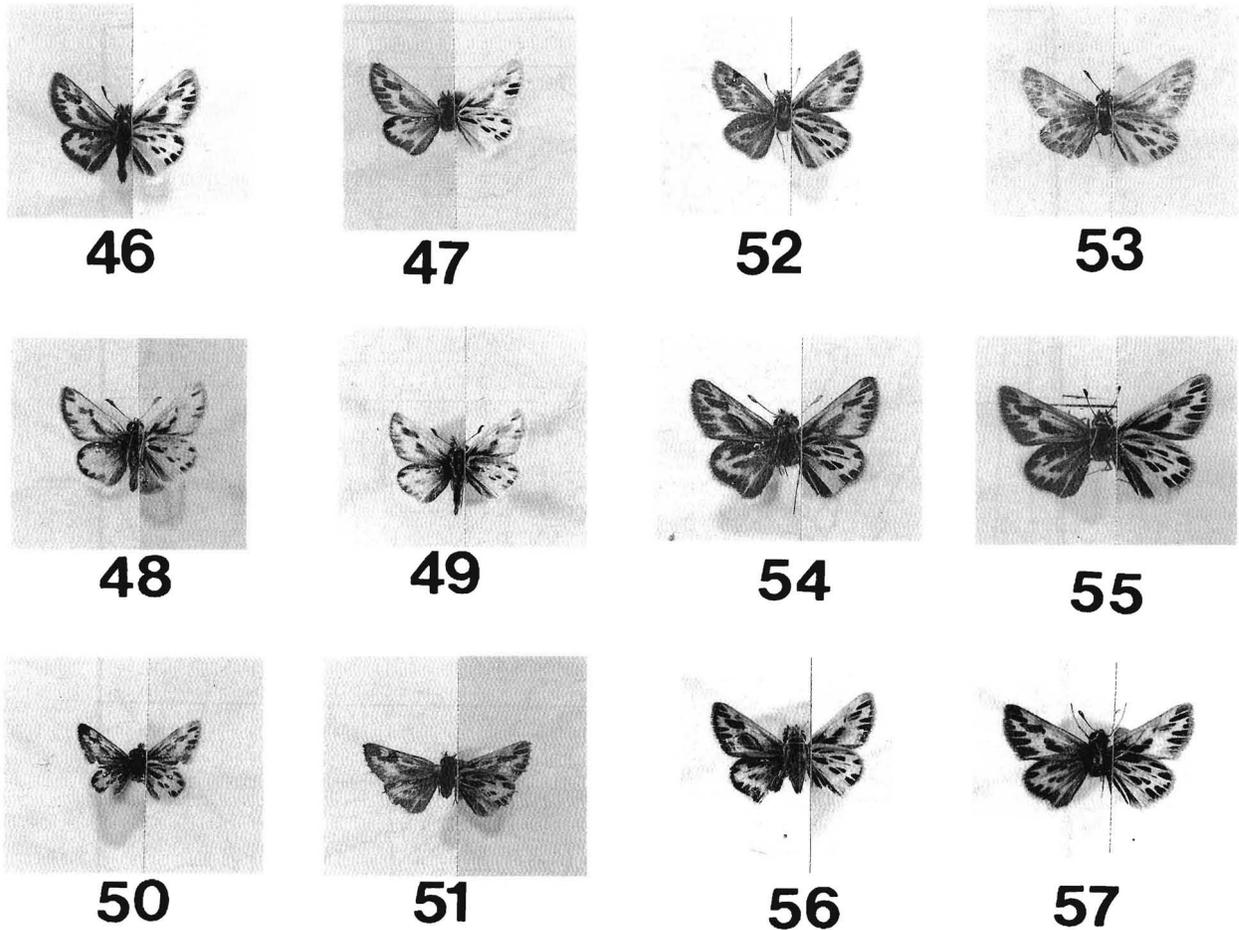
Types. Holotype ♂ PERÚ, (Puno), 10 mi N. of Ayaviri, III-1-51, E. S. Ross & A. E. Michelbacher (genitalic dissection # ♂ 3821-JH), in CAS. Paratype. 1 ♀ PERÚ, Cuzco-Puno, La Raya, 4318 m, IV-19-71, J. Herrera (genitalic dissection # ♀ 3829-JH), in CAS.

Etymology. This species is named for Edward S. Ross, curator emeritus of the California Academy of Sciences, one of the collectors of the single male known.

Diagnosis and discussion. *Hylephila rossi* is closely related to *H. bouletti*, and the two known specimens are from the only region of overlap known be-

FIGS. 38-45. Adults of species of *Hylephila*, left side = dorsal surfaces; right side = ventral surfaces. Approximately 1x. **38**, *H. blancasi*, new species holotype ♂, same specimen as in Fig. 1c. **39**, *H. blancasi*, new species, paratype ♂, PERÚ, Huanuco, illegible locality, Holland collection, (genitalic dissection # ♂ 6280-CDM), in CMNH. **40**, *H. tentativa*, new species holotype ♂, same specimen as in Fig. 1d. **41**, *H. tentativa*, new species, paratype ♀, same specimen as in Fig. 27. **42**, *H. shapiro*, new species holotype ♂, same specimen as in Fig. 2a. **43**, *H. galera*, holotype ♂, same specimen as in Fig. 2b. **44**, *H. galera*? ♂, same specimen as in Fig. 2c. **45**, *H. galera*? ♂, same specimen as in Fig. 2d.

tween *H. bouletti* and *H. peruana* (Figs. 58, 59). This species is much darker with much less fulvous above in both sexes than *H. bouletti*, and the fulvous is much more orange than the pale fulvous of the latter. Both



FIGS. 46–51. Adults of species of *Hylephila*, left side = dorsal surfaces; right side = ventral surfaces. Approximately 1×: **46**, *H. bouletti*, ♂, same specimen as in Fig. 3a, **47**, *H. bouletti*, ♀, same specimen as in Fig. 28. **48**, *H. bouletti*, ♂, CHILE, Parinacota, Reserv. Nac. Salar de Surire, no. shore, 4250 m, XI-22-94, A. M. Shapiro, in CAS. **49**, *H. bouletti*, ♀, same data as specimen in Fig. 48. **50**, *H. bouletti*, ♂, same specimen as in Fig. 5d. **51**, *H. bouletti*, ♀, ARGENTINA, Tucumán, Las Animas Portezuelo, 4540 m, I-26-79, Dominquez, in AMNH.

FIGS. 52–57. Adults of species of *Hylephila*, left side = dorsal surfaces; right side = ventral surfaces. Approximately 1×: **52**, *H. rossi*, new species holotype ♂, same specimen as in Fig. 3c. **53**, *H. rossi*, new species, paratype ♀, same specimen as in Fig. 30. **54**, *H. peruana*, ♂ same specimen as in Fig. 3d. **55**, *H. peruana* ♀, same specimen as in Fig. 31. **56**, *H. peruana* ♂, PERÚ, Cuzco, Cuzco-Ollantaitambo Rd., VII-7-84, 3000 m, S. Courtney & P. Stern, in CAS. **57**, *H. peruana* ♀ PERÚ, Junín, vic. Abra Anticona, 4843 ± 100 m, X-19-83 A. M. Shapiro (genitalic dissection # ♀ 6143-CDM), in CAS.

the male and female genitalia of each are also slightly different (cf. Figs. 22, 24 and Figs. 28, 30). It flies during March and April.

Hylephila peruana Draudt

(Figs. 3d, 5e, 8, 11, 25, 31, 54, 55, 56, 57, 59)

Hylephila lima (sic) Dyar (nec Plötz), 1913. Proc. U.S. Nat Mus. 45:639.

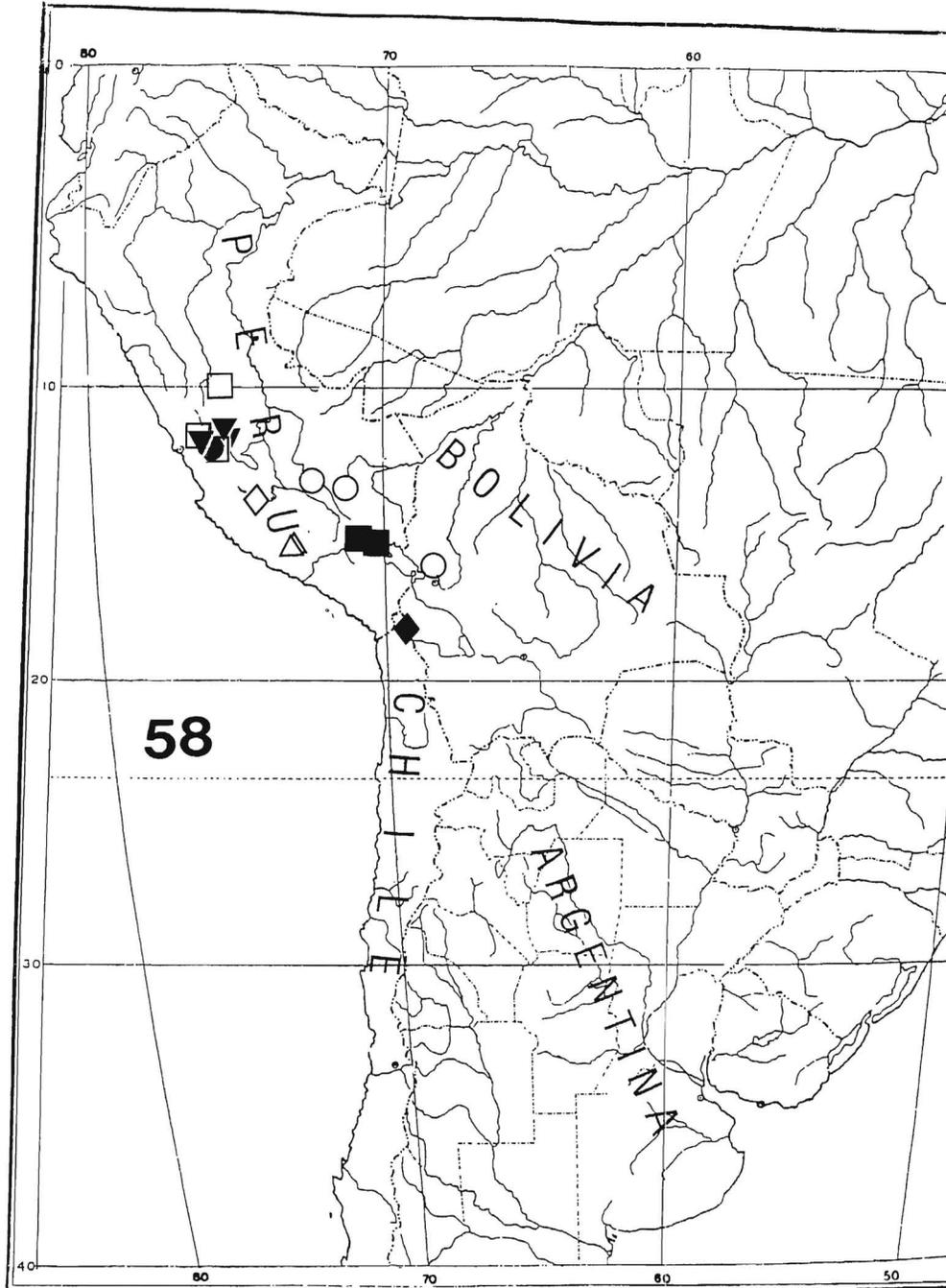
Hylephila peruana Draudt, 1923 [in Seitz] Gross Schmet. Erde 5:929, pl. 180 f.; MacNeill & Herrera, 1999. J. Lepid. Soc. 52:279–280, 291.

Hylephila bouletti peruana, Evans, 1955. Cat. Amer. Hesp. part IV, p. 314; Bridges 1983. Lepid. Hesp. notes on species group names, part 1:92; Mielke, 1993. Rev. Bras. Entomol. 37:622, figs. 93–97;

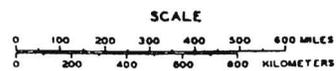
Mielke & Schroeder, 1994. Senckenberg. Biolog. 73:142, fig. 20.

Hylephila bouletti peruana, (lapsus) Shapiro, 1985. Stud. Neotrop. Fauna and Environ. 20:9,10, figs. 5(1), 6(1).

Description. Male. Head. Vestiture buff, tinted orange; eyelash black. Palpi with third segment dorsally black, ventrally buff, distinctly emergent from buff vestiture of second segment. Antennal shaft long, about thrice length of club; club with nudum pale brown, buff proximally, darkening through pale orange to brown at apiculus, and nearly one-half length of club. **Wings.** Somewhat broad but not stubby or rounded. Forewing average length 13.6 mm [range 12–14 mm] (n = 15). Dorsal surface, stigma broad, microandroconial mass conspicuous, yellow; apical, middle, and lower black brush patches present and united, forming a continuous border around the microandroconial mass, poststigmatal patch broad and conspicuous. Inner edge fulvous subterminal spots usually offset distad from inner

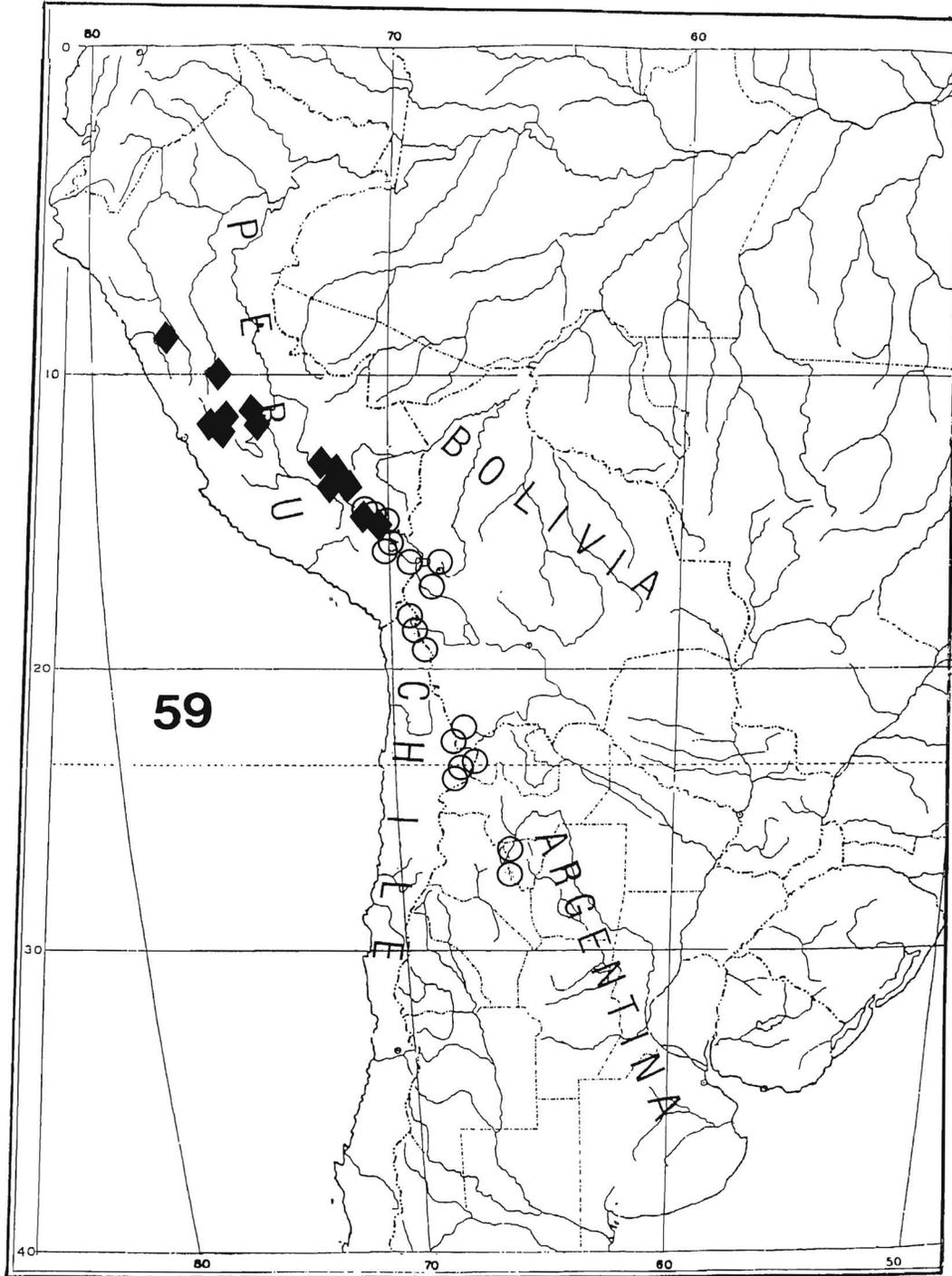


CENTRAL WESTERN SOUTH AMERICA

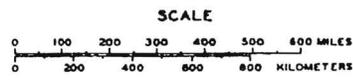


SINUSOIDAL PROJECTION

FIG. 58. Distribution map for eight species of *Hylephila*: Solid diamond = *H. herrerae*, new species; outlined triangles = *H. pseudoherrerae*, new species; outlined circles = *H. pallisteri*, new species; outlined squares = *H. blancasi*, new species; outlined diamond = *H. tentativa*, new species; solid circle = *H. shapiroei*, new species; solid inverted triangles = *H. galera*; solid squares = *H. rossi*, new species.



CENTRAL WESTERN SOUTH AMERICA



SINUSOIDAL PROJECTION

FIG. 59. Distribution map for two species of *Hylephila*: Outlined circles = *H. bouletii*; solid diamonds = *H. peruana*.

edge of postmedian macular band. Fulvous broadly warm-orange costad and basad in discal cell, usually extending well into fuscous border along veins, but occasionally border broad and scarcely indented (cf. Figs. 54 and 56). Fringes orange-fulvous. Below, stigma pockets broad; upper element spanning distance between origins of veins Cu1 and Cu2, diverging from discal cell cubitus vein much nearer to vein Cu2 than to vein Cu1 (Fig. 3d). Fulvous more extensive than above, veins R5 to M3 distally whitened. Fringe basally narrowly whitish, then fuscous, then terminally sullied fulvous. Hindwing above orange-fulvous as on forewing; vertex of chevron-shaped postmedian macular band in space M1–M3 usually conspicuously extended basad well into discal cell, and anterior arm present in space Rs–M1. Fringe orange fulvous. Below, fulvous paler than above; veins Rs to M3 whitened but not conspicuously so to naked eye; often a trace of an additional postmedian, elongate, black dash in upper part of space M1–M3. Fringe as on forewing. **Genitalia.** Eighth tergite lateral margin broadly concave mid-length but not distinctly emarginate just before caudal margin (Fig. 5e); terminal bristle-sockets enlarged and rounded just before caudal margin (Fig. 8). Valva (Fig. 25) in lateral view somewhat broad, ventral margin proximally convex, basal margin scarcely convex, dorsal and ventral margins caudally concave to caudal beak where knobs dorsad of horizontal cleft numerous; length basal margin greater than one and one-half times depth of valva. Penis proximally nearly straight or slightly curved dorsad, its length slightly exceeding length of genital capsule and nearly twice length of valva; titillators asymmetric, the left large, laterally compressed, thorn-like with a very broad base, the right much reduced, thorn-like, both sclerotically strapped to penis; cornuti asymmetric, one narrow, basally elongate, and minutely bidentate, the other basally broad and thorn-like, bidentate. Juxta with ventrocaudal clefts long, about one-half length of juxta; separated median floor reaching caudal margin of juxta. Uncus in dorsal view anteriorly rounded but posteriorly tapered (where minutely serrate) to broad caudal tip that greatly exceeds width of pectines, caudal cleft not exceeding pectines cephalad; pectines minute, length each half medially more than twice its breadth, distinctly tapered mesad anteriorly; the tines conspicuous, few; in lateral view uncus and pectines dorsally nearly flat. Gnathos in lateral view scarcely sclerotized, not divergent ventrally from uncus, scarcely exceeding pectines caudad.

Female. Head. As male but antennal shaft slightly shorter not quite thrice length of club. **Wings.** Orange to tawny fulvous above somewhat more restricted than in male owing to slightly broader fuscous border. Forewing average length 14 mm [range 13–15 mm] ($n = 15$). Below as male, but forewing border usually greatly reduced in spaces M1–M2, M2–M3, and Cu2–2A. **Genitalia.** Eighth sternite in ventral view sclerotized, broad, more or less quadrangular (rounded ventrad in lateral view), with anterior margin straight or emarginate, its length in ventral view nearly or quite one-half its width. Apophysis anterioris somewhat produced cephalad of junction with lamella postvaginalis (Fig. 31). Lamella postvaginalis in ventral view narrowly united, each half produced ventrocephalad forming a slight anterior bulge, not nipple-like, medially not produced ventrally. Antrum dorsally sclerotized, with longitudinal fold, anterolaterally with increased sclerotization just before ductal constriction, ventrally membranous. Ductus bursae well sclerotized, in lateral view massive just beyond deep V-like ductal constriction, in ventral view left lateral pocket slightly produced.

Types. Lectotype ♂ (designated by Mielke 1993:622) in Senckenberg Museum, Frankfurt, Germany [SMF L 4068 (Genit. Präp. O. Mielke #532)]. PERÚ, Cuzco, 4500 m Fig. in Seitz (1923: Taf. 180 f, underside). Paralectotypes. Two specimens (designated by Mielke 1993:622) in Senckenberg Museum, Frankfurt, Germany. 1 ♀ SMF L

4069, Fig. in Seitz (1923: Taf. 180 f); PERÚ, Cuzco, 3500 m. 1 ♂ SMF L 4070, Fig. in Seitz (1923: Taf. 180 f). PERÚ, Cuzco, 4500 m.

Diagnosis and discussion. In the *boulleti* group of *Hylephila*, males of this species are arguably the specimens most easily identified without dissection, because of their conspicuous stigma with its yellow microandromedial mass, their extremely abbreviated uncal pectines (which can often be seen by merely gently brushing the abdominal tip from above), and their distribution in Perú: north and northwest of the department of Puno, where *H. peruana* occurs with several other members of the group (see maps, Figs. 58, 59).

This is the member of the *boulleti* group most commonly collected in Perú. I have seen 22 males and 20 females (18 males, 17 females dissected) from 18 localities in Perú. Flight records suggest perhaps four broods through the year with gaps appearing during March, June, September, and November–December.

Nine ova were dissected from three females (# ♀ 6377, # ♀ 6378, # ♀ 6379) prior to KOH treatment. Two eggs from # ♀ 6377 measured an average 0.75×0.63 mm, and also a pair of eggs from # ♀ 6378 averaged 0.85×0.55 mm. Five ova from # ♀ 6379 averaged 0.83×0.57 mm, and the average of all nine ova is 0.81×0.57 mm. The most common measurement for all the eggs was 0.85×0.55 mm. The eggs were all very similar to eggs of *H. boulleti* including the very weak reticulation at $100 \times$ magnification, although the ova of this species proportionately do not seem to be as highly domed as are those of *H. boulleti*.

ACKNOWLEDGMENTS

I am grateful to the following individuals and institutions for providing me with loans of material or information: Lee D. Miller and the Allyn Museum of Entomology (AME), Florida Museum of Natural History, Sarasota, Florida; Fred H. Rindge and The American Museum of Natural History (AMNH), New York, New York; Philip R. Ackery and the Natural History Museum (BMNH), London, England; Paul H. Arnaud Jr. and the California Academy of Sciences (CAS), San Francisco, California; John E. Rawlins and the Carnegie Museum of Natural History (CMNH), Pittsburgh, Pennsylvania; Raúl Cortez and the Instituto de Entomología, Universidad Metropolitana de Ciencias de la Educación (IEUM), Santiago, Chile; the late Abraham Willink and the Instituto de Zoología, Fundación Miguel Lillo (IML), San Miguel de Tucumán, Argentina; Zsolt Bálint and the Hungarian Natural History Museum (HNHM), Budapest, Hungary; Julian P. Donahue and the Natural History Museum of Los Angeles County (LACM), Los Angeles, California; Gerardo Lamas and the Museo Nacional de Historia Natural, Universidad Mayor de San Marcos (MUSM), Lima, Perú; Arthur M. Shapiro and the Bohart Museum of Entomology, University of California (UCD), Davis, California; Olaf H. H. Mielke and the Departamento de Zoología, Universidade Federal do Paraná (UFPC), Curitiba, Brasil; John M. Burns and the National Museum of Natural History, Smithsonian Institution (USNM), Washington, D.C.; and the late Luis E. Peña, Santiago, Chile. I am indebted also to Yu-Feng Hsu of the National Taiwan Normal University, Taipei, Taiwan who hand-carried several of Evans's types to me from the BMNH. Genitalic drawings were expertly detailed by Shannon Bickford, in Fresno, California.

and scanning electron micrographs were produced by Darrell Ubick at the CAS. Arthur Shapiro continued his tireless collecting efforts and observations in South America, and I particularly want to thank Juan Silva of Arica, Chile, Director of CONAF, First Region, for granting A. M. Shapiro the collecting permit that made his efforts in Chile possible. The artwork was partially funded by a CAS In-House Research Fund FY 1994-95 grant, and some of the manuscript and publication costs were covered by CAS Entomology Research Funds. Julie Parinas, Paul Arnaud, and Vincent Lee again repeatedly were tolerant and helpful in solving my many entreaties for assistance with my "new" word processor. John Burns and George Austin very kindly read the manuscript and offered numerous suggestions which much improved the paper, for which I am most grateful. My thanks to them all.

LITERATURE CITED

- BILLBERG, G. T. 1820. Enumeratio insectorum in museo Gust. Joh. Billberg (Holimiae) Gadel. i-iv + 1138 pp.
- BRIDGES, C. A. 1983. Lepidoptera: Hesperidae, Notes on species-group names. Pp. I.1-I.129, II.1-II.41, III.1-III.62, IV.1-IV.30, V.1-V.13. C.A. Bridges, Urbana, Illinois.
- DRAUT, M. 1923. B. Grypocera, breitköpfige Tagfalter. In Seitz, A. (ed.), Die Gross-Schmetterlinge der Erde. 5. Die amerikanischen Tagfalter. Pp. 836-1022, pls. 189-208. Alfred Kern, Stuttgart.
- DYAR, H. G. 1913. Results of the Yale Peruvian expedition of 1911. Lepidoptera. Proc. U.S. Natl. Mus. 45:622-649.
- EVANS, W. H. 1955. A catalogue of the American Hesperidae, indicating the classification and nomenclature adopted in the British Museum (Natural History). Part IV. Hesperinae and Megathyminae. British Museum, London. 499 pp., pls. 54-88.
- HAYWARD, K. J. 1973. Catalogo de los Ropaloceros [sic] Argentinos. Opera Lilloana 23:318 pp.
- LEWIS, G. 1973. Butterflies of the World. Chicago. Pp. (vi)-xiv, 209-312, pls. 1-208.
- MABILLE, P. 1906. Description d'une Hesperide (Lep.). Bull. Soc. Entomol. France, no. 6:67-68.
- MACNEILL, C. D. & J. HERRERA G. 1999. Studies in the genus *Hylephila* Billberg, I. Introduction and the *ignorans* and *venusta* species groups (Hesperidae: Hesperinae). J. Lepid. Soc. 52:277-317.
- MIELKE, O. H. H. 1993. Sobre os tipos de Hesperidae (Lepidoptera) neotropicais descritos por M. Draudt. Rev. Bras. Entomol. 37:611-638.
- MIELKE, O. H. H. & H. G. SCHROEDER. 1994. Insecta: Lepidoptera: Hesperidae von M. Draudt aus der neotropis beschrieben arten. Die typen and typoide des natur-museums Senckenberg Nr. 82. Senckenbergiana Biologica 73:135-158.
- PEÑA G., L. E. & A. J. UGARTE P. 1997. Las mariposas de Chile, the butterflies of Chile. Editorial Universitaria, Santiago. [9] + 357 pp., figs. (on p. 227).
- PLÖTZ, C. 1883. Die Hesperiden-gattung *Hesperia* auct. und ihre arten. Stet. Ent. Zeit. 44:195-233.
- SHAPIRO, A. M. 1985. Behavioral and ecological observations of Peruvian high-Andean Pierid butterflies (Lepidoptera). Stud. on Neotrop. Fauna and Environ. 20:1-133, Figs. 1-6
- . 1993 [1991]. Convergent evolution in western North American and Patagonian skippers (Hesperidae). J. Res. Lepid. 30:162-174, 4 figs.
- . 1994 [1992]. Why are there so few butterflies in the high Andes? J. Res. Lepid. 31:35-56, pls. I-II.

Received for publication 5 April 2001; revised and accepted 7 November 2001.