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## NEW HIGH-ALTITUDE HESPERIINAE FROM MEXICO AND ECUADOR (HESPERIIDAE)

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The usual picture of collecting in the Neotropics involves thoughts of chopping through the jungle and the tremendous diversity of butterflies in great numbers just waiting for the lepidopterist's net. In limited areas this picture is at least partially accurate, but much of the tropical country is not jungle, and in order to sample an area thoroughly the less lush environments must be collected, too. The desert areas are beginning to be better known through the work of many lepidopterists in recent years, and the scrub and savanna areas have been sampled off and on by lepidopterists throughout the tropics.

The montane areas, however, are still poorly collected and are a fertile source of new species, especially in the less spectacular groups, for a variety of reasons. The altitude itself makes collecting difficult and deters many from collecting in the mountains. The weather is seldom conducive to collecting for sun-loving Lepidoptera: in fact, the paucity of decent collecting weather often precludes more than token visits to such localities by transient collectors who are generally on a rigid time schedule. Even if the weather is perfect for collecting, the high altitudes never yield as large a catch as do the lowlands, and this, too, serves to discourage many collectors from trying their luck in the mountains. Related to this last point and the basic reason why so many undescribed species still await discovery in the mountains is the fact that few professional collectors, whose livelihood depends on getting as many specimens as possible in a given time, have collected in these montane areas, and many species have not been encountered by them, whereas most of the lowland species have been taken by the professionals at one time or another. We have long been fascinated by the montane Neotropical habitats and have sent our collectors to as many of these as we could, as well as collecting them ourselves whenever the opportunity arose.

The results of these collections from the high country have been most encouraging (Miller & Miller, 1970); not only have new species been encountered, but also information on some previously described, but very poorly known species has been obtained. It has been our experience that very little that is collected at such high altitude stations is *not* worthwhile, and with the present state of

knowledge we feel free to say that collecting in the high country for any reasonable period of time virtually assures that the lepidopterist will take something new to science or will rediscover a "lost" species. The hesperiids are a particularly fertile source of new information, and we hope that the new genus and the new species described herein will spark enthusiasm in collectors for these areas and will thereby increase our knowledge of the Neotropical fauna.

All of the skippers described below are Hesperinae, belonging to Evans' (1955) groups H, I and M. The arrangement is that of Evans (1955). All are from Mexico and Ecuador.

### *Dalla roeveri*, new species

Figures 1, 2 (♂), 14 (♂ genitalia)

*Male-female:* Sexes similar. Head, thorax and abdomen blackish-brown clothed above with gray-brown hairs, below with dense olive-tan hairs. Antenna brown above ringed with buff, whitish below; club brown above, whitish below; nudum reddish-brown. Palpus clothed with dense blackish-brown hairs above, olive-tan ones below. Legs densely clothed with olive-tan hairs.

Forewing above uniformly fuscous with a coppery sheen, bearing white extradiscal spots in  $R_3$ - $R_1$ ,  $R_1$ - $R_5$  (usually),  $R_5$ - $M_1$ ,  $M_3$ - $Cu_1$  and two in  $Cu_1$ - $Cu_2$ , one in line with other extradiscal spots and one at base of space, just under the cell-spot(s); two (occasionally none or only one) white cell-spots.

Hindwing above fuscous with a slight coppery sheen, sparse brownish-black hairs at base and along veins, with white extradiscal spots in  $Sc+R_1$ - $R_s$  (may be absent),  $M_1$ - $M_2$ ,  $M_2$ - $M_3$  and  $Cu_1$ - $Cu_2$ .

Forewing below fuscous overscaled with fulvous costad and apically and bearing spots as on upper surface, plus an additional white spot at end of cell.

Hindwing below fuscous overscaled with fulvous with two prominent white bars, one from base to end of vein  $M_1$  and one along length of vein 2A, a short white bar along  $M_2$  and submarginal white spots in  $R_s$ - $M_1$ ,  $M_3$ - $Cu_1$  and  $Cu_1$ - $Cu_2$  (occasionally a second set of spots just outside the cell; rarely all spots absent).

Fringes of both wings gray-brown above, darker at the tips, and gray-brown below.

Length of forewing of Holotype ♂ 11.0 mm., those of the 42 ♂ Paratypes ranging from 9.5 to 11.0 mm., averaging 10.3 mm., those of the three ♀ Paratypes ranging from 10.5 to 11.0 mm., averaging 10.8 mm.

♂ genitalia as figured.

Described from 46 specimens, 43 males and three females, from Morelos, Mexico, near the Distrito Federal border.

HOLOTYPE ♂: MEXICO: MORELOS: 5 [road] mi. N. Tres Marias, 3020 m., grassland/parkland forest, 23.viii.1967 (LDM specimen no. 1967-430) (L. D. & J. Y. Miller).

PARATYPES: 42♂ 3♀, same data as Holotype.

The Holotype, 39 male and three female Paratypes will be deposited in the Allyn Museum of Entomology; one male Paratype will be placed in the collection of the Direccion General de la Fauna Silvestre, Mexico, D. F., Mexico; one male Paratype will be placed in the collection of H. A. Freeman, Garland, Texas; and one male Paratype will be placed in the collection of Kilian Roever, Phoenix, Arizona.

We take great pleasure in naming this distinctive skipper for our friend Kilian Roever of Phoenix, Arizona, in recognition of his work and interest in the Hesperiidae, especially the *Dalla-Piruna* complex.

*D. roeveri* will key rather near, but not identical to *D. bubobon* Dyar or *D. pulchra* (Godman) in that the under surface of the hindwing is darker, and the under side of the forewing lacks the whitish shading mentioned by Evans (1955). We have seen the type of *bubobon* and pictures of that of *pulchra*, however, and *D. roeveri* is abundantly distinct from both.

This species seems to be very local. The entire type-series was collected in open grassland with scattered trees along a railroad siding, and the butterflies were not found elsewhere in the area. The field had been lightly grazed by

cattle. There were very few butterfly species present in this locality: *Nymphalis antiopa* (Linné), *Oarisma garita calega* (Godman), two species of *Paratrytone* (see below) and *Hemiargus i. isolus* (Reakirt), in addition to *D. roeveri*, the commonest butterfly. While *D. roeveri* was shy and difficult to approach, some specimens were rather pugnacious toward their own species.

### Nylla, new genus

Figure 13 (♂ venation)

Type species: *Nylla cordillera*, new species.

Antenna greater than half, but less than two-thirds length of forewing costa; club occupying distal third of antenna; apiculus long, greater than width of club; nudum of 12 segments, three on club, nine on apiculus. Palpi erect, second segment subquadrate, third segment short and conical. Mid- and hindtibia with single pairs of spurs. Forewing vein  $Cu_2$  arising much nearer base than end of cell. Forewing with three brands: a sagittate one just above origin of  $Cu_2$  and along cell, a long one below origin of  $Cu_2$  and a small one just below the last brand and above 2A (Fig. 13).

Superficially this genus most closely resembles *Molo* Godman and *Racta* Evans, but certain characteristics separate *Nylla* from either of these or from any other described genus. The brands on the forewing of *Nylla* are not repeated in either *Molo* or *Racta* (neither of which have any brands). The nudum with its 3/9 formula more closely approximates the situation in *Zalomes* Bell, a genus of small, closely related skippers bearing somewhat different brands; *Molo* and *Racta* have a slightly longer apiculus and a nudum formula of 3/10 or 4/10. The male genitalia more closely approximate those of *Racta*.

We incline toward the view that despite the superficial resemblance to *Molo* and *Racta*, *Nylla* is structurally closer to *Zalomes*, which flies with it on the slopes of the Ecuadorian volcanic peaks, and the present genus may be a high-altitude offshoot of *Zalomes*.

Two species have been found which refer to this genus, both known only from montane Ecuador.

### *Nylla cordillera*, new species

Figures 3, 4 (♂), 15 (♂ genitalia)

*Male*: Head, thorax and abdomen blackish-brown covered with olive-fulvous hairs above and mixed tan and fulvous ones below on head and thorax, light tan hairs on ventral surface of abdomen. Antenna and club reddish-brown above, fulvous below; nudum bright orange-fulvous. Palpi olive-fulvous above, mixed tan and fulvous hairs below. Legs clothed with fulvous hairs, light tan ones on inner margins of femur and tibia.

Forewing above fuscous, basal half of costa fulvous (entering upper part of cell) and with an extradiscal fulvous band from  $R_4$ - $R_5$  to middle of inner margin (spots in  $M_3$ - $Cu_1$  and  $Cu_1$ - $Cu_2$  subhyaline).

Hindwing above fuscous with fulvous basal hairs and a broad central fulvous patch partly in cell and extending from  $M_1$ - $M_2$  to 2A-3A, patch distally constricted in  $Cu_1$ - $Cu_2$ .

Forewing below with central blackish-brown area, reddish-fulvous along costa and broadly greenish-gold apically, with pale central band as above, but terminating in  $Cu_2$ -2A.

Hindwing below greenish-gold, anal area blackish-brown and with fulvous cell spot and complete extradiscal series of spots.

Fringes on both surfaces bright fulvous, darkened costally on both wings. Length of forewing of Holotype ♂ 18.0 mm., those of the 20 ♂ Paratypes ranging from 16.0 to 19.0 mm., averaging 17.3 mm.

The ♂ genitalia as illustrated, differing from those of *N. allynorum*, n. sp., chiefly by the coarser teeth at the distal end of the valvae.

*Female*: Quite similar to ♂, but fulvous markings of fore- and hindwings above reduced and markings below more striking than in that sex: fulvous and gold overscaling costally and marginally with fulvous spots from  $R_2$ - $R_3$  to  $M_2$ - $M_3$

in greenish-gold apical patch and pale spotband reduced on forewing; hindwing not as green as in ♂ with reddish-brown discal and extradiscal spots more prominent and gold-brown shading in cell.

Length of forewing of the three ♀ Paratypes range from 19.0 to 10.0 mm., averaging 19.7 mm.

Described from 24 specimens, 21 males and three females from the high mountains of Ecuador.

HOLOTYPE ♂: ECUADOR: COTOPAXI: Milimbanco, 4090 m., vi.1970 (R. de Lafebre); ♂ genitalia slide no. M-2197 (Lee D. Miller).

PARATYPES: 5♂, same data as Holotype; 5♂, same locality and date as Holotype, but 3800 m. elevation; 3♂, same locality as Holotype, 4090 m., i.1971; 1♂ ECUADOR: COTOPAXI: Rio Mulatos, 3800 m., iv.1971; 3♂ ECUADOR: PICHINCHA: La Viudilla, 3500m., vii.1971; 3♂ 3♀, ECUADOR: IMBABURA: Volcan Cotacachi, 3750 m., xi.1971 (all R. de Lafebre).

This species may be distinguished from the next by its smaller size, darker general appearance, the greenish-gold (rather than reddish-gold) aspect of the under surface and by the male genitalia.

Apparently *N. cordillera* is the commoner of the two species in the genus and has been found in more localities to date. The present distribution of this species is the northern half of upland Ecuador, but the Cotacachi locality is so near the Colombian border that we expect *N. cordillera* to be found there in the future. Members of this genus are restricted to the very high Andean peaks, none having been taken below 3500 m., in company with a great many Pronophilini (Satyridae) and only a few other butterflies in this severe (for the tropics) environment.

#### *Nylla allynorum*, new species

Figures 5, 6 (♂), 7, 8 (♀), 16 (♂ genitalia)

*Male*: Head, thorax and abdomen blackish-brown covered above with fulvous hairs; head covered with fulvous hairs below, thorax and abdomen clothed with brighter fulvous hairs. Antenna reddish-fulvous above, fulvous below; nudum rust-brown. Palpi olive-fulvous above, first segment light tan below, second and third segments clothed with fulvous to reddish-fulvous hairs below. Legs covered with olive-fulvous hairs.

Forewing above dark brown with veins narrowly fulvous and costa reddish-fulvous blending into bright fulvous band around end of cell to inner margin, terminating near base; spots in  $M_3-Cu_1$  and  $Cu_1-Cu_2$  subhyaline. Androconial patches more prominent than in *N. cordillera*, much darker than ground color.

Hindwing above dark brown, paler at costa and with veins narrowly fulvous; large central bright fulvous patch outside cell from  $M_1-M_2$  to  $Cu_2-2A$ , nearest margin in  $M_1-M_2$ .

Forewing below posteriorly blackish-brown, reddish-fulvous along costa, grading to gold at apex, with pale band as on upper surface but terminating at 2A; subhyaline spots in  $M_3-Cu_1$  and  $Cu_1-Cu_2$  not contrasting with remainder of band as much as on upper surface.

Hindwing below gold with slight greenish cast, anal stripe blackish-brown with slight fulvous overscaling, with reddish-brown cell spot, complete row of extradiscal spots and marginal spots to  $M_3-Cu_1$ .

Fringes on both wings fulvous above, darker toward apex of forewing and middle of hindwing; fringes below more golden on both wings and darkened as above.

Length of forewing of ♂ Holotype 20.0 mm., that of the single ♂ Paratype 21.0 mm.

The ♂ genitalia as figured, differing from those of *N. cordillera* in the finer valval teeth.

*Female*: Upper surface similar to that of ♂, but duller, with a definite fulvous overscaling of the dark areas and reduced fulvous markings, especially of forewing. Below as in ♂, but with a very strong reddish cast to all elements of pattern.

Length of forewing of the ♀ Paratype 23.0 mm.

Described from three specimens, two males and a female, from the slopes of Volcan Cotopaxi, Ecuador.

HOLOTYPE ♂: ECUADOR: COTOPAXI: Milimbanco, 4090 m., xi.1970 (R. de Lafebre); ♂ genitalia slide M-2217 (Jacqueline Y. Miller).

PARATYPES: 1♂ 1♀, same data as Holotype.

The type-series is in the collection of the Allyn Museum of Entomology.

This species is named for Mr. and Mrs. A. C. Allyn.

The most noticeable characteristics which set this species apart from *N. cordillera* are its larger size, redder general appearance and minor genitalic differences as can be seen in the figures.

So far this species does not appear to be as widespread nor as common as does *N. cordillera* with which the present species is associated at Milimbanco.

### *Paratrytone capta*, new species

Figures 9, 10 (♂), 17 (♂ genitalia)

*Male-female:* Sexes similar: female wings slightly broader. Head, thorax and abdomen dark brown clothed with olive-brown hairs above, olive-tan ones below. Antenna brown above, tan below; nudum fawn-colored. Legs brown with fulvous hairs.

Forewing above warm brown with fulvous overscaling and marked as follows: gold subapical spots in  $R_3$ - $R_4$ ,  $R_4$ - $R_5$  and  $R_5$ - $M_1$ ; extradiscal fulvous spots in  $M_2$ - $M_3$  (small),  $M_3$ - $Cu_1$  and  $Cu_1$ - $Cu_2$  (occasionally a faint one in  $Cu_2$ -2A); no cell spot.

Hindwing above warm brown with fulvous hairs basally and in posterior half of wing, bearing small fulvous extradiscal spots in  $M_1$ - $M_2$  (always),  $M_2$ - $M_3$  and  $M_3$ - $Cu_1$ .

Forewing below fulvous along costa, around and within cell, reddish-brown at apex (with a few white scales in  $R_4$ - $R_5$ ) and marginally and dark brown in posterior half of wing, with markings as follows: three white subapical spots, a gold extradiscal spot in  $M_2$ - $M_3$ , subhyaline fulvous extradiscal spots in  $M_3$ - $Cu_1$  and  $Cu_1$ - $Cu_2$  and a small fulvous streak in  $Cu_2$ -2A.

Hindwing below reddish-brown with white scaling along costa and margin, fulvous scaling humerally, at end of cell and near tornus and with a broken white spotband from  $Sc+R_1$ - $Rs$  to  $Cu_2$ -2A, nearest base in  $Sc+R_1$ - $Rs$  and  $Cu_1$ - $Cu_2$  nearest margin in  $M_1$ - $M_2$  and  $Cu_2$ -2A.

Fringes on both surfaces of both wings fulvous at anal angle, shading to brown powdered with gray toward costa.

Length of forewing of Holotype ♂ 16.0 mm., those of the two ♂ Paratypes 15.5 and 16.5 mm., that of the single ♀ Paratype 16.5 mm.

The ♂ genitalia as figured, differing from those of *P. monticola* (Godman) in the configuration of the valva (for comparison see Godman and Salvin, 1879-1901: pl. 94, fig. 39). We have verified the genitalic configuration shown in that plate by a dissection of a specimen from Godman of *P. monticola* in the collection of Carnegie Museum.

Described from four specimens, three males and a female, from Hidalgo, Mexico.

HOLOTYPE ♂: MEXICO: HIDALGO: vic. El Encarnación, 2400-2450 m., oak-pine forest, 16.ii.1969 (L. D. & J. Y. Miller); ♂ genitalia slide M-2188 (Lee D. Miller).

PARATYPES: 1♂ 1♀, same data as Holotype; 1♂, same locality, but 15.ii. 1969.

The type-series is in the collection of the Allyn Museum of Entomology.

This species is very near both *P. monticola* and *P. niveolimbus* (Mabille), resembling the former more superficially and the later perhaps more genitally (see figure of *P. niveolimbus* genitalia in Godman and Salvin, 1879-1901: pl. 94, fig. 43). Both of these species have unmarked hindwings above, however, whereas *P. capta* always has at least one and often three small extradiscal dots.

The present species was not common at the El Encarnación locality, and the few specimens that were taken were collected on rocks in the underbrush of this pine-oak forest (described in more detail in Miller and Miller, 1970, and Clench, 1971). They were difficult to approach and did not seem as pugnacious as some *Paratrytone* we have encountered.

It is interesting to note that members of this genus are with few exceptions restricted to only a few localities per species, and when new localities are discovered for *Paratrytone* they will frequently produce an entirely different species, or at most two. Speciation seems to be a rather common occurrence in these butterflies. The El Encarnación locality produced several new or poorly known

species in addition to *P. capta*: the endemic *Polygonia haroldi* (C. & R. Felder), the rare *Adelpha donysa* (Hewitson) and *creton* (Godman) and new *Mitoura* being described by Harry K. Clench, to name just a few.

**Paratrytone decepta**, new species

Figures 11, 12 (♂), 18 (♂ genitalia)

*Male*: Head, thorax and abdomen brownish-black clothed with gray-brown hairs above, gray-tan ones below. Antenna brown above, tan ringed with brown below; nudum fawn-colored. Palpi brown above, pale gray-tan below. Legs clothed with gray hairs.

Forewing above fuscous with a hyaline double cell spot, three large, hyaline subapical spots in  $R_3$ - $R_4$ ,  $R_4$ - $R_5$  and  $R_5$ - $M_1$ , two hyaline extradiscal spots in  $M_2$ - $Cu_1$  and  $Cu_1$ - $Cu_2$  and a fulvous spot in  $Cu_2$ -2A; black androconial patch from origin of  $Cu_1$  to center of 2A.

Hindwing above fuscous with a faint fulvous spot at end of cell and a curved extradiscal fulvous spotband from  $Rs$ - $M_1$  to  $Cu_1$ - $Cu_2$  (spot in  $Rs$ - $M_1$  very small).

Forewing below fuscous, darker posterior of cell, with fulvous overscaling along costa and spots of upper surface repeated below (spot in  $Cu_2$ -2A more diffuse than above and cream-colored).

Hindwing below fuscous overscaled with fulvous with a white cell end spot and a smooth curved row of white coalesced extradiscal spots from  $Sc+R_1$ - $Rs$  to  $Cu_2$ -2A; anal fold darker.

Fringes above and below on the single specimen mostly missing, but those present are fuscous.

Length of forewing of Holotype ♂ 15.5 mm.

The ♂ genitalia as figured, differing from Evans' (1955: pl. 78) figure of those of *P. polyclea* (Godman) in the stouter uncus + tegumen and the recurved, toothed dorsal process of the valva.

*Female*: Unknown.

Described from a single worn male from the mountains of Morelos, Mexico.

HOLOTYPE ♂: MÉXICO: MORELOS: 5 [road] mi. N. Tres Marias, 3020 m., grassland/parkland forest, 23.viii.1967 (L. D. & J. Y. Miller); ♂ genitalia slide M-2187 (Lee D. Miller).

The Holotype will be placed in the Allyn Museum of Entomology collection.

*P. decepta* is near, but apparently not identical with *P. polyclea* and is separated from it in the description. We have not seen the unique type of Godman's species recently, (LDM briefly examined it in 1964 and compared it with the Figure in Godman and Salvin, 1879: pl. 93, figs. 44, 45), but the figure is accurate and the present species differs in the relative sizes and positions of several spots, as well as genitally.

This specimen, along with *P. aphractioia* Dyar, *Dalla roeveri* and one other specimen that we have been unable to place, was taken on one of those rare cloudless days in the high country south of Mexico City. No essential behavioral differences were noted between *P. decepta*, *P. aphractioia* or the unknown beast - all were pugnacious, nervous skippers which were best taken along the railroad cut where they would occasionally perch on grass or even on stones.

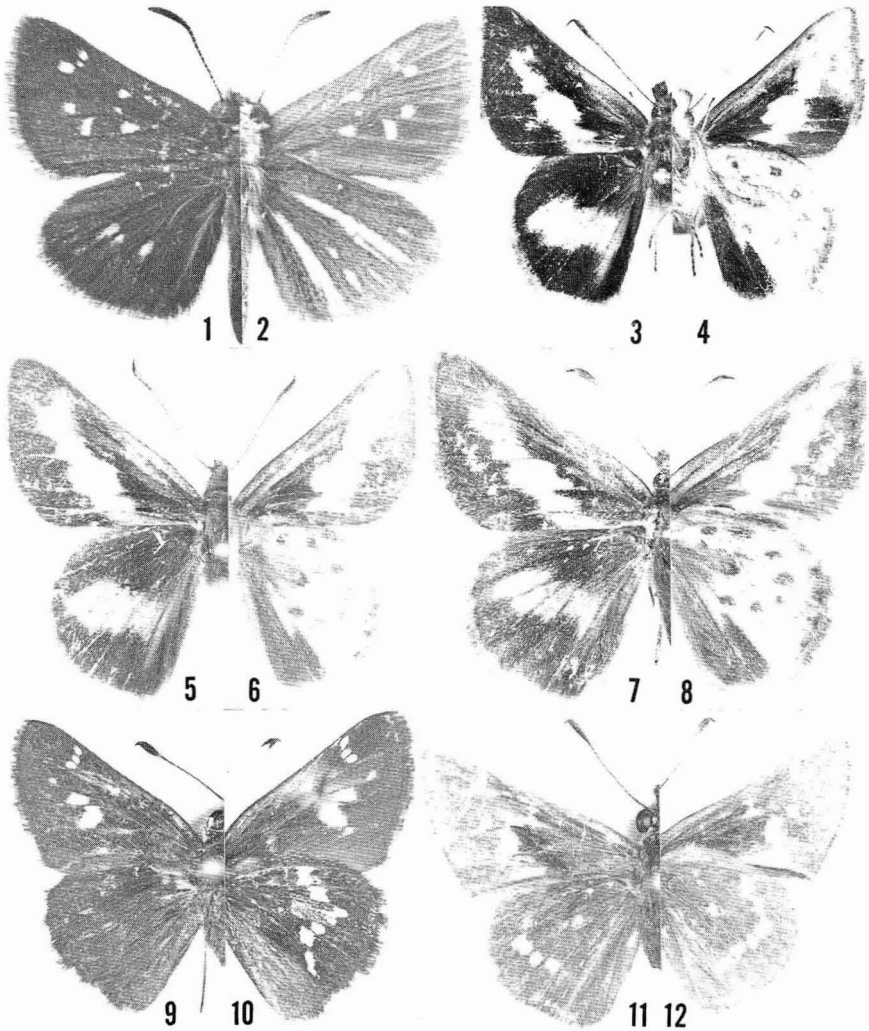
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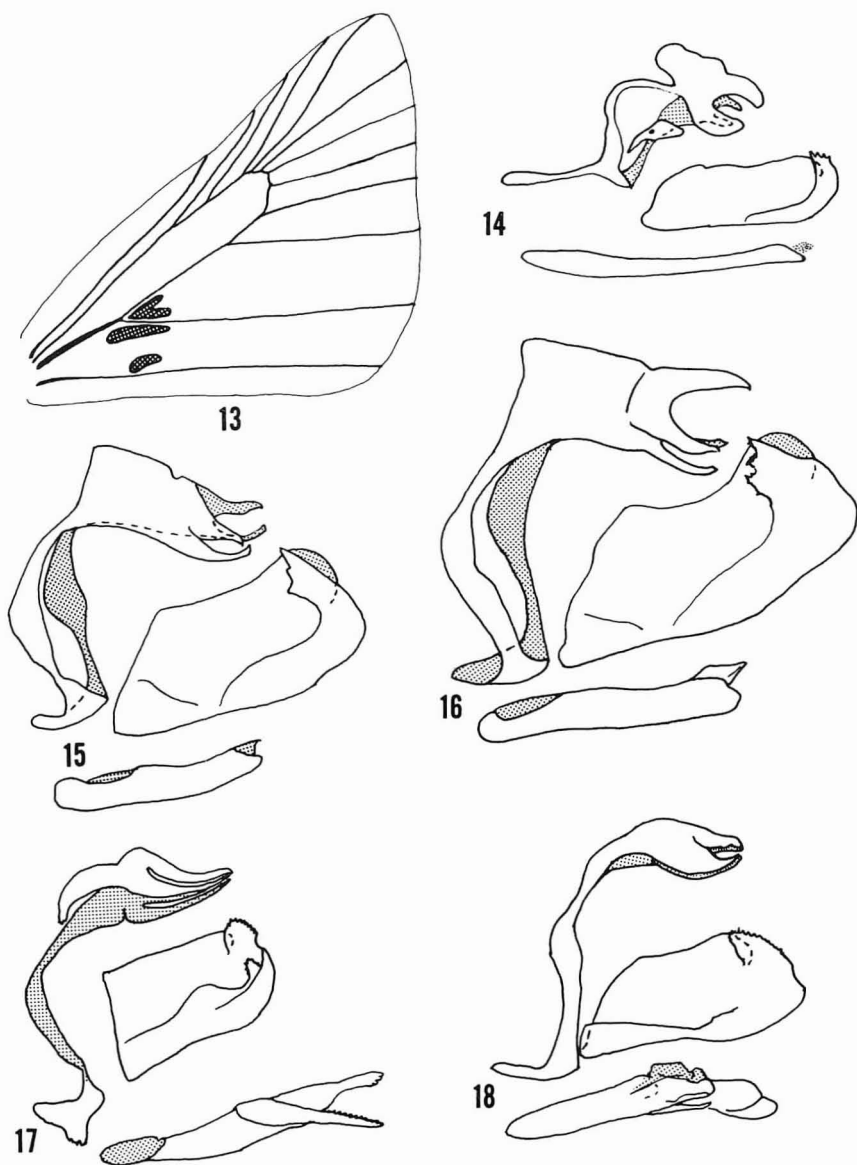
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Figures 1-12, new Neotropical Hesperiidae. 1-2, *Dalla roeveri*, new species, Holotype ♂ upper (1) and under (2) surfaces; MEXICO: MORELOS: vic. Tres Marias. 3-4, *Nylla cordillera*, new species, Holotype ♂ upper (3) and under (4) surfaces; ECUADOR: COTOPAXI: Milimbanco. 5-6, *Nylla allynorum*, new species, Holotype ♂ upper (5) and under (6) surfaces; ECUADOR: COTOPAXI: Milimbanco. 7-8, Same, Paratype ♀ upper (7) and under (8) surfaces; ECUADOR: COTOPAXI: Milimbanco. 9-10, *Paratrytone capta*, new species, Holotype ♂ upper (9) and under (10) surfaces; MEXICO: HIDALGO: vic. El Encarnación. 11-12, *Paratrytone decepta*, new species, Holotype ♂ upper (11) and under (12) surfaces; MEXICO: MORELOS: vic. Tres Marias.





Figures 13-18, new Neotropical Hesperiiidae. 13, *Nylla*, new genus, ♂ forewing venation; stippling on this figure only indicates androconial patches. 14, *Dalla roeveri*, new species, Paratype ♂ genitalia (slide M-2121). 15, *Nylla cordillera*, new species, Holotype ♂ genitalia (slide M-2197). 16, *Nylla allynorum*, new species, Paratype ♂ genitalia (slide M-2198). 17, *Paratrytone capta*, new species, Holotype ♂ genitalia (slide M-2188). 18, *Paratrytone decepta*, new species, Holotype ♂ genitalia (slide M-2187).