

## SIX NEW SPECIES OF HESPERIIDAE FROM MEXICO

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During the process of conducting research on the HesperIIDae of Mexico, several undescribed species recently have been found, six of which are described in this article.

***Pyrrhopyge hoffmanni* Freeman, new species**

Figs. 3, 4, 17

**Male** (Upper side). Primaries black with an orange-yellow spot near base in space 1b, the upper half of the spot is orange and the lower half yellow. There is a circular spot in space 1b situated directly below the spot in space 2. The cell is linear and situated inward from the oval shaped spot in space 2. There is a linear spot in space 3 and another in space 4. The four apical spots form an even curve starting with one in space 6 and extending to space 9. All spots are sordid white. Fringes white, black at end of veins.

Secondaries black, with the outer margin somewhat crenulate. Fringes white, black at ends of veins.

**Male** (Under side). Primaries black. There is a narrow orange streak in space 1a. In space 1b and the cell near the base there is an orange area. The costa from the base to near mid wing is bright orange. The discal and apical hyaline spots are well developed and are clear white. The veins are somewhat lighter than the ground color.

Secondaries black with a bright orange basal area covering somewhat less than one half of the wing. There is a distinct black cell spot and one specimen has another black spot below the cell spot. There is a narrow black line at the base of the wing. The veins are somewhat lighter than the ground color.

Thorax above black with an orange spot on each side below the head, beneath black and orange striped. Abdomen black above, orange and black striped beneath. Head black, white spotted. Palpi black, with distinct white outer areas and white spotted cheeks. Legs black and orange. Antennae, both shaft and club, solid black.

**Wing measurements.** Primaries: base to apex, 25 mm; apex to outer angle, 17 mm; outer angle to base, 19 mm. Secondaries: base to end of vein 3, 15 mm; center of costa to anal angle, 18 mm. Total expanse, 48 mm.

**Female.** Very similar to the male. The only difference is the less crenulate secondaries and the larger size.

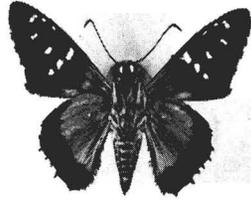
**Wing measurements.** Primaries: base to apex, 32 mm; apex to outer angle, 22 mm; outer angle to base, 22 mm. Secondaries: base to end of vein 3, 22 mm; center of costa to anal angle, 22 mm. Total expanse, 55 mm.

**Type material.** Holotype, male, Tenosique, Tabasco, Mexico, 3 September 1962 (E. C. Welling collector), will be placed in the American Museum of Natural History, New York. Allotype, female, Chimalapa, Oaxaca, Mexico, September 1965 (T. Escalante collector), is in my collection. There are three male paratypes from Tenosique, Tabasco, one collected 18 August 1962, one 26 August 1962, and the other 7 September 1962, and one male paratype from Middlesex, Stann Ck. District, British Honduras, 24 March 1965. All paratypes were collected by E. C. Welling.

This new species is named for the late C. C. Hoffmann, who did so much to increase our knowledge of the Mexican Rhopalocera.



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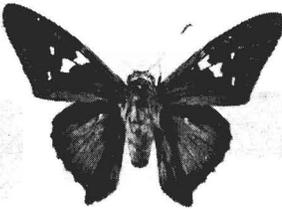
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*Pyrrhopyge hoffmanni* belongs in the *maculosa* group of Evans (1951). His concept of there being but two species in this group is completely in error. Actually with the discovery of *hoffmanni* there are now six species present, four occur in Mexico, *mulleri* Bell, *erythrosticta* Godman & Salvin (Figs. 1 & 2), *hoffmanni* and *araxes* Hewitson and its subspecies *arizonae* Godman & Salvin. *Maculosa* Hewitson and *cossaea* Druce are found in Colombia. *Mulleri*, *erythrosticta*, and *hoffmanni* fly in the same general area in Tabasco, Veracruz and Oaxaca. Besides differences in the genitalia *hoffmanni* can be separated easily from *mulleri* by the following differences: (1) *mulleri* lacks hyaline spots on the primaries; (2) *mulleri* lacks the cell spot on the lower surface of the secondaries which is present in the orange basal area of *hoffmanni*; and (3) *hoffmanni* is slightly smaller than *mulleri*. *Hoffmanni* differs from *erythrosticta* in the following ways: (1) the discal spots on the primaries of *erythrosticta* in spaces 1b, 2, and the cell form a straight line, whereas in *hoffmanni* the spot in space 2 is displaced outward from the other spots, not forming a straight line; (2) the basal orange area on the lower surface of the secondaries is much more extensive in *erythrosticta* covering approximately two thirds of the wing, while in *hoffmanni* it covers less than one half of the wing; (3) there is no cell spot in the orange area of *erythrosticta* which is present in *hoffmanni*; (4) the orange-red spot near the base of the primaries on the upper side in space 1b is solid deep orange-red in *erythrosticta*, while in *hoffmanni* the upper half is orange and the lower half is yellow; and (5) *erythrosticta* lacks the orange spots on the thorax just below the head which are present in *hoffmanni*.

### ***Epargyreus deleoni* Freeman, new species**

Figs. 5, 6, 18

**Male** (Upper side). Primaries light brown, with the discal spots yellowish-orange; spot in 1b linear, midway between the outer margin spot in space 2; spot in space 2 broader at the top than bottom, overlapping midway the cell spot; cell spot broader at the top than bottom; spot in space 3 small and linear. There are two minute linear spots over the outer edge of the cell spot. There is one minute apical spot. Basal and discal areas including space 1a heavily overscaled with golden-yellow scales. Costal fold well developed. Fringes yellowish-brown.

Secondaries yellowish-brown, heavily overscaled with golden-yellow scales over

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Figs. 1, 2. *Pyrrhopyge erythrosticta* Godman & Salvin. Male. Middlesex, Stann Ck., Dist., British Honduras, 24 August 1965 (E. C. Welling; H. A. F.).

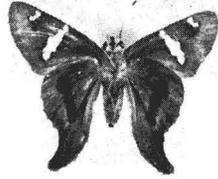
Figs. 3, 4. *Pyrrhopyge hoffmanni*, n. sp. Holotype, male, Tenosique, Tabasco, Mexico, 3 September (E. C. Welling; A. M. N. H.).

Figs. 5, 6. *Epargyreus deleoni*, n. sp. Holotype, male, X-Can, Quintana Roo, Mexico, 13 June 1969 (E. C. Welling; A. M. N. H.).

Figs. 7, 8. *Typhedanus salas*, n. sp. Holotype, male, Piste, Yucatan, Mexico, 26 August 1968 (E. C. Welling; A. M. N. H.).



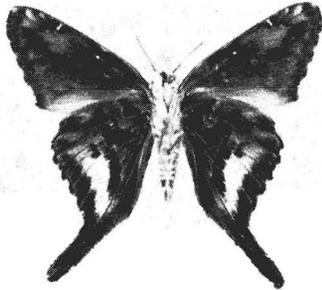
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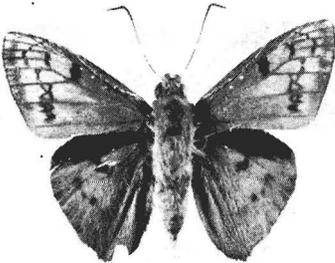
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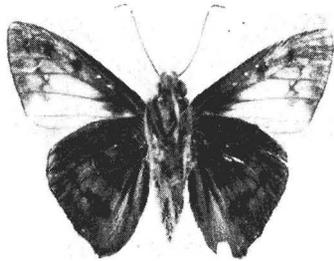
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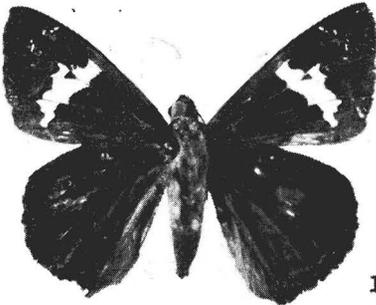
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the basal and discal areas to near the outer margin. Fringes yellowish-brown, brown at ends of the veins.

**Male** (Under side). Primaries, light brown, with a purplish wash over the apical and outer cellular areas. Space 1a light tan. The hyaline spots are yellowish-brown.

Secondaries dark chocolate brown over basal and discal areas. Outer margin grayish with a purplish sheen. Discal spots narrow, beginning at space 1b and extending in a straight line to space 7. The spot in space 3 extends slightly outward. The spots extending through cell and above, narrow and linear. All spots silvery-white. There is an indistinct band beginning at space 1b and running in an irregular manner just outside the silvery, discal band, terminating at the upper edge of the cell.

Thorax golden-brown above, dark brown beneath. Abdomen golden-brown above, lighter brown beneath, with indistinct segmental striping. Head golden-brown. Palpi chestnut brown. Legs tan. Antennae, shaft light brown above and below, club slightly darker.

**Wing measurements.** Primaries: base to apex, 27 mm; apex to outer angle, 18 mm; outer angle to base, 17 mm. Secondaries: base to end of vein 3, 15 mm; center of costa to anal angle, 21 mm. Total expanse, 51 mm.

**Female** (Upper side). Primaries brown, with some golden-yellow overscaling near base and midway to discal band. Discal spots yellowish-brown, similar to those in the male except larger and there is a distinct costal spot above the cell spot and there are three apical spots, lower one is minute and displaced outward from the other two.

Secondaries brown, heavily overscaled with golden-yellow scales over the basal and to near the discal areas. Fringes sordid white and brown at ends of veins.

**Female** (Under side). Very similar to the male except there is a broad grayish marginal area on both the primaries and secondaries.

Thorax golden-brown above, dark brown beneath. Abdomen brown above, grayish-white striped beneath. Head golden brown. Palpi sordid yellowish-white. Legs and antennae same as in the male.

**Wing measurements.** Primaries: base to apex, 31.5 mm; apex to outer angle, 20 mm; outer angle to base, 20 mm. Secondaries: base to end of vein 3, 19 mm; center of costa to anal angle, 24 mm. Total expanse, 61 mm.

**Type material.** Holotype, male, X-Can, Quintana Roo, Mexico, 13 June 1969 (E. C. Welling collector), will be placed in the American Museum of Natural History. Allotype, female, X-Can, Quintana Roo, Mexico, 7 June 1967 (E. C. Welling collector), is in my collection. There is one female paratype, Chichen Itza, Yucatan, Mexico, 1 November 1930 (F. M. Gaige collector), will remain for the present in my collection.

This new species is named for my good friend Lorenzo DeLeon of Cuidad Valles, S. L. P., Mexico, the golf professional at Hotel Covadonga.

Superficially above this new species slightly resembles *E. windi* Free-

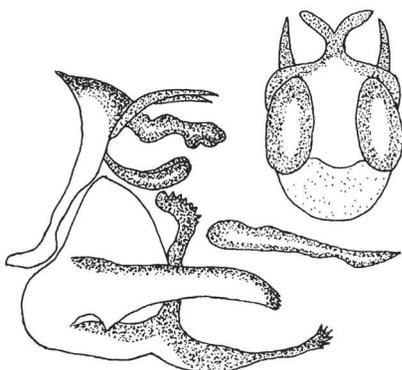
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Figs. 9, 10. *Polythrix guatemalaensis*, n. sp. Allotype, female, X-Can, Quintana Roo, Mexico, 26 July 1962 (E. C. Welling; H. A. F.).

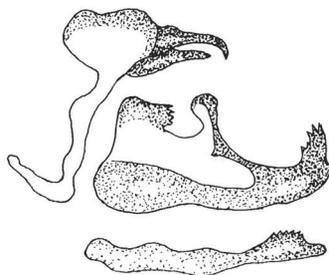
Figs. 11, 12. *Codatractus yucatanus*, n. sp. Holotype, female, Piste, Yucatan, Mexico, 1 September 1967 (E. C. Welling; A. M. N. H.).

Figs. 13, 14. *Bungalotis milleri*, n. sp. Holotype, male, Candelaria Loxicha, Oaxaca, Mexico, 22 September 1968 (E. C. Welling; A. M. N. H.).

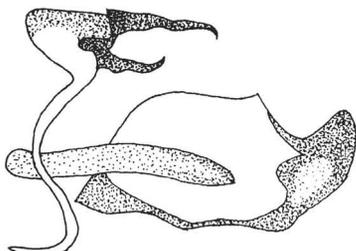
Figs. 15, 16. *Bungalotis milleri*, n. sp. Allotype, female, San Quintin, Chiapas, Mexico, 16 September 1970 (Robert Wind; Allyn Museum).



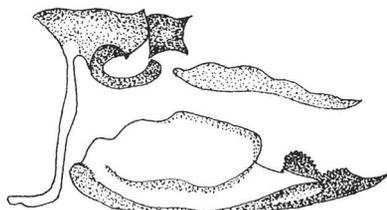
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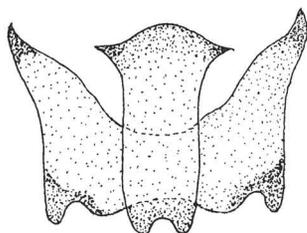
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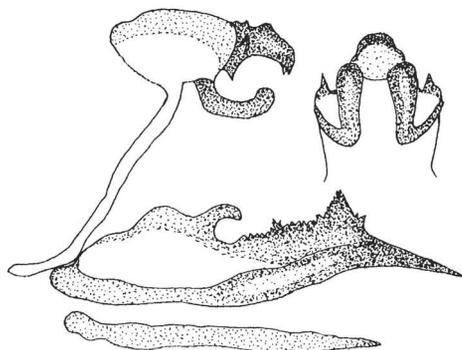
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Fig. 17. Male genitalia. *Pyrrhopyge hoffmanni*, n. sp. Paratype, Tenosique, Tabasco, Mexico, 18 August 1962 (E. C. Welling; H. A. F.).

Fig. 18. Male genitalia. *Epargyreus deleoni*, n. sp. Holotype, X-Can, Quintana Roo, Mexico, 13 June 1969 (E. C. Welling; A. M. N. H.).

Fig. 19. Male genitalia. *Typhedanus salas*, n. sp. Paratype, Piste, Yucatan, Mexico, 29 August 1968 (E. C. Welling; H. A. F.).

Fig. 20. Male genitalia. *Polythrix guatemalaensis*, n. sp. Holotype, Sayaxche, El Petan, Guatemala, 23 August 1963 (E. C. Welling; A. M. N. H.).

man, however, on the lower surface it does not resemble any other species of *Epargyreus* due to the unusual arrangement of the silvery-white discal band.

***Typhedanus salas* Freeman, new species**

Figs. 7, 8, 19

**Male** (Upper side). Primaries dark brown. There is a dark, straight band of spots between the base and the discal band, extending from space 1b to near the costa. There is a dark discal band which is broken outward at vein 3 and is irregularly continuous with the dark apical band. Fringes dark brown.

Secondaries dark brown, with the slightest indication of a discal band. There is a prominent radiating hair tuft arising from near the base of space 1c, which is yellowish in coloration. The remainder of the wing dark brown. Fringes sordid yellowish-white, unchecked.

**Male** (Under side). Primaries similar to above except space 1a is yellowish.

Secondaries similar to above except the discal bands are darker.

Thorax dark brown above and beneath. Abdomen dark brown above and beneath. Head dark brown. Palpi light brown. Legs dark brown. Antennae, shaft dark brown, club dark brown with the apiculus orange.

**Wing measurements.** Primaries: base to apex, 22 mm; apex to outer angle, 15 mm; outer angle to base, 15 mm. Secondaries: base to end of vein 3, 14 mm; center of costa to anal angle, 18 mm. Total expanse, 39 mm.

**Female.** Very similar to the male, the only difference is on the lower surface of the secondaries near the anal angle where it is a slight degree lighter brown.

**Wing measurements.** Primaries: base to apex, 26 mm; apex to outer angle, 17 mm; outer angle to base, 19 mm. Secondaries: base to end of vein 3, 18 mm; center of costa to anal angle, 17 mm. Total expanse, 47 mm.

**Type material.** Holotype, male, Piste, Yucatan, Mexico, 26 August 1968, will be placed in the American Museum of Natural History. Allotype, female, same location, 16 August 1968, is in my collection. There are nine male paratypes and one female paratype from the same area in my collection. All specimens were collected by E. C. Welling.

This new species is named for Felipe Salas, Assistant Manager of Hotel Covadonga, Ciudad Valles, S. L. P., Mexico, who helped me with my collecting in that area of Mexico.

This new species resembles *Typhedanus ampyx* Godman & Salvin except it lacks all of the bright yellow coloration on both surfaces of the secondaries, is somewhat smaller and there are differences in the genitalia. Both species fly together in Yucatan.

***Polythrix guatemalensis* Freeman, new species**

Figs. 9, 10, 20

**Male** (Upper side). Primaries dark brown. There is a rather compact discal band of four yellow, hyaline spots. The spot in space 2 is large and square. There

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Fig. 21. Female genitalia. *Codatractus yucatanus*, n. sp. Paratype, Piste, Yucatan, Mexico, 2 August 1967 (E. C. Welling; H. A. F.).

Fig. 22. Male genitalia. *Bungalotis milleri*, n. sp. Paratype, Candelaria Loxicha, Oaxaca, Mexico, 5 August 1969 (E. C. Welling; H. A. F.).

is a small spot in space 1b directly under the outer edge of the spot in space 2. In space 3 there is a small spot directly over the outer edge of the spot in space 2, and the inner edge of the cell spot, and the inner edge of the spot in space 2 form an even straight line. There are three apical spots, one in space 6 is larger than the one in space 8, while the one in space 7 is small. The inner edge of the three spots forms an even curve. The costal fold is well developed. Fringes dark brown, concolorous with rest of wing.

Secondaries dark brown. The lower half of each wing rather badly torn thus not indicating the tail length. Fringes dark brown.

**Male** (Under side). Similar to above except slightly lighter in coloration and there is a dark area just beneath the apical spots. The veins are slightly lighter than the ground color.

Secondaries brown. There is a dark cell spot and another one just above it. The discal row of spots from 1B to the cell are dark black and very prominent. The veins are slightly lighter than the ground color.

Thorax brown above with some yellowish hair-like scales intermixed, beneath brown. Abdomen brown above and beneath. Head brown with some yellowish hair-like scales intermixed. Palpi yellowish-brown. Legs brown. Antennae, shaft and club, brown above, yellowish beneath.

**Wing measurements.** Primaries: base to apex, 21 mm; apex to outer angle, 15 mm; outer angle to base, 19 mm. Secondaries: base to end of vein 3, 13 mm; center of costa to anal angle uncertain due to damage of both wings. Total expanse, 41 mm.

**Female** (Upper side). Primaries very similar to male except there is a distinct costal spot directly over the cell spot. Fringes tan, lighter than the rest of the wing.

Secondaries dark brown. Tails broad and fairly short (5 mm), evenly curved outward. Fringes sordid white, slightly darker at ends of veins.

**Female** (Under side). Very similar to the male.

Thorax, abdomen, head, palpi, legs, and antennae similar to male.

**Wing measurements.** Primaries: base to apex, 22 mm; apex to outer angle, 15 mm; outer angle to base, 15 mm. Secondaries: base to end of vein 3, 14 mm; center of costa to anal angle (end of tail), 23 mm. Total expanse, 43 mm.

**Type material.** Holotype, male, Sayaaxche, El Petan, Guatemala, 23 August 1963, will be placed in the American Museum of Natural History. Allotype, female, X-Can, Quintana Roo, Mexico, 26 July 1962, will remain for the present in my collection. Both specimens were collected by E. C. Welling.

This new species resembles *Polythrix procerus* (Ploetz) on the upper side except in *guatemalaensis* the discal spots are slightly darker and form a more compact band. On the lower surface they do not resemble each other at all due to the very dark cell spot and discal band of *guatemalaensis* on the secondaries. The nearest related species appears to be *P. callias* (Mabille) from Bolivia as there is some similarity in the dark macular bands on the lower surface of the secondaries. The genitalia are distinct.

### **Codatractus yucatanus** Freeman, **new species**

Figs. 11, 12, 21

**Female** (Upper side). Primaries uniform dark brown, immaculate except for two indistinct apical spots in spaces 8 and 9. Fringes indistinctly checkered dark and light brown.

Secondaries uniform dark brown, immaculate. Tails approximately 14 mm in length. Fringes indistinctly checkered and light brown.

**Female** (Under side). Primaries varying shades of brown, somewhat resembling *Codatractus carlos* Evans, except there are no hyaline spots present except two minute apical ones in spaces 8 and 9. The entire coloration is darker than *carlos* and the cellular light area is more extensive.

Secondaries dark brown with heavy black basal and discal markings. The white discal area is similar to that in *C. alcaeus* (Hew.) and not extending as far upward as in *carlos*. There is a dark bar at the upper end of the white discal area. The veins are slightly lighter than the ground color.

Thorax dark brown above, light, yellowish-brown beneath. Abdomen dark brown above, striped yellowish and brown beneath. Head brown, with a white line at the base of the eyes. Palpi sordid yellowish-white. Legs light brown. Antennae, shaft and club dark brown above, beneath shaft minutely striped yellow and brown, club bright yellow.

**Wing measurements.** Primaries: base to apex, 31 mm; apex to outer angle, 20 mm; outer angle to base, 23 mm. Secondaries: base to end of vein 3, 21 mm; center of costa to anal angle (end of tail), 35 mm. Total expanse, 58 mm.

**Type material.** Holotype, female, Piste, Yucatan, Mexico, 1 September 1967, will be placed in the American Museum of Natural History. There are eight female paratypes from the same location, collected during June, July, August and September 1967 and 1968, in my collection. All specimens were collected by E. C. Welling.

On the upper surface this species does not resemble any other member of the genus *Codatractus* due to the absence of hyaline spots. On the lower surface it resembles both *carlos* and *alcaeus* based entirely on ground color.

### **Bungalotis milleri** Freeman, **new species**

Figs. 13, 14, 15, 16, 22

**Male** (Upper side). Primaries bright orange-fulvous. No hyaline spots. There is a dark brownish-black cell spot. At the end of the cell there is a dark bar and another dark bar midway between the end of the cell and the apical area forming a portion of an evenly curved row of dark apical spots. In spaces 1a and 1b there are two circular dark spots, directly above in space 2 there is a dark marking resembling the letter "B," above this spot is a dark bar midway between the bar at the end of the cell and the one forming the lower portion of the apical spots. There is a distinct costal fold. Fringes dark brown.

Secondaries, costa uniform dark brown with no brilliant blue in side light, remainder of wing bright orange-fulvous. There is a dark cell spot and a row of rather indistinct discal spots. Fringes dark brown.

**Male** (Upper side). Primaries, costa, apical area and outer margin to midway of space 1 dark brown, remainder of wing bright orange-fulvous. The spots reappear but are much less distinctive.

Secondaries dark brown with some orange-fulvous scales between the dark discal markings which are much more pronounced on this surface of the wing.

Thorax above bright orange-fulvous, brown below. Abdomen above bright orange-fulvous, below approximately the same. Head orange-fulvous. Palpi and cheeks dark tawny with some lighter scales beneath the eyes. Legs light brown. Antennae, shaft both above and below dark brown, club brown, with the terminal end of the apiculus light orange both above and below.

**Wing measurements.** Primaries: base to apex, 30 mm; apex to outer angle,

20 mm; outer angle to base, 23 mm. Secondaries: base to end of vein 3, 20.5 mm; center of costa to anal angle, 26 mm. Total expanse, 60 mm.

**Female** (Upper side). Primaries dark brownish-black, with a central band of white, hyaline spots from space 1b to cell, with a detached but approximate spot in space 3. There is a minute, linear spot in space 4 midway between the spot in space 3 and the outer margin, and a minute dot in space 5. There are three apical spots forming a straight line pointing toward the upper fifth of the outer margin. Fringes concolorous with rest of wing.

Secondaries, unmarked, dark brownish-black. Fringes concolorous with rest of wing.

**Female** (Under side). Very similar to above except space 1b is bright yellowish. Secondaries dark brownish-black with some gray discal and subbasal spots. There are two spots below the costa that are somewhat lighter in coloration than the others.

Thorax and abdomen dark brown above and below. Head dark brown. Palpi and cheeks dark brown, with the slightest indication of some lighter scales below the eyes. Legs dark brown. Antennae, shaft and club, dark brown, with the apiculus slightly lighter.

**Wing measurements.** Primaries: base to apex, 40 mm; apex to outer angle, 25 mm; outer angle to base, 34 mm. Secondaries: base to end of vein 3, 30 mm; center of costa to anal angle, 27 mm. Total expanse, 67 mm.

**Type material.** Holotype, male, Candelaria Loxicha, Oaxaca, Mexico, 22 September 1968, will be placed in the American Museum of Natural History. This specimen and two male paratypes from the same location were collected by E. C. Welling. Allotype, female, San Quintin, Chiapas, Mexico, 16 September 1970, collected by Robert Wind, is in the Allyn Museum of Entomology, Sarasota, Florida. The two male paratypes from Candelaria Loxicha are in my collection. There is a male paratype in the American Museum of Natural History from Rancho San Carlos, Chiapas, collected August 1968 by Peter Hubbell. There are single male and female paratypes collected 15 November 1971 by Peter Hubbell at Catemaco, Veracruz, Mexico, in the collection of Dr. W. W. McGuire, San Antonio, Texas.

This new species is named for Dr. Lee Miller, Allyn Museum of Entomology, Sarasota, Florida, for his outstanding work on the Rhopalocera.

This new species does not fit any of the known species of *Bungalotis* in that the costa of the secondaries of the males is not shot with blue from the side light thus placing it in the *borax* Evans (1952) complex, but the markings and palpi do not fit other members of that group and the genitalia are distinct even though there are some similarities to *astylos* (Cramer) which has the blue shot on the costa of the secondaries and the cheeks are distinctly white at the base in both sexes.

#### ACKNOWLEDGMENTS

The author wishes to thank the National Geographic Society for furnishing research grants which made it possible for this research to be conducted during the past four summers. I would also like to thank Dr. Frederick H. Rindge, Curator, Department of Entomology, the American Museum of Natural History, E. C. Welling and Dr. W. W. McGuire for the loan of specimens for determination. The photographs of the adults used in this article were made by Melvin Cannon, ICT Coordinator, Hillcrest High School, Dallas, Texas.

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ABERRANT *ERYNNIS TRITUS TATIUS* (HESPERIIDAE)

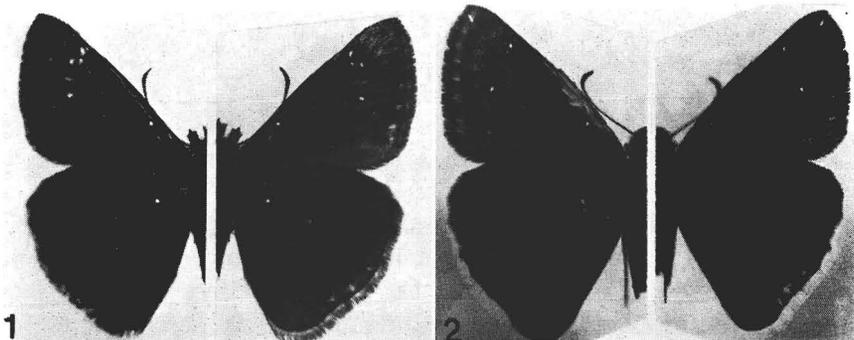
Although they occur with some frequency in many genera, aberrant specimens appear uncommon in the North American Pyrginae. Burns, in his monograph *Evolution in Skipper Butterflies of the Genus Erynnis* (Univ. of Calif. Publ. in Entomol., Vol. 37, Berkeley, 1964) made no mention of such in this genus.

In July 1976 while I was collecting in Grant Co., New Mexico, I took an unusual *Erynnis* specimen which I thought at first was a male *horatius* (Scudder & Burgess). Upon genitalic examination, it was determined to be an aberrant *E. tristus tatus* (Edwards), a fairly common species in this region. The specimen was collected along the Gila River at Riverside, 4250' (1295 m), Grant Co., New Mexico on 4 July 76.

Fig. 1 shows the dorsal and ventral views of the aberrant specimen while Fig. 2 illustrates a typical *tatus* taken on the H-Y Ranch, Mule Creek area, Grant Co., N.M., on 10 August 75. In the aberrant specimen, the ventral HW white spots are reduced in size and replaced by pale brown with a central light dot. The wing fringes are brown rather than white. The forewings resemble normal *tatus*. A similar aberrant female was taken S of Silver City, Grant Co., N.M. on 26 August 76.

While I have collected many hundreds of *Erynnis*, including some unusually small and large examples, this is the first aberration that I have encountered.

CLIFFORD D. FERRIS, *Bioengineering Program, University of Wyoming, Laramie, Wyoming 82071.*



Figs. 1-2. *Erynnis tristus tatus*. 1, aberrant, dorsal left, ventral right; 2, normal, dorsal left, ventral right.