

A NEW SPECIES OF *AMBLYSCHIRTES* FROM MONTANE WESTERN MEXICO (LEPIDOPTERA: HESPERIIDAE: HESPERIINAE)

ANDREW D. WARREN

Dept. of Entomology, Oregon State University, Corvallis, Oregon 97331-2907, USA

ABSTRACT.— *Amblyscirtes novimmaculatus* n. sp. is described from thirteen males from mountainous parts of Nayarit, Jalisco, Michoacán, Guerrero, and Oaxaca states, Mexico. This new species is most similar to *A. anubis*, and has only been found between 1400 and 1800 m. elevation, at the peak of the local rainy season. This species is compared to *A. anubis*, *A. patriciae*, and *A. raphaeli*, and male genitalia of *A. anubis* and *A. raphaeli* are illustrated and compared to that of *A. novimmaculatus*.

RESUMEN.— Se describe *Amblyscirtes novimmaculatus* sp. n. a partir de 13 machos provenientes de localidades montañosas en los estados Mexicanos de Nayarit, Jalisco, Michoacán, Guerrero y Oaxaca. Esta especie nueva solo se encuentra entre 1400 y 1800 msnm, y vuela durante la época de lluvias más intensivas en la región. Se discute sobre la diferenciación de la especie nueva, *A. anubis*, *A. patriciae* y *A. raphaeli*, y se comparan y presentan ilustraciones de los genitales masculinos de *A. anubis*, *A. raphaeli*, y la especie nueva.

KEY WORDS: *Amblyscirtes novimmaculatus* n. sp., biogeography, Central America, Colima, Guatemala, Ithomiinae, Mesoamerica, *Moeris*, Morelos, Neotropical, Puebla, Satyrinae, taxonomy.

When it became apparent that *Amblyscirtes immaculatus* Freeman (1970) is a synonym of *A. patriciae* (Bell, 1959), I sent a draft of a manuscript demonstrating its synonymy (Warren, 1996) to Hugh Avery Freeman (Garland, TX) for comments. Freeman agreed with my treatment of *A. immaculatus* as a synonym of *A. patriciae*; after all, when Freeman described *A. immaculatus* (1970), *A. patriciae* was placed in *Moeris*, and was known only from the single holotype male from Guatemala (*Amblyscirtes patriciae* wasn't recognized as an *Amblyscirtes* until Burns (1990) brought it into the genus). When Freeman responded with comments on my manuscript, he mentioned that he had two male *Amblyscirtes* in his collection that he had been calling *A. patriciae*, yet which clearly did not match the type of *A. patriciae*, as illustrated in the manuscript, or Mexican "*immaculatus*" specimens. Freeman forwarded one of the two specimens to me early in 1996, when genitalic study revealed that it was an undescribed species.

While doing fieldwork in Michoacán and Nayarit in 1996, two additional males of this undescribed *Amblyscirtes* were collected. One male was collected in Michoacán at 1460m elevation on July 26th, and one male was taken in Nayarit at 1600m elevation on September 27th. Both specimens were first noticed while perching on the tips of small branches, about one meter off the ground. The specimen from Michoacán was perching at the edge of undisturbed mixed pine-oak cloud forest, along a small, very shady trail at P. H. Zumpimito. The Nayarit specimen was taken in a clearing in a narrow gully, about three meters wide, also in pine-oak cloud forest, at Rancho la Noria, at the top of the Sierra San Juan, near Tepic.

While examining papered Mexican skipper specimens at the Museo de Zoología (MZFC), Universidad Nacional Autónoma de México, in Mexico City, several skipper specimens from Jalisco that were collected too late to be included in the Jalisco state list (Vargas et al., 1996) were examined, which included two additional males of this new species, collected at 1400m in late September, 1994 by Armando Luis-Martínez of the MZFC. These two specimens were collected along the edge of the road leading to the Los Mazos microwave tower, above Puerto Los Mazos on Hwy. 80, SW of Autlán (Fig. 1). One of these specimens (Fig. 2-3) was chosen as the holotype for this new species.



Fig. 1. Road leading to Los Mazos microwave tower at about 1400m, above Puerto Los Mazos, on Hwy. 80, SW of Autlán, Jalisco, Mexico (Sierra de Manantlán).

Among papered specimens from Guerrero in the MZFC collected while conducting field studies on the Papilionoidea of the state (Vargas et al., 1994), 7 additional males of this species were found, from Municipios Tetipac, Atoyac de Alvarez, and Chilpancingo de Los Bravo. The female remains unknown.

Amblyscirtes novimmaculatus A. D. Warren, new sp.

Diagnosis.— This species is likely to be confused only with *A. patriciae* and *A. anubis* (Godman, 1900). *Amblyscirtes patriciae* differs from *A. novimmaculatus* in its larger size, in its complete, well developed forewing stigma on males, in its more developed dorsal and ventral forewing maculation, and in its checkered or white fore- and hindwing fringes (see Warren, 1996: Figs. 6-7). *Amblyscirtes anubis* differs from *A. novimmaculatus* in its slightly smaller size (on average), in its more poorly developed forewing stigma, without microandroconia (Fig. 4), in its more developed ventral hindwing white spotting (Fig. 5), and in its tendency to have a yellow forewing fringe (a variable trait). When specimens are not in fresh condition, however, most

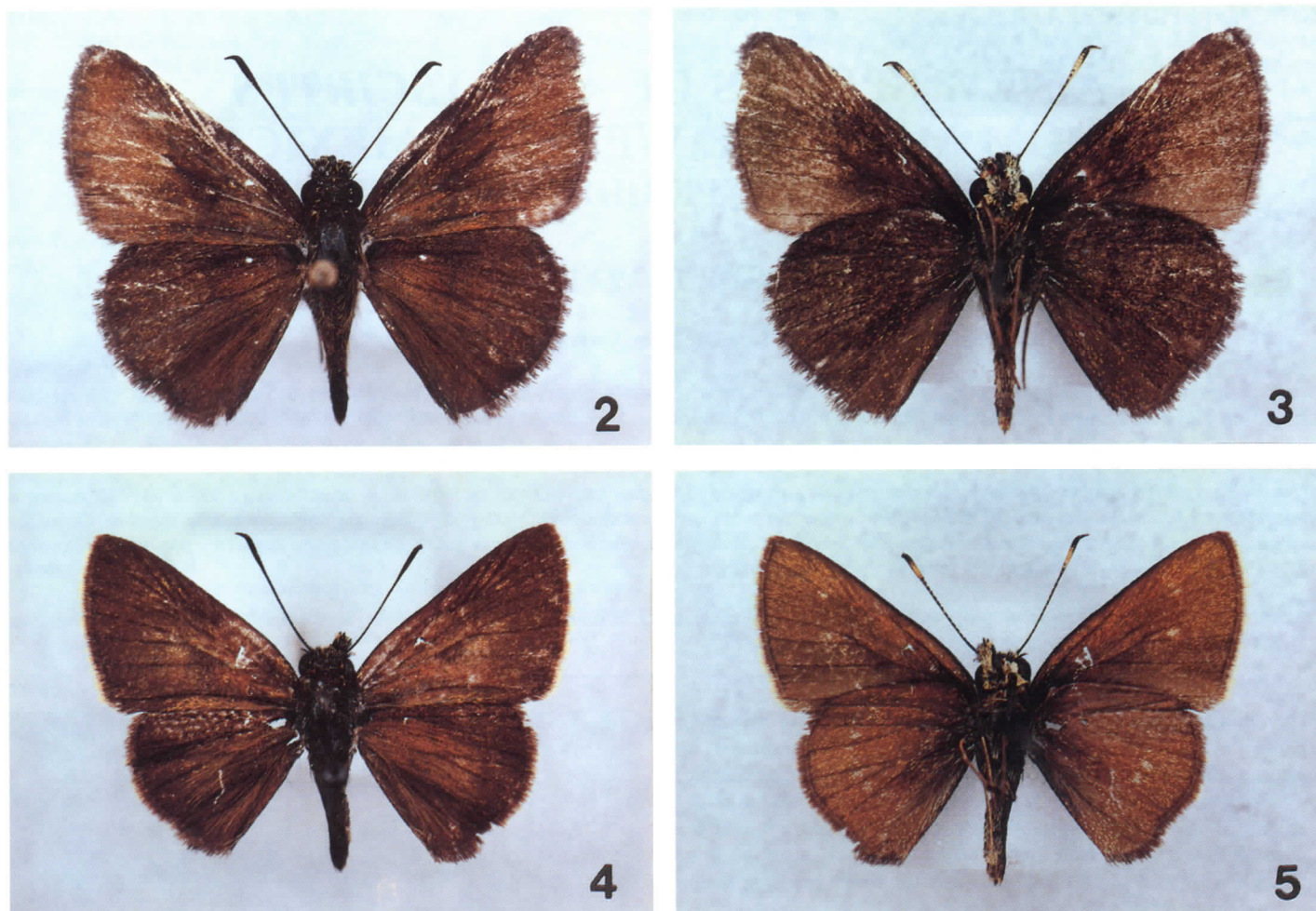


Fig. 2-5. Adult males of *Amblyscirtes novimmaculatus* and *A. anubis*. 2) Dorsal and 3) ventral surfaces of *A. novimmaculatus* holotype male, from Micro. los Mazos, 10 km S Puerto Los Mazos, SW Autlán on Hwy. 80, 1400m, Jalisco, Mexico, 25 Sep 1994, A. Luis-M. (MZFC). Right forewing length (from base to apex) = 15.4mm. 4) Dorsal and 5) ventral surfaces of *A. anubis* from Omiltemi, 2200m, Guerrero, Mexico, 12 Jun 1984 (A. D. Warren genitalia vial # 96-87). Right forewing length (from base to apex) = 14.2mm.

characters that separate *novimmaculatus* from *A. anubis* cannot be observed without genitalic examination. Dorsal view of the tegumen, uncus and gnathos will readily separate *A. novimmaculatus* (Fig. 6A) from *A. anubis* (Fig. 7A), which has very broad arms of the gnathos, which extend beyond the distal tip of the uncus, and a very narrow tegumen.

Description.—MALE. Average forewing length (from base to apex): 14.7mm (holotype 15.4mm, 4 paratypes measured: 15.3, 13.2, 14.7, and 14.8mm, in order listed under "Types"). **Wings upperside:** Ground color dark chocolate brown throughout on fore- and hindwings. Basal third of fore- and hindwings with very sparse ochraceous overscaling, absent in worn specimens. Forewing stigma fairly well developed, with tan microandroconia covered with dark brown scales, in two separate parts: largest section under Cu1, from junction with Cu2 almost to junction of M3-Cu1. Smaller section about half the length of larger section, centered under Cu2, originating below junction of Cu1-Cu2. Fore- and hindwing fringes as ground color, not checkered. **Wings underside:** Fore- and hindwing ground color dark chocolate brown, slightly darker than dorsal surface. Forewing lighter, approaching tan in some individuals, in submargin in Cu1-Cu2, and along tornus below Cu2. Trace of yellowish spots on forewing between R4-R5 and M2-M3 present in fresh specimens only. Outline of dorsal forewing stigma present as very dark, blackish scales. Entire surface of hindwing, and on forewing near apex, along outer margin not reaching tornus, and along costa to base, with sparse ochraceous overscaling. Trace of whitish spots on hindwing between M3-Cu1, Cu1-Cu2, and Cu2-2A in fresh individuals only. Fore- and hindwing fringe as ground color, not checkered. **Antennae:** with nudum of 11 segments in all specimens examined. Dorsally, antennae constant dark brown; ventrally, antennal club

at base, and apiculus along outer lateral edge yellow, shaft lightly checkered with yellow at base of each segment. **Body:** dorsally, head, palpi, tegulae, thorax, and abdomen covered in scattered long and short brown, yellow, and orange scales. First and second palpal segments clothed in dense, long, orange, yellow, and brown scales, lightest on ventral first segment, with some scattered whitish scales. Third segment long and porrect, tightly clothed with short, flat brown scales. Narrow ring of white scales along ventral margin of eyes. Ventral thorax and abdomen clothed in scattered long, gray, yellow, orange, and brown scales. Prothoracic tibiae with shiny gold epiphysis, covered with long, brown scales. Mesothoracic tibiae with one pair of distal spurs, metathoracic tibiae with two pairs. Dorsally, all legs covered in short brown scales, ventrally, all femora with long, yellow, gray, and brown scales, all tibiae and tarsomeres with short, tan scales ventrally. **Genitalia:** Saccus very long (Fig. 6E). Tegumen quite broad, with two hollowed areas adjacent to the base of a dorso-caudal projection, or "fin." Uncus very short, bent downward, with two short, rounded lobes at distal base; gnathos bifurcate, narrow arms barely visible in dorsal view (Fig. 6A). Valvae symmetrical, long, with nearly straight dorsal margin. Ampulla slightly overlaps harpe (in outer lateral view), which projects dorsally well above dorsal margin of valvae. Harpe with poorly developed inward pointing process near distal tip (Fig. 6B, E). Aedeagus long and smooth, except at symmetrical distal tip (Fig. 6E): dorsal edge laterally bifurcate, forming a narrow dorsal opening, and a row of 6-7 short spines on each side (Fig. 6C). Dorso-lateral bifurcations at distal tip of aedeagus swollen dorsally (Fig. 6E). Juxta well developed (Fig. 6D).

FEMALE: unknown.

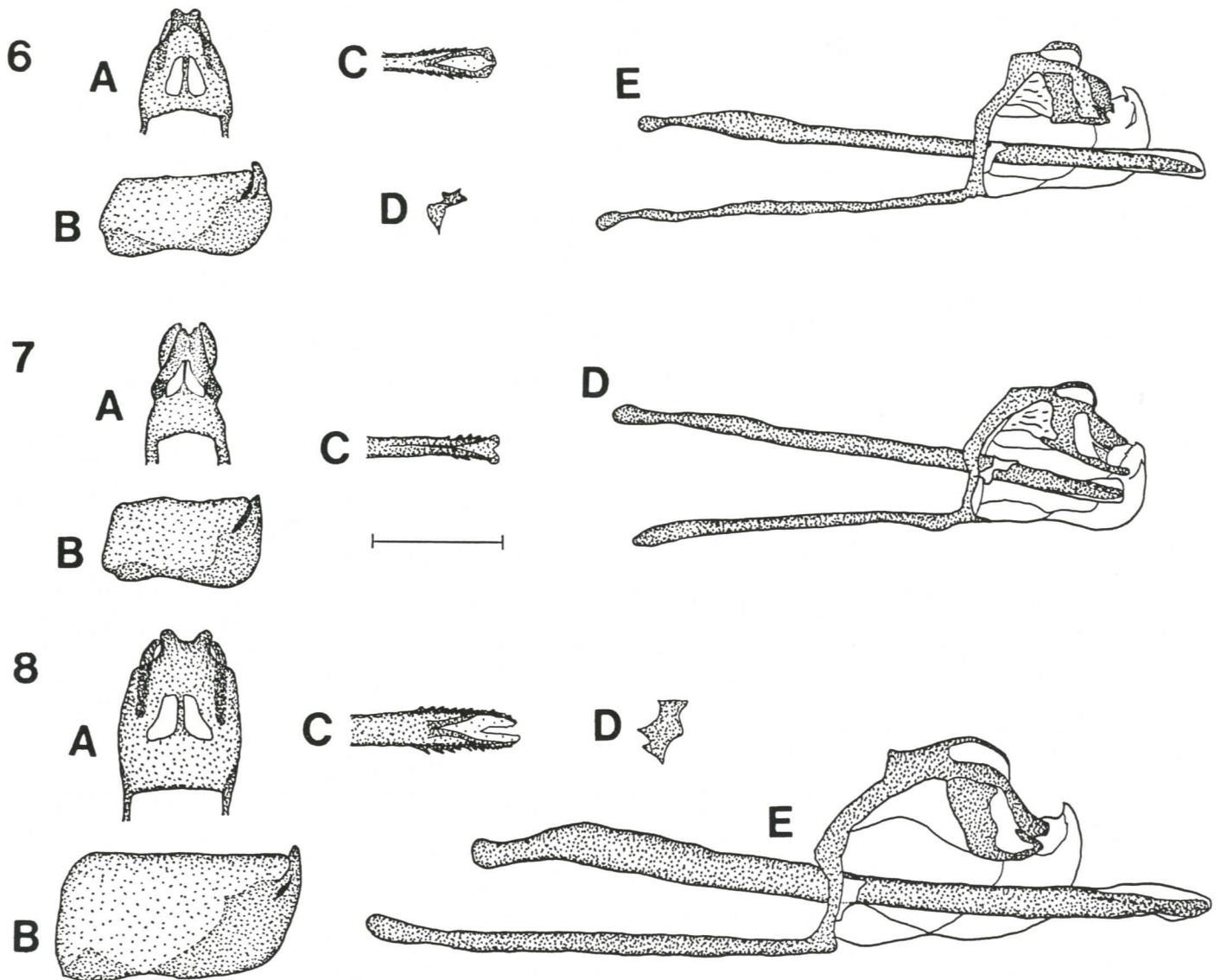


Fig. 6. Male genitalia of *Amblyscirtes novimaculatus* paratype from near Yosuyusi, Tripui region, Oaxaca, Mexico, 22 Jul 1992, J. Kemner (CMNH) (H. A. Freeman genitalia vial # H-1700). A) Dorsal view of tegumen, uncus, and gnathos, B) lateral view of left valve, C) dorsal view of distal tip of aedeagus, D) left lateral view of juxta, E) left lateral view of complete genitalia, minus left valve. Scale = 1.0mm.

Fig. 7. Male genitalia of *Amblyscirtes anubis*, data as in Fig. 4-5. A) Dorsal view of tegumen, uncus, and gnathos, B) lateral view of left valve, C) dorsal view of distal tip of aedeagus, D) left lateral view of complete genitalia, minus left valve, showing complete juxta. Scale = 1.0mm.

Fig. 8. Male genitalia of *Amblyscirtes raphaels* from Platanarillos, NW of Cd. Colima on Rd. to Minatitlán, 900m, 29 Sep 1994, I. Vargas-F. (A. D. Warren genitalia vial # 96-62). A) Dorsal view of tegumen, uncus, and gnathos, B) lateral view of left valve, C) dorsal view of distal tip of aedeagus, D) left lateral view of juxta, E) left lateral view of complete genitalia, minus left valve. Scale = 1.0mm.

Types.— *Holotype* ♂ (Fig. 2-3): with the following labels: white (printed) MEXICO: Jalisco: Micro. los Mazos, 10 km S Puerto Los Mazos, SW Autlán on Hwy. 80, 1400m, 25 Sep 1994, A. Luis-Martínez/ red (printed and handwritten) HOLOTYPE *Amblyscirtes novimaculatus* A. D. Warren.

Paratypes (12 ♂, all from Mexico): same locality as holotype, 26 Sep 1995, A. Luis-Martínez (1 ♂). *Nayarit*: Mpio. Tepic: Rancho La Noria, 1600m, 27 Sep 1996, A. D. Warren (1 ♂). *Michoacán*: Mpio. Uruapan: P. H. Zumpimito, 1460m, 26 Jul 1996, A. D. Warren (1 ♂). *Guerrero*: Mpio. Atoyac de Alvarez: Los Retrocecos, 1580-1650m, 31 Aug 1983, A. Luis-M. (1 ♂); Mpio. Chilpancingo de Los Bravo: Cueva del Borrego, Omilteme, 1800m, 6 Jul 1985, I. Vargas-F. (1 ♂); Mpio. Tetipac: Arroyo Las Damas, 1800m, 8 Jun 1986, A. Luis-M. (1 male); same locality and collector, 22 Jul 1986 (1 ♂); same locality, 22 Aug 1986, M. Mendez-M. (1 ♂); same locality and collector, 23 Aug 1986 (2 ♂). *Oaxaca*: Tripui region, near Yosuyusi, 22 Jul 1992, J. Kemner (2 ♂).

Deposition of types.— The holotype and five paratypes will be placed in the Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autónoma de México, Mexico City (MZFC). Two paratypes from the H. A. Freeman collection (Garland, TX) will be placed in the Carnegie Museum of Natural History, Pittsburgh, PA (CMNH). Paratypes will be placed in The Natural History Museum, London, England (BMNH), American Museum of Natural History, New York, NY (AMNH), United States National Museum of Natural History, Washington, D.C. (USNM), and the collection of the author.

Type Locality.— The type locality, around the Los Mazos microwave tower SW of Autlán, Jalisco (Fig. 1), is composed of dense, mixed broadleaf cloud forest, with scattered pines. This forest type is isolated on the top of the Sierra de Manantlán, from about 1300-1600m or higher. Below this zone, the Sierra is covered in a much drier oak forest, becoming mixed with tropical semi-deciduous forest and thorn forest below 1000m. The isolated forest on top of the Sierra de Manantlán around the microwave tower is the only

known habitat in Jalisco for many butterfly species, including the satyrids *Dioriste tauropolis* (Westwood) and an undescribed species of *Pedaliodes*. The shaded gully at Rancho la Noria, in the Sierra de San Juan, Nayarit, where one papatype was taken was also inhabited by four species of clear-winged ithomiines, *Pteronymia rufocincta* (Salvin), *Greta morgane morgane* (Geyer), *Greta annette moschion* (Godman), and *Episcada salvinia portilla* J. de la Maza & Lamas.

Distribution.—The known specimens of *A. novimaculatus* reflect a large geographic range in montane western Mexico, from Nayarit in the north to at least Oaxaca in the south. While nothing is known about the elevation or habitat type where the two Oaxaca specimens were collected, specimens from Guerrero, Michoacán, Jalisco, and Nayarit were all taken between 1400–1800m elevation, in densely forested areas, at the peak of the local rainy season. This species should eventually be found in Colima.

This is one of many species of butterflies endemic to mountainous areas of western Mexico, as detailed by Llorente and Escalante (1992), Warren (1995), and Warren and González (1996).

Etymology.—This new species is the most immaculate *Amblyscirtes* known (if colored wing fringes and palpi are considered in addition to wing markings), being even more immaculate than *A. immaculatus*, which was recently synonymized with *A. patriciae* (see introduction).

Remarks.—*Amblyscirtes novimaculatus* is apparently more closely related to *A. anubis* than any other species. The larger *Amblyscirtes* species of western Mexico, including *A. patriciae* (Warren, 1996: Fig. 8-9), and *A. raphaeli* Freeman, 1973 (Fig. 8A-E) all have much greater wing lengths, and larger genitalia, with much more complex distal ends of the aedeagi. The distal end of the aedeagus of *A. novimaculatus* is not much more complex than *A. anubis*, both of which are hollowed dorsally, when compared to *A. patriciae* (Warren, 1996: Fig. 9A, D) and *A. raphaeli* (Fig. 8C, E), which have bifurcate distal tips of the aedeagi. The overall size of the genitalia of *A. novimaculatus* and *A. anubis* are very similar, despite the fact that *A. novimaculatus* adults are usually larger than *A. anubis*. Additionally, *A. patriciae* and *A. raphaeli* have very well developed forewing stigmata, much better developed than on *A. novimaculatus* and *A. anubis*; the stigmata of *A. patriciae* and *A. raphaeli* extend to the lower portion of cell Cu2-2A, *A. novimaculatus* and *A. anubis* only have traces of stigma in the upper part of Cu2-2A along Cu2.

Amblyscirtes anubis and *A. novimaculatus* are mountain species, *A. novimaculatus* having been found (to date) only between 1400 and 1800m, while *A. anubis* is typically found around 1800–2200m in Guerrero, where both species fly together at least at Omilteme. *Amblyscirtes patriciae* occurs at 918m in Michoacán, and together with *A. raphaeli* in Colima at Platanarillos at 900m (not 350m as stated in Warren, 1996), and at La Calera at only 400m. All *Amblyscirtes* in western Mexico fly primarily during the rainy season (June–October).

With the discovery of this new species, 19 species (and three described subspecies) of *Amblyscirtes* have been confirmed from Mexico (Warren, 1998). This number does not include *A. texanae* Bell, 1927, which almost certainly occurs in northern Mexico, but has yet to be confirmed.

ACKNOWLEDGMENTS

I thank Hugh Avery Freeman (Garland, TX) for sending me the first *A. novimaculatus* specimen examined. I also thank Armando Luis-Martínez (MZFC) for collecting several types, and for his hospitality during the March, 1997 visit when the Guerrero material was examined, and Isabel Vargas-Fernández (MZFC) for collecting a paratype, presenting me with the Jalisco material, and for her hospitality during the July, 1996 visit to Mexico City when the Jalisco material was examined. Without the help of Jorge Llorente-Bousquets (MZFC) in planning fieldwork and obtaining Mexican collecting permits, this research would not have been possible. Rosa Estella González (University of Nayarit, Tepic) provided transportation on the September, 1996 trip when one paratype was collected. Thanks also to Lamberto González-Cota (C.E.F.E.S.O.M.A.C., Uruapan, Michoacán), for his hospitality on the

July, 1996 trip when one paratype was collected. Quentin D. Wheeler (Cornell University, Ithaca, NY) kindly provided the use of a camera lucida for preparation of the genitalia drawings presented in this paper. This research was supported in part by DGAPA-UNAM, DGAPA IN-200394, and CONABIO in Mexico City.

REFERENCES

- Bell, E. L.
1927. Description of a new *Amblyscirtes* from Texas (Lepidoptera, Rhopalocera, Hesperidae). *Bull. Brooklyn Ent. Soc.* (New York), 22:203–204.
1959. Descriptions of some new species of Neotropical Hesperidae (Lepidoptera, Rhopalocera). *Amer. Mus. Novit.* (New York), 1962:1–16.
- Burns, J. M.
1990. *Amblyscirtes*: Problems with species, species groups, the limits of the genus, and genus groups beyond. A look at what is wrong with the skipper classification of Evans (Hesperidae). *J. Lepid. Soc.* (Los Angeles), 44:11–27.
- Freeman, H. A.
1970. A new genus and eight new species of Mexican Hesperidae (Lepidoptera). *J. New York Ent. Soc.*, 78:88–99.
1973. A review of the *Amblyscirtes* with the description of a new species from Mexico (Hesperidae). *J. Lepid. Soc.* (Los Angeles), 27:40–57.
- Godman, F. D.
1879–1901. In F. D. Godman and O. Salvin (eds.), *Biologia Centrali Americana. Zoology: Insecta. Lepidoptera-Rhopalocera*, 3:49–112 [part]. London: Taylor & Francis.
- Llorente-B., J., and P. P. Escalante
1992. Insular biogeography of submontane humid forests in Mexico. In S. P. Darwin and A. L. Welden (eds.), *Biogeography of Mesoamerica*, 139–146. New Orleans: Tulane Univ. Pr.
- Vargas-F., I., J. Llorente-B., and A. Luis-M.
1994. Listado Lepidopterofaunístico de la Sierra de Atoyac de Alvarez en el estado de Guerrero: notas acerca de su distribución local y estacional (Rhopalocera: Papilionoidea). *Folia Entomol. Mex.* (Mexico City), 86:41–178.
- Vargas-F., I., A. Luis-M., J. Llorente-B., and A. D. Warren
1996. Butterflies of the state of Jalisco, Mexico. *J. Lepid. Soc.* (Los Angeles), 50:97–138.
- Warren, A. D.
1995. A new species of *Codatractus* from western Mexico (Lepidoptera: Hesperidae). *Trop. Lepid.* (Gainesville), 6:21–25.
1996. *Amblyscirtes patriciae*: description of the female and notes on its synonymy, behavior, habitat and distribution in Mexico (Lepidoptera: Hesperidae: Hesperinae). *Trop. Lepid.* (Gainesville), 7:127–132.
1998. Hesperioidea (Lepidoptera). In J. Llorente-B., A. García-N., E. González-S., and N. Papavero (eds.), *Biodiversidad, Taxonomía y Biogeografía de Artrópodos de México: Hacia una Síntesis de su Conocimiento, (Volumen II)*, [in press]. Mexico City: Instituto de Biología, UNAM & CONABIO.
- Warren, A. D. and L. González-C.
1996. Rediscovery of *Dalla bubobon* in Michoacán, Mexico (Lepidoptera: Hesperidae: Heteropterinae). *Trop. Lepid.* (Gainesville), 7:68–70.