

AMBLYSCIRTES PATRICIAE: DESCRIPTION OF THE FEMALE AND NOTES ON ITS SYNONYMY, BEHAVIOR, HABITAT AND DISTRIBUTION IN MEXICO (LEPIDOPTERA: HESPERIIDAE: HESPERIINAE)

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ABSTRACT.— A careful examination of recently collected *Amblyscirtes immaculatus* Freeman specimens from western Mexico, coupled with an examination of the type specimen of *Amblyscirtes patriciae* (Bell) (especially its genitalic characters), from Guatemala, revealed that *patriciae* and *immaculatus* are undoubtedly the same species. *Amblyscirtes immaculatus*, therefore, becomes a new synonym of *Amblyscirtes patriciae*. The female of *A. patriciae* is described for the first time, from a single specimen from Michoacán, Mexico. Notes on the habitat, perching behavior, and distribution of *A. patriciae* in western Mexico are presented. The male genitalia of *A. patriciae* are compared to the genitalia of other similar, large *Amblyscirtes* from western Mexico: *A. folia* Godman and *A. raphaeli* Freeman.

RESUMEN.— Un examen de ejemplares recién recolectados de *Amblyscirtes immaculatus* Freeman, con la comparación del tipo de *Amblyscirtes patriciae* (Bell), especialmente sus genitales, revelaron que *A. patriciae* e *A. immaculatus* son la misma especie. Por consiguiente *Amblyscirtes immaculatus* es un sinónimo nuevo de *Amblyscirtes patriciae*. Se describe la hembra de *A. patriciae* por primera vez, a partir de un solo ejemplar de Michoacán, México. Se presentan notas sobre el habitat, la conducta de percha, y la distribución de *A. patriciae* del occidente de México. Se comparan los genitales masculinos de *A. patriciae* con los genitales de especies similares de *Amblyscirtes* de tamaño grande del occidente de México, *A. folia* Godman y *A. raphaeli* Freeman.

KEYWORDS: biogeography, Central America, Chiapas, *Codatractus*, Colima, El Salvador, Guatemala, Guerrero, Jalisco, Mesoamerica, Morelos, Neotropical, Oaxaca, *Phanus*, "*Poanes*," Puebla, taxonomy.

While studying genera closely related to *Amblyscirtes*, Burns (1990) examined the type of *Moeris patriciae* Bell (1959) and recognized it as an *Amblyscirtes*, closely related to the large, dark *Amblyscirtes* species of Mexico: *A. folia* Godman (1900), *A. raphaeli* Freeman (1973), and *A. immaculatus* Freeman (1970). In preparing an earlier version of this paper describing the female of *A. immaculatus*, it became apparent after examining the genitalia of the type of *A. patriciae* that *A. immaculatus* is actually a synonym of *A. patriciae*. Before demonstrating the synonymy of *A. immaculatus* and describing the female of *A. patriciae*, a summary of all information known about the two "species" is presented.

Ernest Bell (1959) described *Moeris patriciae* from a single specimen (Fig. 1-2), collected at "Salama," [actually Salamá, Dept. Baja Verapaz] Guatemala, 3000 ft [1417m], on 22 July 1947, by Patricia Vaurie. To date, no other specimens of *A. patriciae* have been reported.

Amblyscirtes immaculatus was described by Hugh Avery Freeman (1970) from four males collected in western Mexico. Three of them, including the holotype, are from La Salada, Colima, collected in June (4, 10, and 19) 1967 by Robert Wind. The fourth specimen is from Acahuizotla, Guerrero, collected in July 1960, by Tarsicio Escalante. Freeman's (1973) review of the genus *Amblyscirtes* made no mention of additional material having been discovered, and no report of the undescribed female.

There is one additional specimen, not mentioned by Freeman, in the United States National Museum (USNM), Smithsonian Institution, Washington, DC, from Iguala, Guerrero, 2400 ft [1134m], collected by Schaus in June 1906. As with *A. patriciae*, since its original description, no additional information on *A. immaculatus* has been reported in the literature.

In June 1994, while doing fieldwork with Armando Luis-Martínez and Isabel Vargas-Fernández (of the Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autónoma de México) in Jalisco and Colima, we initially determined the skippers found at Platanarillos, Colima, to be *Amblyscirtes immaculatus*. At Platanarillos (Fig. 3), this large, dark *Amblyscirtes* was found along a streamside at 350m elevation. On 11-12 June, a total of 8 males were observed and collected. Dorsal and ventral views of one of the males are shown in Fig. 6-7.

Of the eight individuals observed, six were first seen when they were scared up from their perches by our approach. All perching skippers were observed on one of three separate perches, the tips of short plants that were 0.75m, 1.0m, and 1.25m tall. All three perches were within 50m of each other, and all the perches were on the bank of the small creek shown in Fig. 3. When the skippers were startled, they would rapidly circle the area within about a 10m radius of their original perch a few times, and then return to the same, or a very nearby perching site on the same plant. Once this behavior had been identified, and was being

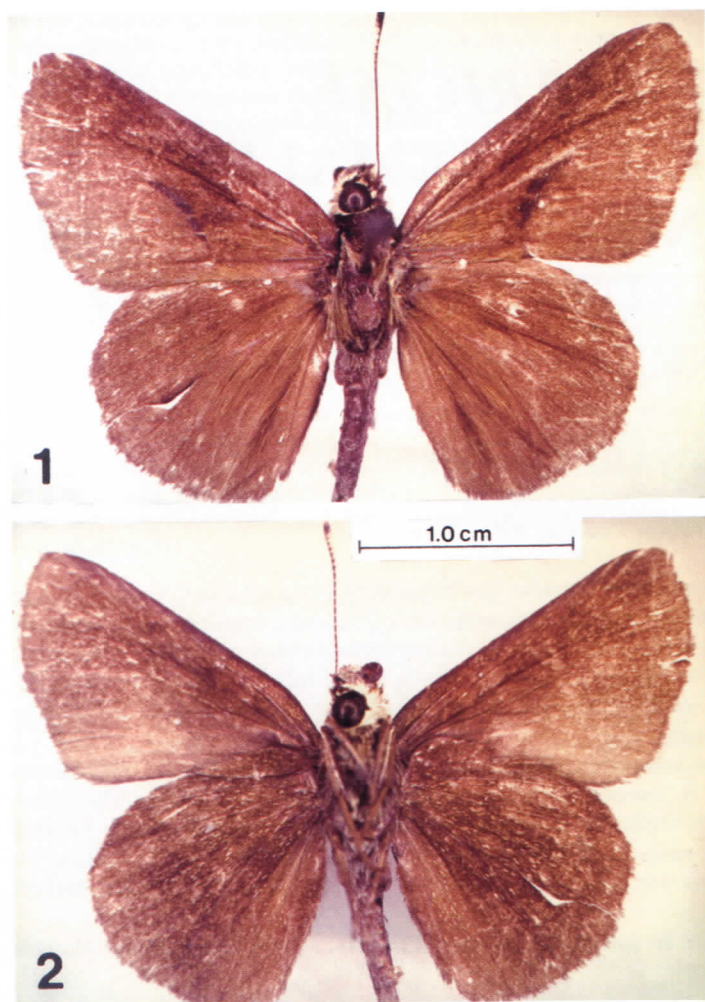


Fig. 1-2. 1) *Amblyscirtes patriciae*, holotype male, dorsal surface; 2) ventral surface, from Salamá, Guatemala, 3000', 22 Jul 1947, Patricia Vaurie (AMNH).

watched for, skippers could be spotted on their perches before they were scared up. When a large *Amblyscirtes* was collected from its perch, another individual of the same species would usually occupy the same perch within about fifteen minutes. Weather conditions on 11-12 June were partly to mostly cloudy with intermittent rain. All perching behavior was observed in mostly cloudy to partly cloudy weather.

The perching behavior of the males encountered is typical of other species of *Amblyscirtes* that perch in gullies or streambanks (especially *A. aenus* Edwards (1878), *A. oslari* Skinner (1899), *A. tolteca* Scudder (1872), and *A. phylace* (Edwards, 1878), as described by Stanford (1981), except that these large *Amblyscirtes* were perching on plants, while other, smaller *Amblyscirtes* species normally perch on the ground or on stones.

At Platanarillos, *Amblyscirtes tolteca* was very common. *A. tolteca* males were perching as noted above, on stones directly below the perches of *A. immaculatus*. When one of the species took to flight, in six separate instances, chases were observed that lasted up to one minute. When the two male skippers were chasing each other away from their perches, they would fly together up to great heights, often out of sight, and then both would usually return to their original perches. It would often take two or three tries before both skippers could settle again at their



Fig. 3. The stream and adjacent habitat where *Amblyscirtes patriciae* was found at Platanarillos, Colima, Mexico.

original perches without a new chase occurring. Neither *A. immaculatus* or *A. tolteca* seemed nearly as interested in chasing other species of slower-flying skippers that flew by their perches. All eight individuals observed at Platanarillos in June were in excellent condition, and had apparently just emerged. Subsequent fieldwork by Isabel Vargas at Platanarillos on 28-29 September 1994, resulted in the collection of 3 additional, very worn male "*immaculatus*," as well as one male *A. raphaeli*, a species which had not previously been reported from Colima.

In May 1995, while going through skipper specimens collected by Lamberto González-Cota, in Michoacán, Mexico (between October 1989, and March 1995), 17 additional specimens initially determined as *A. immaculatus* were found, including one female. González-Cota found the large *Amblyscirtes* at only one locality: Planta Hidroeléctrica Cupatitzio (Municipio Gabriel Zamora), which is on the small Rio Cupatitzio, at 918m elevation in west-central Michoacán, south of Uruapan. The single female was collected on 22 Jun 1991. The 16 males were collected on 4 Aug 1994 [1], 7 Aug 1994 [1], 18 Aug 1991 [1], 21 Aug 1994 [3], 23 Aug 1994 [5], 30 Aug 1994 [3], and 8 Sep 1994 [2]).

All of the specimens collected by González-Cota, except for two (the female and one male), were worn individuals in poor



Fig. 4-7. 4) *Amblyscirtes patriciae*, female, dorsal surface; 5) ventral surface, from Planta Hidroeléctrica Cupatitzio, Gabriel Zamora, Michoacán, Mexico, 22 Jun 1991, Lamberto González-Cota (MZFC); 6) *A. patriciae*, male, dorsal surface; 7) ventral surface, from Platanarillos, Colima, Mexico, 12 Jun 1994, Andrew D. Warren (ADW).

condition, most having large tears in their wings, and smudged wing surfaces. Almost all of the Michoacán specimens were missing any trace of checkered wing fringes, had greatly reduced gray overscaling on the ventral hindwing, and reduced fulvous scaling on the dorsal surface of both wings, with the white apical spots at the apex of the forewings completely missing (only 6 of the 17 Michoacán specimens showed any trace of forewing apical spots). All of these characteristics are obvious on fresh specimens in Fig. 4-7.

The type of *A. patriciae* (Fig. 1-2) was examined and compared to the fresh Colima and worn Michoacán specimens. The type is a worn, faded specimen. As the original description notes, however, there is some fulvous overscaling on the upper surfaces of all four wings. There is also scattered gray overscaling on the ventral surface of the hindwings, although most of it has apparently been worn off. As with most of the Michoacán specimens, there is no trace of white apical spots on the forewings of the type of *A. patriciae*. Although almost the entire wing fringe is missing on the holotype of *A. patriciae*, there are a few whitish fringe scales remaining along cell CuA2-2A on the left forewing, and along cell CuA1-CuA2 on the right forewing. Despite these

few remaining light scales, Bell stated that the fringes "are very worn but appear to be brown, with some whitish hairs intermixed at and above the inner angle." As noted by Burns (1990), most of the apiculus of the antennal club is missing on the single antenna remaining on the type of *A. patriciae*. Otherwise, the antennae of *A. patriciae* and *A. immaculatus* are identical. The forewing stigma of *A. patriciae* is consistent with the stigmas on all "*immaculatus*" specimens examined from Mexico.

Bell prepared the genitalia of the type of *A. patriciae* on a glass slide. In the process of mounting the genitalia, the tegumen and the juxta were badly smashed, so that they cannot be compared to other specimens from Mexico. However, the valvae, uncus, gnathos, and the aedeagus can be readily examined. In every genitalic character observable, the genitalia of the type of *A. patriciae* are an exact match to the genitalia of the fresh Colima specimen in Fig. 9. The overwhelming similarity of the genitalia leave little doubt that *A. immaculatus* is indeed a synonym of *patriciae*. A complete discussion of the genitalia of *A. patriciae*, with comparisons to *A. folia* and *A. raphaeli*, is provided below under Remarks.

The only observed morphological difference between the type

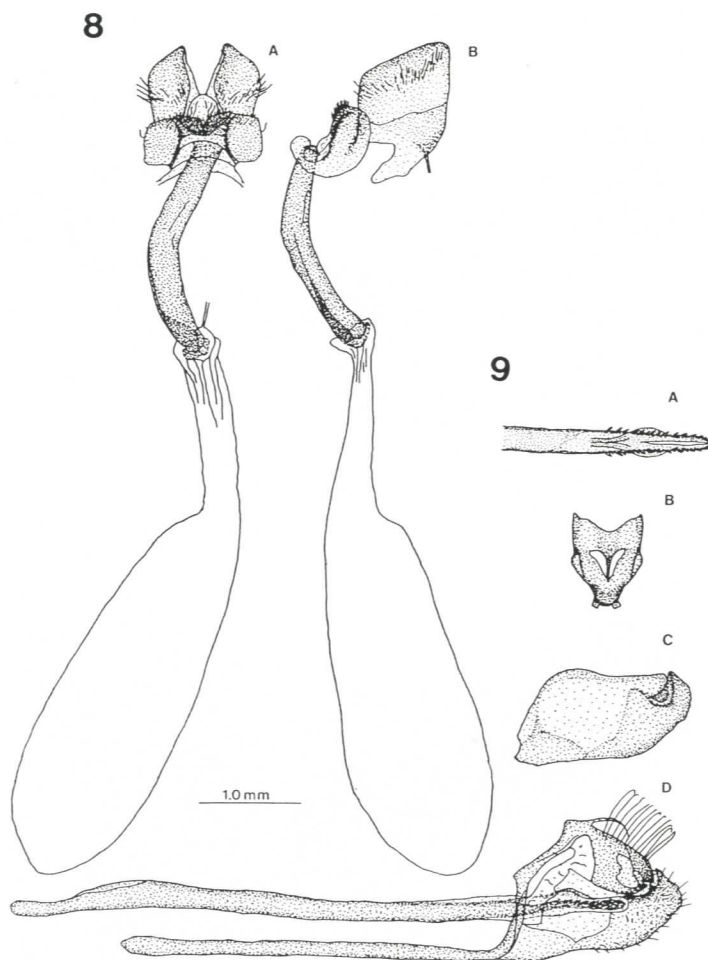


Fig. 8-9. 8) Female genitalia of *Amblyscirtes patriciae*, same data as Fig. 4-5, Andrew D. Warren genitalia vial # 95-95; A) ventral, and B) lateral view of ovipositor lobes, lamella postvaginalis, ductus bursae, and corpus bursae. 9) Male genitalia of *A. patriciae*, same data as Fig. 6-7, Andrew D. Warren genitalia vial # 95-78; A) dorsal view of distal tip of aedeagus, B) Dorsal view of tegumen and uncus, C) lateral view of left valve, D) lateral view of complete genitalia, minus left valve and juxta.

of *A. patriciae* and worn individuals from Michoacán is in the shape of the tips of the forewings. As seen in Fig. 1-2, the forewing tips of the type of *A. patriciae* appear more rounded than the forewing tips of the Colima male in Fig. 6-7. Closer examination of the forewing tips, however, reveals that this is a false difference. The left forewing tip of the type of *A. patriciae* is damaged. The marginal edge of wing, above vein M1 to the apex is missing. The right forewing tip of the type, although not observably ripped, is deformed. The extreme apex of the right forewing is slightly bent downward and thickened, as if the wing tip was bent while the wing was drying after eclosion, and never fully expanded.

A description of the female of *Amblyscirtes patriciae*, based on the single known female specimen collected by Lamberto González-Cota in Michoacán (Fig. 4-5), follows. Additional notes on external and genitalic characters of the male, not included by Bell or Freeman in their original descriptions, follow the female's description.

Description.—FEMALE. Forewing length (from base to apex): 18.6mm. *Upperside*: Forewing ground color chocolate brown, with very slight

ochraceous overscaling over entire wing surface. Three very small, white, apical spots are arranged in a straight line in cells R3-R4, R4-R5, and R5-M1. A fourth, barely visible, whitish spot in M1-M2, offset distally from the apical spots in cells R3-M1. Two additional, barely visible, yellowish-white spots in cells M2-M3, and M3-CuA1, situated in a line nearly perpendicular to a line formed by the three apical spots. Forewing fringe is checkered; tan to white between wing veins, dark brown at vein ends. Hindwing ground color mostly chocolate brown as on forewing, with a trace of ochraceous overscaling in the discal and marginal areas of the wing. Discal and basal portions of cells Sc-Rs, and Rs-M1 are slightly darker brown than the rest of the wing. Wing fringe colored and checkered as on forewing. *Underside*: Forewing ground color chocolate brown, without ochraceous overscaling, except along the costa. Ground color very dark brown basally, cream-tan along the inner margin and tornus. Three white apical spots in R3-M1 are fairly conspicuous, spots in M1-M2, M2-M3, and M3-CuA1 are barely visible, as on the upperside. All spots are slightly larger and brighter ventrally than on the dorsal surface. Forewing fringe as on upperside. Hindwing ground color very dark chocolate brown; darkest basally, and slightly lighter in cells CuA2-A2, and A2-A3. Entire wing surface lightly overscaled with grayish-white scales. Marginal band of five white spots is barely discernable. Three prominent spots in cells M1-M3, M3-CuA1, and CuA1-CuA2, arranged in a straight line. Two additional white spots, much less pronounced than the others, in cells Rs-M1, and Sc-Rs. Hindwing fringe slightly darker than on upperside, with checkering less obvious.

Head clothed mostly in brown scales dorsally, with scattered, longer, whitish scales throughout. Shorter white scales are concentrated into three spots, one above each eye, and one midway between the two antennae. Ventral surface of the head clothed mostly in long, white scales, with long, black scales intermixed throughout. The first and second segments of the labial palpalae heavily clothed in scattered black and white scales, about half of which are white, half black. Third segment of the palpalae much shorter, and completely covered in short, very dark brown scales. Dorsally, antennae totally black, all the way to the tip of the apiculus, with poorly developed white rings around the base of shaft segments. Ventrally, antennae strongly checkered, with a strong white ring around the base of each shaft segment. The nudum of the apiculus is 13 segments. A very small region of yellowish scales between antennal nudum and brown dorsal scales, along the inner edge of the distal curve of the apiculus. Tegulae clothed in long brown and fuscous scales. Thorax and abdomen clothed in short, dark brown scales dorsally, with longer whitish, and fulvous scales intermixed randomly. Ventral surfaces of the thorax and abdomen heavily clothed in light brown and white scales. Outer surfaces of each leg, as well as inner surface of each femur, covered mostly in dark brown scales, with scattered tan and white scales. Inner side of each leg below the femur clothed completely in tan scales. A large epiphysis present on inner surface of the distal end of fore-tibiae. Below tibiae, all legs have between four and six rows of spines extending down the back of the leg to the terminal claws. Mesothoracic tibiae have one pair of distal spurs, metathoracic tibiae have two pairs of distal spurs.

Genitalia. Complete external female genitalia are illustrated from ventral (Fig. 8A) and lateral (Fig. 8B) views. Ovipositor lobes large and slightly pointed dorso-caudally (Fig. 8B). Each lobe with a lateral row of hairs, running dorso-ventrally, which is expanded into a small patch of hairs laterally. Sclerotized posterior margin of lamella postvaginalis very short, in dorsal and ventral views, and sparsely covered with small bristles. Posterior margin of lamella postvaginalis very slightly V-shaped, except at the midventral notch where it is strongly V-shaped (Fig. 8A). Well sclerotized ductus bursae strongly bent at midpoint, as seen in dorsal and ventral views. Anterior half of the ductus bursae bears a deep groove (deepest anteriorly), which becomes shallower as it bends from

the ventral side (anteriorly), to where it disappears on the lateral edge of the ductus bursae at its midpoint. Corpus bursae very narrow posteriorly. Just anterior of junction with ductus bursae, the corpus bursae is dorso-ventrally constricted, and heavily wrinkled longitudinally (Fig. 8B). Anterior two thirds of corpus bursae much wider than posterior third, smooth, and evenly rounded, without wrinkles.

MALE. Freeman (1970) provided a sufficient description of the male of *A. patriciae* in his original description of *immaculatus*. A male in fresh condition from Platanarillos, Colima is shown in Fig. 4-5. Average forewing length (of 21 males measured): 17.2mm (extremes of 16.8 and 18.0mm). Average antennal nudum (of 19 males counted): 13.8 segments (extremes of 12 and 16 segments). Head, antennae, thorax, abdomen, and legs, although not described by Bell or Freeman, are essentially the same as on the female, described above.

Genitalia. The complete external male genitalia are illustrated in Fig. 9A-D. Tegumen fairly short, moderately broad, and dorsally hollowed (Fig. 9B). A slender, dorso-caudal projection arises from the tegumen, and bends down toward the uncus (Fig. 9D). Uncus is bifurcate, with both lobes very short, and strongly bent downward. Gnathos also bifurcate, with very short lobes, strongly bent upward. Distal ends of uncus and gnathos almost meet. Valvae symmetrical, fairly long, and fairly broad. Valvae broadest cephalad, becoming gradually narrower caudad. Ampulla and harpe overlap at caudal end of valvae, with ampulla displaced inward, as seen in Fig. 9C. The tip of the harpe is pointed dorsally, with an additional inward pointing process below the dorsal tip, as seen in Fig. 9C-D. Distal portion of harpe extends caudad of the point where ampulla and harpe meet. Aedeagus very long, and smooth, except at distal end. Aedeagus laterally bifurcate at distal end. Each caudal projection with an irregular lateral row of spines, extending to its distal tip. Caudal projections joined dorsally by a smooth expansion of the cuticle, extending dorsally and laterally above and beyond the caudal projections, as seen in Fig. 9A,D. Expansion of cuticle most pronounced about halfway between the origin of the two projections, and their caudal ends, as seen from a dorsal view in Fig. 9A. This structure is totally symmetrical on both caudal projections. Saccus (Fig. 9D) very long, but not as long as the aedeagus. The male genitalia of *A. patriciae* are compared to the genitalia of *A. folia* and *A. raphaeli* below under Remarks.

Deposition of specimens.— Individual male specimens of *patriciae* from Colima or Michoacán have been deposited in the following collections: Allyn Museum of Entomology (AME), American Museum of Natural History (AMNH), British Museum of Natural History (BMNH), Carnegie Museum of Natural History (CMNH), Cornell University Insect Collection (CUIC), Denver Museum of Natural History (DMNH), National Museum of Natural History, Smithsonian Institution (USNM), and the Ray E. Stanford collection (RES). All remaining specimens are distributed among the collections of the Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autónoma de México (MZFC), Lamberto González-Cota (LGC), and the author (ADW).

Distribution.— *Amblyscirtes patriciae* appears to be reasonably well distributed in seasonal tropical forest areas from at least Colima (and probably southern Jalisco), through west-central Michoacán, into the Sierra Madre del Sur in Guerrero. The known distribution of *A. patriciae* in Mexico is shown in Fig. 10. Hugh Avery Freeman (pers. comm., 1995) has examined specimens of *A. patriciae* from Oaxaca and Chiapas, but the data from those specimens is unfortunately not available. This species should also be found in Puebla and in Morelos near the border with Guerrero. Only one specimen, the holotype male, is known from Guatemala. Freeman (pers. comm., 1995) examined one fresh male (housed in the CMNH) of *A. patriciae* from El Refugio, near El Imposible, Dept. Ahuachapan, El Salvador, collected on 3-4 July 1991 by Victor Hellebuyck. This species should be watched for, perching, along any small creek in seasonal, tropical forested canyon bottoms at

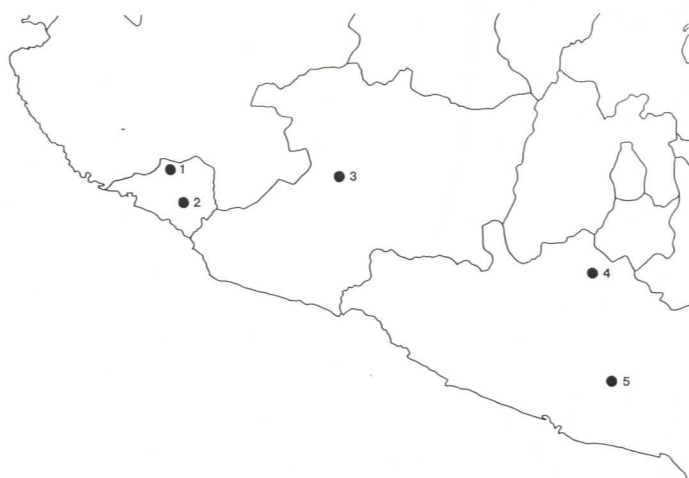


Fig. 10. Distribution of *Amblyscirtes patriciae* in southwestern Mexico: 1) Platanarillos, Colima; 2) La Salada, Colima; 3) Planta Hidroeléctrica Cupatitzio, Gabriel Zamora, Michoacán, Mexico; 4) Iguala, Guerrero; 5) Acahizolta, Guerrero.

middle elevations from southern Jalisco, south-east through Guatemala.

This same pattern of distribution in seasonal, tropical forests, from western Mexico southeast along the west coast ranges, at least into central Guatemala, is shared with other poorly known skipper species such as *Phanus rilma* Evans, 1952 (as detailed by Austin, 1993), *Codatractus sallyae* Warren, 1995 (as detailed in the original description), and probably also "*Poanes*" *benito* Freeman, 1979 (it is known from Jalisco, Colima, and Chiapas, but not yet from Guatemala), a species that has not been placed in an appropriate genus (Burns, 1992). Butterflies sharing this distributional pattern have been studied by Llorente and collaborators (see also Vargas *et al.* (1994).

Remarks.— The genitalia of *A. patriciae* are very similar to the other large *Amblyscirtes*, especially *A. folia* and *A. raphaeli* (*A. exoteria* (Herrich-Schäffer, 1869) is also very closely related to these other three large species, but is not included in the following comparison). Despite what has been said about the overall similarity of all *Amblyscirtes* genitalia by Lindsey *et al.* (1931), and the supposed inability to differentiate similar species based only on their genitalia by Freeman (1973), *A. patriciae* can readily be distinguished from its two closest relatives, *A. folia* and *A. raphaeli*, by comparing the male genitalia (the female of *A. raphaeli* is still unknown). In both *A. folia* and *A. raphaeli*, the dorsal edge of the valvae is very straight, much straighter than in *A. patriciae* (Fig. 9C). The harpe extends much farther caudad (from the point where the ampulla and harpe meet) in *A. patriciae*, than in it does in either *A. folia* or *A. raphaeli*. The projection on the inner surface of the harpe of *A. patriciae*, best seen in Fig. 9D, is very similar to the projection on the inner surface of the valvae of *A. raphaeli*. The projection is better developed in *A. folia*. The caudal tip of the harpe extends the farthest dorsally in *A. raphaeli* (as accurately illustrated in Freeman's (1973) original description), almost as far in *A. patriciae* (Fig. 5C,D), but not nearly as far in *A. folia*. The overall length of the aedeagus is approximately the same in *A. patriciae* and *A. folia*. Despite the larger overall size of *A. raphaeli*, its aedeagus is shorter than in *A. folia* and *A. patriciae*. The distal tip of the aedeagus of all three species is laterally bifurcate, and symmetrical (Fig. 9A), unlike that of the smaller, North American *Amblyscirtes*, as illustrated by Burns (1990). In all three large,

tropical species, each of the two caudally projecting processes at the distal tip of the aedeagus have lateral spines, and are fused dorsally by a smooth dorsal and lateral expansion of the cuticle. This unusual expansion is best developed in *A. folia*, where it extends laterally beyond the outer edge of the distal projections (from a dorsal view), all the way to the caudal tips of the projections: the projections at the distal tip of the aedeagus almost always overlap in *A. folia*, frequently overlap in *A. patriciae*, but never overlap in *A. raphaeli*. This structure is also well developed in *A. patriciae*, where it extends laterally beyond the distal projections only for a small distance halfway between the origin and distal tip of the caudal projections, as seen in dorsal view in Fig. 9A. This structure extends dorsally in *A. folia* to about the same extent as it does in *A. patriciae*, as seen in Fig. 9D. In *A. raphaeli*, this structure does not overlap the lateral edges of the projections from a dorsal view, but extends farther dorsally at the caudal tip of the projections than in either *A. patriciae* or *A. folia*, from a lateral view. The uncus of *A. patriciae*, as seen in Fig. 9D, is almost identical to the uncus of *A. folia*. The uncus of *A. raphaeli* is longer, and more strongly bifurcate than in *A. patriciae* (Fig. 9B). The saccus of *A. folia* is the longest of the three species, followed by *A. patriciae*, and *A. raphaeli*, with the shortest saccus.

It would not be surprising if Central American populations of *A. patriciae* were found where even fresh individuals lacked white apical spots on the forewings. All other species of *Amblyscirtes* that have extensive distributions from north-western Mexico, into tropical life zones in southern Mexico, including *A. folia*, *A. tolteca*, and *A. elissa* Godman (1900), have paler, better marked populations to the north, and darker, poorly marked populations to the south. Dark, southern *A. folia* were once called *A. tutolia* Dyar (1913) (now a synonym of *A. folia*). Bright, well marked, northern populations of *A. tolteca* are called *A. tolteca prenda* Evans (1955), and well marked northern populations of *A. elissa* are called *A. elissa arizonae* Freeman (1993). Both *A. tolteca* and *A. elissa* are very dark, and very poorly marked at the southern limits of their ranges.

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