

BULLETIN OF THE ALLYN MUSEUM

3701 Bayshore Rd.
Sarasota, Florida 33580

Published By
The Florida State Museum
University of Florida
Gainesville, Florida 32611

Number 87

16 May 1984

NEOTROPICAL NYMPHALIDAE. II. REVISION OF MYSCELIA

Dale W. Jenkins

3028 Tanglewood Drive, Sarasota, FL 33579 Research Associate, Allyn Museum of Entomology

A. INTRODUCTION

This is the second in a series of revisions of neotropical nymphalid butterflies. The first published revision was on the genus *Hamadryas* Jenkins (1983). Other genera under study include *Catonephele*, *Ectima*, *Epiphile*, *Eunica*, *Doxocopa* (formerly *Chlorippe*), *Asterope* (formerly *Callithea*) and *Baeotus* (formerly *Megistanis*).

The genus *Myscelia* includes ten species and eight subspecies of medium-sized, neotropical butterflies that are usually bluish or blue-striped. They have distinctive truncate-shaped wings with prominent angles or extensions in the subapical area of the forewings. Both fore and hind wing margins are heavily sinuate with dentations. Most species have white spots and blue bars or stripes. The female wing pattern of some species is almost identical with the females of certain *Catonephele* which were formerly included in *Myscelia*. The wing venation is similar to *Catonephele*, *Eunica* and *Epiphile*. The male genitalia and the hypandrium or subgenital plate in the male is also similar to some *Catonephele*.

The exact limits of the genus *Myscelia* are not well defined. *Myscelia sophronia* (Godart) has been included in the genus by Röber, in Seitz (1916). Hayward (1950), however, created the genus *Sea* which includes only *sophronia* based mainly on wing venation differences. My study of the male genitalia and hypandrium of *sophronia* shows that it does not belong in *Myscelia* and is excluded from this genus.

Myscelia capenas (Hewitson) is anomalous and may be more closely related to *Catonephele* and *Nessaea* than *Myscelia*. *M. capenas* was put in *Cybdelis* by Hewitson (1857), in *Eunica* by Butler (1873), in *Catonephele* by Kirby (1871) and Staudinger (1888) and in *Myscelia* by Röber, in Seitz (1916) and by Smart (1975). It has the dorsal fore wing (DFW) white cross band and the dorsal hind wing (DHW) with ocelli, and often with a rufous band, similar to aberrant *Nessaea arcaea*, but the wing shape with the apical extended and angular DFW is more typical of *Catonephele*. It also has some characteristics of *Cybdelis*. There is blue coloration in *capenas* only in the ocelli, and the male hypandrium with its narrow median constriction is quite different from *Myscelia*. It is tentatively left in *Myscelia* mainly because it fits as well (or as poorly) in

this genus as any other, but it will be studied in revisions of related genera.

Myscelia larvae feed on *Euphorbiaceae*, especially *Dalechampia* and probably *Tragia*. The known larvae are green in color and have branched spines. There are two long spiny antler-like horns terminated by star-like rosettes. The pupae are angulated and are attached to the upper surface of leaves.

Identification of *Myscelia* is rather difficult because of the close relationships of some of the species and subspecies and previous lack of known consistently valid distinguishing characters. There are not a large number of synonyms probably because *Myscelia* specimens from Central America and northern South America were rather rare in older collections. Misidentification in reference books has been a major problem. In the only revision of the genus by Röber, in Seitz (1916), in pl. 99a the figure labeled *M. ethusa* ♂ is actually *M. cyaniris* ♂, the figure labeled *M. cyaniris* ♂ is *M. cyananthe* ♀, the figure labeled *M. rogenhoferi* is *M. ethusa* (*chiapensis* ♀) and *M. cyaniris* ♀ is *M. cyaniris albescens*. This has resulted in many misidentifications of specimens. In Lewis (1973) pl. 39, the figure labeled *M. orsis* ♀ is actually *M. pattenia* ♂ and *M. ethusa* is actually *M. orsis* ♀. In Smart (1975) *M. ethusa* f. *rogenhoferi* is *M. c. cyaniris* ♂. Pyle (1981) states that the Cyananthe Blue Wing, *M. cyananthe*, occurs with some frequency in the United States. (There is one record of *M. c. skinneri* in New Mexico, and no known specimens of *M. c. cyananthe* in the United States.)

The main reason for selecting this genus for revision was that it was impossible to accurately identify collected specimens, and some intergrades indicated unidentified subspecies instead of full species.

The common English name for species in this group is "Blue-wing" or "Purple-wing." No specific common names are presented. These butterflies are apparently too uncommon or local to have indigenous common names in the countries where they occur. The only local name heard was "azules" which is also used for morphos and other blue butterflies.

B. MATERIALS AND METHODS

Myscelia were collected and studied in the field in 12 Latin American countries especially in relation to variation in local populations. Thirty museums and private collections were examined and the *Myscelia* were identified.

Myscelia types in the British Museum (Natural History), the Strecker Collection in the Allyn Museum, the Smithsonian Institution, the Museum of Comparative Zoology and the Carnegie Museum were studied. In revising *Myscelia* (and other nymphalid genera) it has been of value to study both the types and the collections of older authors to help reconstruct and define their species and subspecies. Older collections studied included the Bates, Hewitson, Doubleday, Godman and Salvin, Oberthür, Fruhstorfer, Röber, Joicey, Rothschild, Strecker, Holland, and parts of the Staudinger, Cramer, Boisduval and Felder collections.

In defining species and subspecies, emphasis was placed on variation in the wing coloration, pattern and venation, sexual dimorphism, androconia, male genitalia and hypandria and female genitalia. Field collection data by the author were valuable to determine the range of variation of species and subspecies and intergradation. Keys are presented for males and for females based on wing coloration, pattern and venation. A key is presented for male genitalia and especially the hypandria. Keys to subspecies are included for those species with subspecies.

Data presented for each species and subspecies include taxonomy, distribution, variation, biology, numbers of males and females and a list of geographical locations. Other data including altitudes and dates are summarized, but full details on each specimen, including sex, dates of adult flight, and museum in which it is found are available from the author. Full details are included in this revision only for new and rare species and subspecies.

The nomenclature of wing veins and intraneural cells of the wings follows Miller (1970). The venation of *Myscelia* and nomenclature used are shown in fig. 1. The pattern

of markings on the wings is somewhat complex. The nomenclature used for *Myscelia* in this revision is shown in fig. 2. The terminology for the male and female genitalia follows Klots (1970).

In *Myscelia* as in *Catonephele* and related genera, there is a prominent subgenital plate in the male probably derived from sternite VIII or IX. According to Tuxen (1956) this structure should be called the hypandrium. In the posterior part of the hypandrium

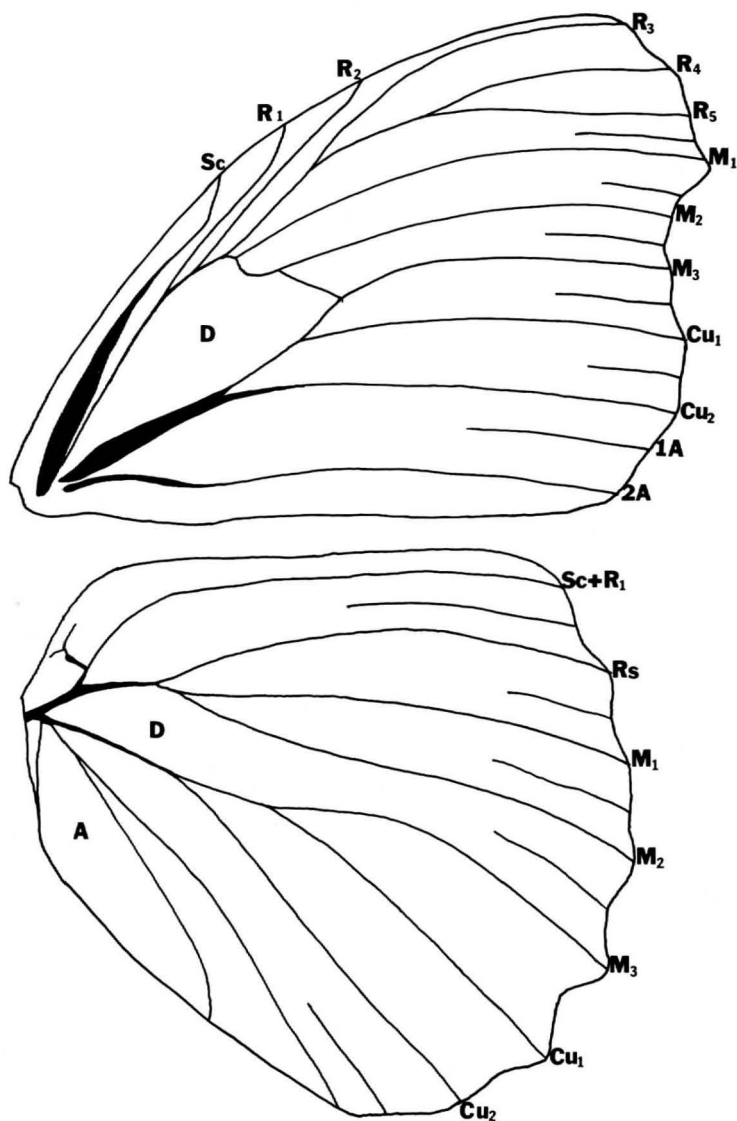


Figure 1. Venation of *Myscelia* showing nomenclature of veins according to Miller (1970).

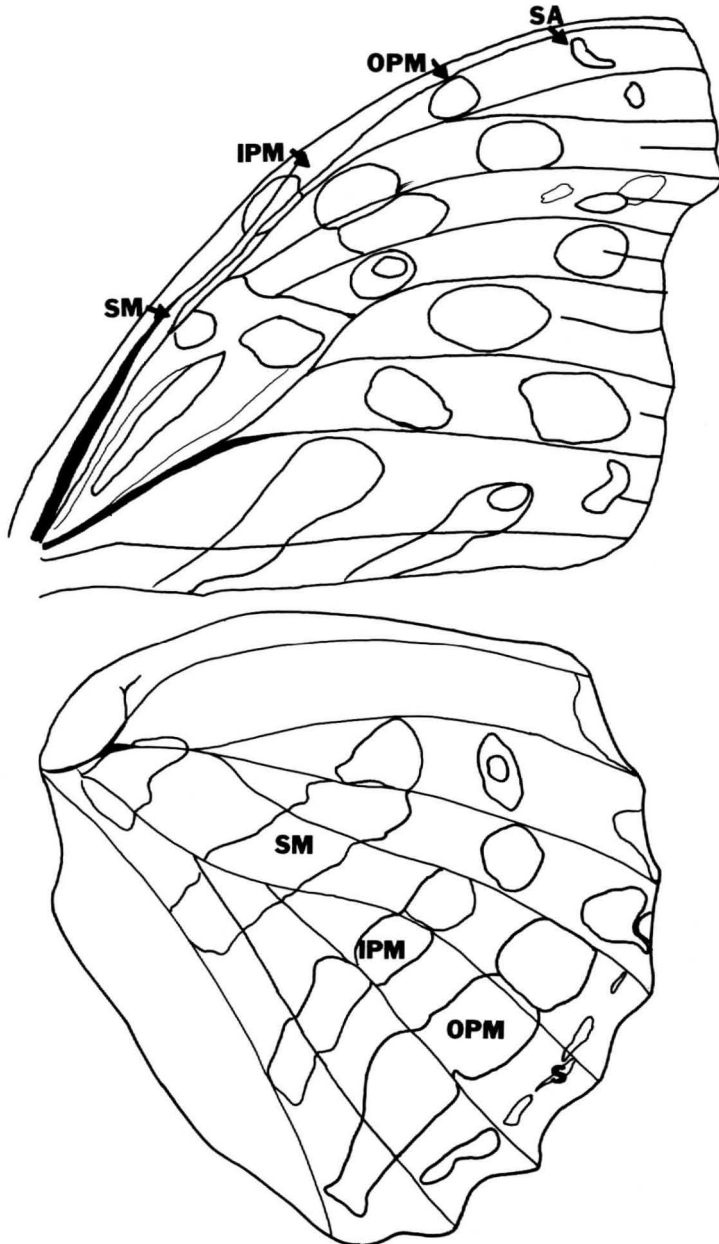


Figure 2. Wing pattern of *Myscelia* showing nomenclature.
 SM = submedian row; IPM = inner postmedian row;
 OPM = outer postmedian row; SA = subapical markings;
 S = submarginal markings.

there are a pair of lateral appendages or rami covered with many spines and setae. They may be related to gonopods. Their function is unknown but may serve as clasping organs during mating.

Male genitalia and hypandria were dissected in 50 male specimens, and 23 female specimens were dissected. They were put in glycerine vials instead of on microscope slides so that the structures, especially the hypandria, could be drawn from different views (all 50X magnification). The vials were numbered and deposited with their corresponding specimens. Dissections of genitalia of types in the BM were mounted on slides.

Distribution maps (figs. 103-108) are based on specimens examined and determined by the author. Combined circles and triangles (or squares) indicate intergrades between subspecies. An X after a locality name also signifies intergrades.

COLLECTIONS EXAMINED

- AA - Allyn Museum of Entomology, Florida State Museum, Sarasota, Fla.
- AD - Alberto Díaz Francés Collection, Mexico City, Mexico
- AK - Andrew King Collection, Turrialba, Costa Rica
- AM - American Museum of Natural History, New York City, N.Y. (F. H. Rindge)
- BM - British Museum (Natural History), London, England (R. I. Vane-Wright, P. Ackery)
- CA - California Academy of Science, San Francisco, Cal. (P. H. Arnaud)
- CB - California Insect Survey, University of California, Berkeley, Cal. (J. Powell)
- CM - Carnegie Museum of Natural History, Pittsburgh, Penn. (G. Ekins and C. Young)
- DM - De la Maza Collection, Mexico City, Mexico
- FC - Museo de Zoología Facultad de Ciencias, UNAM, Mexico City, Mexico (J. Llorente)
- FL - Division of Plant Industry, Florida Dept. Agriculture, Gainesville, Fla.
- GS - Gordon B. Small Collection, Balboa, Panamá
- JC - Dale and Joanne Jenkins Collection, Sarasota, Fla.
- KB - Keith S. Brown Collection, Campinas, Brazil
- LA - Los Angeles Co. Museum Natural History, Los Angeles, Cal. (J. P. Donahue)
- MH - Museo de Historia Natural de Ciudad de Mexico, Mexico City, Mexico
- MM - Milwaukee Public Museum, Milwaukee, Wis. (A. M. Young and S. S. Borkin)
- MN - Museu Nacional, Rio de Janeiro, Brazil (J. Cândido de Mello Carvalho)
- MZ - Museum of Comparative Zoology, Harvard University, Boston, Mass. (J. Weintraub and M. D. Bowers)
- NC - James Neidhofer Collection, Milwaukee, Wis. (in MM)
- PA - Philadelphia Academy of Sciences (in CM)
- RK - Roy O. Kendall Collection, San Antonio, Texas
- SI - National Museum of Natural History, Smithsonian Institution, Washington, D.C. (J. F. Gates Clarke and R. Robbins)
- SH - Sergio Hernandez Collection, Colima, Mexico
- ST - Herman Strecker Collection (at Allyn Museum of Entomology) Sarasota, Fla. (in AA, property of Field Museum of Natural History, Chicago, Ill.)
- TA - Texas A&M University, Department of Entomology, College Station, Texas (S. J. Merritt)
- TE - Thomas Emmel Collection, Gainesville, Fla.
- UN - Universidad Nacional Mayor de San Marcos, Museo de Historia Natural "Javier Prado," Lima, Peru (G. Lamas)
- UP - Universidade Federal do Paraná, Curitiba, Brazil (O. Mielke)
- VK - Harold L. King Collection, Sarasota, Fla.

Over 2,000 specimens of *Myscelia* were studied and identified and 19 different types were studied and compared with other specimens. Color photographs were made of the

types and other critical specimens and the negatives and prints are deposited in the Allyn Museum. Holotypes of three new subspecies described are also in the Allyn Museum.

C. BIONOMICS

Myscelia are restricted to the American hemisphere in the tropical and subtropical region extending from southern Texas and New Mexico through Mexico and Central America to southern Brazil and northern Argentina. Four species are restricted to South America, and one species occurs only in the West Indies on Hispaniola. Five species are primarily Central American, with two species extending into the United States.

M. orsis is fairly common in Brazil and was described two centuries ago in 1782. The other species in South America are uncommon or rare and *M. milloi* is known from one holotype specimen. *M. aracynthia* from Hispaniola is rather rare and *M. leucocyana* from Costa Rica to Venezuela is uncommon. Although *Myscelia* from Central America and Mexico were formerly rare in older collections, they are not uncommon in Mexico in suitable habitats, e.g., I collected 25 *M. cyananthe* in one locality in one day in Morelos, Mexico. An unusual population of *M. ethusa* which was probably a migration into Mexico City occurred in September and October 1983 (de la Maza, pers. comm.).

Myscelia occur in a variety of habitats. In Mexico and Central America they are more common in drier areas especially in stream valleys where they may concentrate in numbers around the few remaining wet or moist places in the dry season. They are found in both uninhabited as well as inhabited and cultivated areas and may be common in some banana plantations. Some of the species occur in roads and openings of forests. They are seen resting on the ground on moist soil, on roads, rocks, on tree trunks, on banana plants and on leaves. They are found at lower elevations and up to

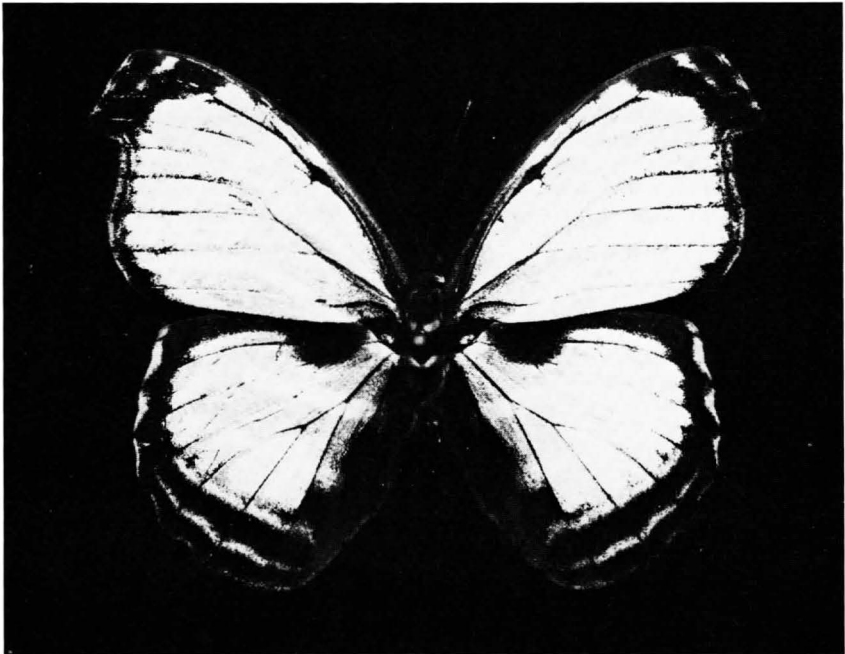


Figure 3. Ultraviolet reflection of male *Myscelia cyaniris*, dorsal surface.

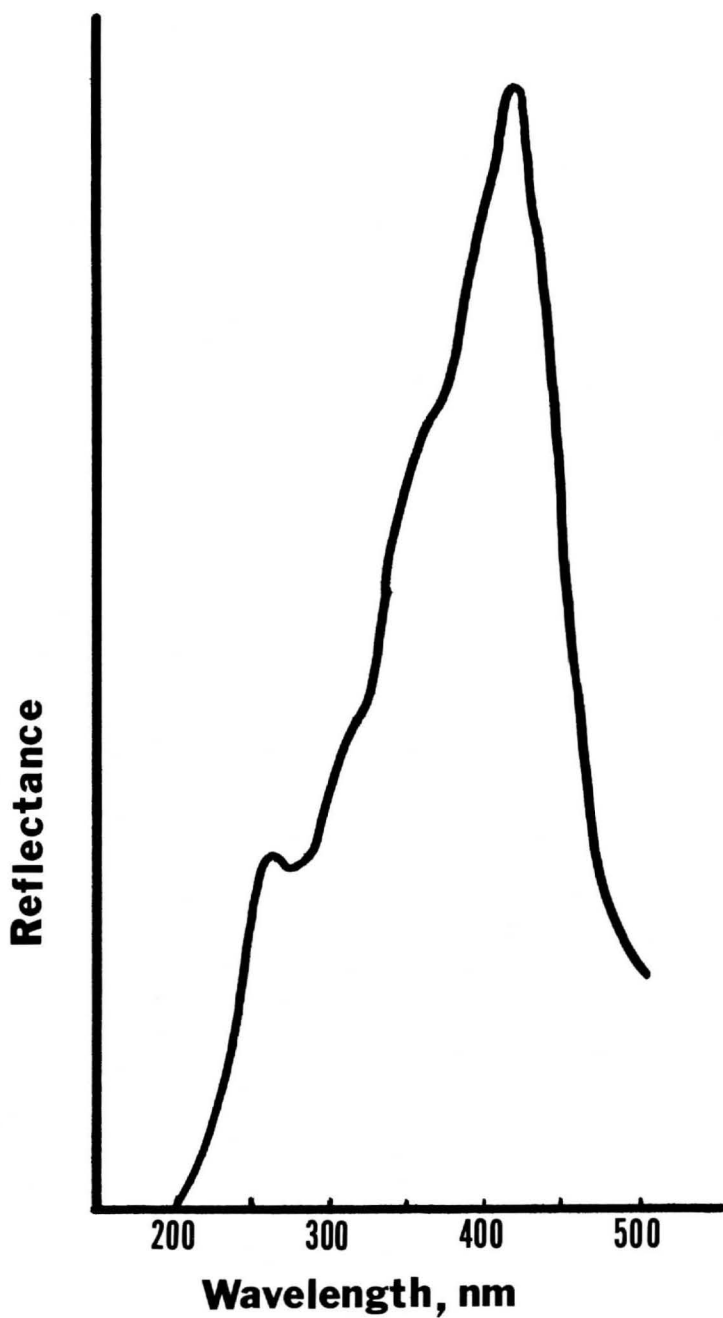


Figure 4. Spectrophotometric analysis of ultraviolet reflectance of blue area of wing of *Myscelia cyaniris*.

about 1,650 m altitude. Adults of most species are found throughout the year but are most common during the rainy season from July to November in Mexico and part of Central America. *M. aracynthia* was collected from mid-July to August.

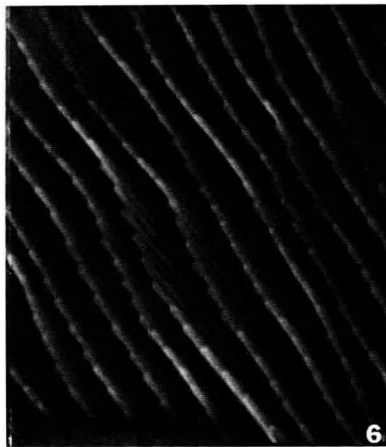
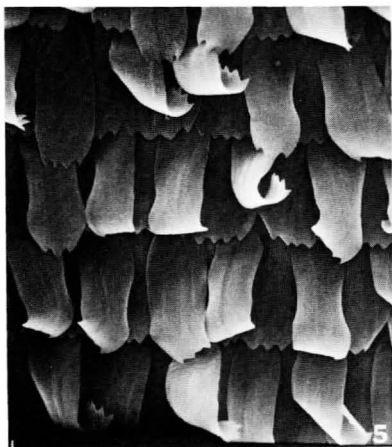
There is very little published information on the behavior of *Myscelia* except *M. orsis*. Since they are relatively uncommon, restricted in their occurrence and furtive in behavior, they have not been studied as much as other attractive nymphalids. *M. orsis* in Brazil frequently fly from leaf to leaf or to other objects where they usually rest briefly and are readily disturbed and fly into bushes. *Myscelia* species in Mexico are attracted to fermenting bananas and other fruit baits and fly rapidly in the vicinity of the fruit but are very wary and seldom settle down and feed on the bait or enter bait traps. I have found the Mexican species highly attracted to small sugar cane presses, where they feed on the fermenting cane and spilled syrup.

I have never found any *Myscelia* feeding on flowers, excrement or carcasses of dead animals. They are attracted to the moist soil around cattle watering sites, which are contaminated by the animals, and to open horse stables. On very hot days some species perch on the sides of stream valleys in shaded areas. They are often found at the exact same sites year after year but do not appear to be territorial. Some species fly back and forth in stream valleys and when disturbed, fly into bushes or into irregular places in stream banks.

A pair of *M. c. cyananthe* was collected in copula on 9 Nov. 1982 at 1600 hours by the author. They were on the steep bank of a dry stream valley at Rancho Viejo, Mexico.

The eggs are laid and the larva feed on *Dalechampia triphylla* Lam. and probably other species of *Dalechampia* and *Tragia*. These are usually vine-like members of the family *Euphorbiaceae*, which frequently contain poisonous alkaloids. The eggs are laid on the under surface of the leaf (in *M. orsis*), and the larvae and pupae occur on the upper surface. The larvae and pupae are green in color in the two species observed.

Ultraviolet photographs were taken of the males and females of most of the species of *Myscelia* by Dr. Arthur C. Allyn. The picture of the male of *M. cyaniris* exhibits ultraviolet reflectance over almost the entire wing surface (fig. 3) differing greatly from the photograph of the same specimen in figure 30, which was photographed using the visible spectrum. The observed blue reflectivity was found at 405 nm. Ultraviolet reflectivity is indicated by the shoulder at approximately 360 nm and a lower peak at 250 nm (fig. 4). Scanning electron microscopy shows the scale arrangement of *M. cyaniris* (fig. 5). The upper "curved" scales are those which produce the blue and ultraviolet reflec-



Figures 5 and 6. Electron microscope pictures of blue scales of *Myscelia cyaniris*. Fig. 5. (300X) shows scale arrangement. Fig. 6. (10,000 X) shows closely packed scutes.

tivity having a series of closely packed scutes forming an interference filter (fig. 6). The vision of many insects including the Rhopalocera includes both the ultraviolet as well as the visible spectrum. Thus figure 3 illustrates a major alteration in the color pattern visible to the insect, adding an additional visual identification pattern *vis a vis* other species in this genus.

D. SYSTEMATICS

Myscelia is a fairly distinct genus that is closely related to *Catonephele*, especially the females, some of which were formerly included in *Myscelia*. As mentioned previously, *M. sophronia* (Godart) was included in *Myscelia* by Röber, in Seitz (1916), but Hayward (1950) described the genus *Sea* for *sophronia*. It has a cross vein that closes the hindwing cell (not found in *Myscelia*) and the male genitalia and hypandrium are very distinct. In a catalogue by Kirby (1871) five species were put in *Myscelia* that are now included in *Perisama*.

The genus *Myscelia* is in the family *Nymphalidae* and according to Miller and Brown (1981) is in the Subfamily *Limenitidinae* Behr, and Tribe *Epicaliini* Müller (closely related to *Eunica*). The presence of a hypandrium in the males may prove to be of value in defining tribes and is being studied in other genera.

The genus is not homogeneous, and it is here split into two species groups, mainly on the basis of the shape of the hypandrium in the male and the wing venation of the forewing (there is perhaps sufficient difference to consider two subgenera).

Hypatia species group.

This includes *M. hypatia*, *M. orsis* and *M. milloi*. Androconia are present in the males, and the hypandrium has an enlarged base and is strongly narrowed posteriorly with a pair of relatively narrow rami. In lateral view the hypandria are not strongly bent. The forewing has the median and subcostal veins not dilated at the base, and the m_2-m_3 is about 2X m_1-m_3 , and the m_1-m_2 is not looped or strongly curved; m_2-m_3 joins M_3 near or up to 1.5 mm distad from the juncture of M_3-Cu_1 ; the margin of the wing is expanded at Cu_1 and the hindwing at M_3 .

Cyaniris species group.

This includes *M. cyaniris*, *M. aracynthia*, *M. leucocyana*, *M. ethusa*, *M. pattenia*, and *M. cyananthe*. Small androconia are present only in *cyaniris*. The hypandrium is broader posteriorly with wider rami. In lateral view the hypandria are bent angularly. The forewing has the median and subcostal veins dilated at the base, the m_2-m_3 is about as long as m_1-m_3 , and m_1-m_2 is curved or looped; m_2-m_3 joins M_3 at least 2.0 mm or more distad from the juncture of M_3 and Cu_1 . There is little or no extension of forewing margin at Cu_1 or hindwing margin at M_3 .

Other characters such as wing pattern and color, presence of male androconia do not always fit into the species groups so that the possible value of subgenera would be of limited usefulness. *M. capenas* does not fit into either of these species groups and would require a separate group if it really belongs in the genus *Myscelia*.

Keys are presented for adult males, females and male genitalia and hypandria. They are complete except for the female of *M. milloi* which is unknown.

Description:

Adult. Antennae long and slender with 41 segments, the terminal twelve form a moderate club. The palpi are hairy, the terminal joint rather long, middle joint not swollen. The front legs of the male are somewhat hairy, the middle posterior legs moderately spined.

The predominant wing color is blue in the male. The forewings are truncate and have

prominent angles or extensions (at M_1) in the subapical area (fig. 1). R_1 & R_2 branch before the end of the discal cell. In *M. capenas* and *M. orsis* m_2-m_3 is 2X m_1-m_2 and in the other species becomes shorter or near equal in length and m_1-m_2 becomes more looped especially in *M. cyananthe* and *M. ethusa*; m_2-m_3 joins M_3 near the junction of M_3 and Cu_1 in *M. capenas*, about 1.5 mm distad in *M. orsis* and 2.0 mm or more distad in the other species. The costal and median veins are swollen near the base and gradually attenuate. The hindwing margins are heavily sinuate with dentations. The marginal area in M_3 is extended in the more primitive species *M. hypatia*, *orsis*, *milloi* and *capenas*.

There is a marked sexual dimorphism in nearly all of the species. In male *M. hypatia* and *M. orsis* the posterior margin of the forewing of the anal cell is outwardly convex, and there are black androconial patches at the bases of the forewings and hindwings. In *M. cyaniris* there is a small black patch which is missing in all other species. The ventral surfaces of the wings are usually heavily mottled or marbled with complex patterns.

The male genitalia are fairly similar, varying mainly in the length and curvature of the saccus and the length and shape of the gnathos arm.

The characters of the hypandrium are more important in *Myscelia* than the male genitalia, and both dorsal and lateral views are presented for each species as shown in figs. 82-93. There are no important differences in either the male genitalia or hypandria between the subspecies. The importance of the hypandrium is shown in the key to male genitalia and hypandria for the genus.

The female genitalia are of value for separating species, especially the chitinized part of the ostium bursa or sterigma, the atrium and lamella antivaginalis. These are illustrated for each species (except *M. milloi*) in figs. 94-102. The corpus bursa may be small or large depending on the presence of spermatophores. There are two parallel rows or bands of signa but they did not show significant differences. The papillae anales showed some differences between species and could be used for differentiating them.

Egg. The egg of *M. orsis* is about one mm in size, pale yellow, ellipsoid and obtuse at the ends (d'Almeida, 1922). It is nearly hemispherical, slightly oval and broader below. It has fine transverse stripes and is covered with 10 or 11 longitudinal veins which become narrower but higher toward the top, not reaching the pole. The eggs are laid and attached to the lower surface of leaves (Müller, 1886).

Larva. The fourth instar larva of *M. orsis* is described by Müller (1886) (quoted by Röber, in Seitz (1916), as follows:

"In the last stage the larva is 16 to 28 mm long, the head is green from each side of which, like antlers, there rises a horn of about three times the diameter of the head. These light-brown horns are in two places shortly ramulous, and on their top there is a star-like formation (rosette), the segments of the body show short branched green spines in varying numbers, the body is green with numerous white papillae after the 1 or 2, skinning the animal, when at rest, takes up a position in which the body in its entire length is lying flat on the leaf, the head being lowered in such a way that the points of the horns are touching the leaf (defensive position). During the first two stages the little larva gnaws off the leaf as far as the ribs on which it deposits its faeces."

d'Almeida (1922) states that the fourth instar larva of *M. orsis* is 29 mm, cylindrical and narrowed at the extremes. There are nine rows of spines with black points, the lateral are green with black and yellow rings. On the lower lateral surface there are simple and bifid spines and the patterns are yellowish orange. The last somite has three small white dorsal spines. The head is black and flattened.

No other species of *Myscelia* larvae are known to have been described. A larva identified as *M. cyaniris* was photographed by Frank R. Hedges at Cd. Valles, Mexico on May 26, 1979 (fig. 7). This photograph shows that the fourth instar larva is cylindrical and somewhat narrowed at the ends, green in color with numerous white papillae. There are nine rows of dark and light-banded spines. The reddish green head has a pair of spiny antler-like antennae with a star-like rosette at the tip of each.

Pupa. The pupa of *M. orsis* is described by Müller (1886) as follows:

"The pupa is somewhat flattened out, especially at the posterior parts, on the dorsum

except the 2. segment, without any edge, appearing therefore, when seen laterally, rather slender, from above, especially in the region of the segments 5-7 broad, from here towards the front a little, towards the back considerable reduced in width, it is little tuberos, 2 short conical points at the head, a tapering edge on the 2 segment, a very prominent, smooth edge of the wings, 3 movable connections of the segments, rather freely movable in all directions, the end of the abdomen is like in *Ageronia* broad, flattened down. The pupa is fastened to the upper surface of the leaves, raises itself under the effect of the light and turns itself toward the light."

d'Almeida (1922) states that the pupa is 21 mm and angulated; the color of the abdomen is green speckled with white. The upper part of the wings has a rose tint and a pattern of obscure points. The pupa adheres to the upper surface of the leaf.

A pupa identified as *M. cyaniris* was photographed by Frank R. Hedges at Cd. Valles, Mexico (fig. 8). It is light green in the abdominal area, with dark green "eyes" and pink veins at the bases of the primordial wings. The pupa is angular with dark green interior-



Figure 7. Larva of *Myscelia cyaniris*, Cd. Valles, Mexico.

Figure 8. Pupa of *Myscelia cyaniris*, Cd. Valles, Mexico.

ly. It is suspended by a cremaster fastened to the upper surface of the leaf.

Myscelia cyaniris cyaniris was reared from the egg to adult stage by Gordon Small, who kindly made his notes, photographs, and preserved specimens available.

Eggs were oviposited and found on young tender leaves of a seedling of *Adelia triloba* (Müll. Arg.) (Hemsl) of the *Euphorbiaceae* on 13 May 1983 at Cana in Darién Province, Panamá.

First-instar larvae are green dorsally, yellow-green laterally, with a white or green head, and black feet and prolegs. The fourth-instar larvae are green dorsally, sprinkled with faint yellow tubercles. Dorsolaterally these tubercles are larger and more strongly pigmented. There is a darker green lateral band and a thin yellow band sublaterally. The feet and prolegs are light green with white at the extremities. The bases of the dorsolateral scoli (chalazae) are orange yellow, especially prominent and darker on thoracic (Th.)-3. The head is black with a white frontal triangle. There is a dorsolateral series of scoli, a dorsal series: abdominal (abd.)1-8 (two on abd. 7), a supraspiracular, infraspircular, and supraventral series; head horns alternate in color black-white-black-white-black. Fifth-instar larvae (28 mm in length) appeared after one month and the coloration of the 4th-instar gradually lost the yellow dorsolateral coloration. The head is grayish-black with white frontal area, base of head pinkish, body green with transverse rows of very fine pale tubercles. A dorsal row of scoli on abd. 1 to abd. 8 (with two on abd. 7); dorsolateral row: Th. 1-abd. 9; suprastigmatal, substigmatal and supraventral rows also; all scoli rather fine and most are branched. Other fifth-instar larvae retained the dorsolateral yellow band and the bases of the spines were orange-yellow being especially prominent on Th. 3 and abd. 7 & 8. Adults emerged after 45 to 47 days from egg laying.

KEY TO MYSCELIA MALES

- | | | |
|-----|--|-------------------|
| 1a. | Dorsal forewing (DFW) with posterior edge convex rounded; dorsal hindwing (DHW) with large black androconia in costal area; posterior edge of wing at M_3 elongated | 2 |
| 1b. | DFW with posterior edge not markedly convex rounded; DHW with no large black androconial area (or very reduced); posterior edge of wing at M_3 not elongated (slightly in <i>capenas</i>) | 4 |
| 2a. | DFW dark with one white submedian spot and three postmedian white maculae; DHW dark brown with a postmedian row of five lunar-shaped whitish maculae (very rare, French Guiana) | <i>milloi</i> |
| 2b. | DFW bright blue without prominent white maculae; DHW bright blue without postmedian row of maculae | 3 |
| 3a. | DFW with blue in basal half only, distal half and costal area black; no reddish brown in subapical angle; no median light blue spots present | <i>hypatia</i> |
| 3b. | DFW with blue over most of wing except reddish brown in subapical angle and outer edge; light blue spots present in median area | <i>orsis</i> |
| 4a. | Large species (>35 mm) mostly iridescent blue; DFW with wide postmedian white diagonal band of two large white areas (restricted to Hispaniola) | <i>aracynthia</i> |
| 4b. | Smaller (<35 mm); not mostly iridescent blue, with large white maculae. (not on Hispaniola) | 5 |
| 5a. | DFW grey or brown with two large white postmedian maculae; three or four light blue spots present in basal half; DHW with black postmedian ocelli | <i>capenas</i> |
| 5b. | DFW without two large white postmedian maculae or spots in basal half; DHW without postmedian ocelli | 6 |
| 6a. | DFW with a curving row of four white submedian maculae, an inner postmedian row of four to six white maculae, an outer postmedian row of | |

- four white maculae and two subapical narrow elongate markings *leucocyana*
- 6b. DFW without four white submedian maculae 7
- 7a. DFW with base color bright blue; an elongate white central longitudinal stripe extending to distal end of discal cell *cyaniris*
- 7b. DFW with base color black; no white longitudinal stripe in discal cell 8
- 8a. DFW with outer $\frac{2}{3}$ black, with only two blue or white maculae in outer postmedian row; DHW black with two broad bluish bands or a purple basal area *cyananthe*
- 8b. DFW with at least four white maculae in outer postmedian row, numerous blue or white maculae in inner postmedian row 9
- 9a. DFW with a single white submedian spot in Cu_1-Cu_2 , an inner postmedian row of about five white maculae; DHW with inner postmedian row widely split into two nearly complete rows of blue spots (including M_2-M_3) *pattenia*
- 9b. DFW with no white submedian spot in Cu_1-Cu_2 , none to two inner postmedian white spots; DHW with inner postmedian row usually split from 2A to Cu_1 or M_3 , M_2-M_3 entire, rarely split by fine line *ethusa*

KEY TO MALE GENITALIA AND HYPANDRIA IN *MYSCELIA*

- 1a. Basal half of hypandrium broader than apical half; hypandrium gently curving in side view, rami thin and narrow 2
- 1b. Basal half of hypandrium narrower than apical half; hypandrium greatly angled in side view; rami broad and divergent 5
- 2a. Hypandrium greatly narrowed near middle with rami long and narrow each ending in a club-shape and covered with spines *capenas*
- 2b. Hypandrium not greatly constricted near middle; rami not club-shaped 3
- 3a. Hypandrium bulbous in middle; rami pointed inwardly with many large setae or thin spines; valvae with a large incurving pointed projection at tip; gnathos arm 0.9 mm in length *milloi*
- 3b. Hypandrium basally expanded, rami flat at tip, expanded inwardly to a point, with about five to seven prominent spines on tip 4
- 4a. Gnathos arm more elongate 1.2 mm *orsis*
- 4b. Gnathos arm shorter 0.8 mm *hypatia*
- 5a. Hypandrium broad, expanding from base to lateral rami without any constriction 6
- 5b. Hypandrium with definite constriction before joining to lateral rami 8
- 6a. Saccus elongate, 2.8-3.0 mm; valvae with projection at crista about $\frac{3}{4}$ width of valva *leucocyana*
- 6b. Saccus shorter, 1.6-1.7 mm; valvae with projection at crista elongated to width of valva 7
- 7a. Rami covered with large number of thick spines gradually becoming larger toward base *cyaniris*
- 7b. Rami covered with many thick spines, but several basal spines are very much larger *aracynthia*
- 8a. Saccus curving dorsally; gnathos arm 1.3-1.5 mm *cyananthe*
- 8b. Saccus not curving dorsally; gnathos arm 1.1-1.2 mm 9
- 9a. Lateral rami with none to two elongate inner large basal spines *pattenia*
- 9b. Lateral rami with three or four large inner basal spines *ethusa*

KEY TO *MYSCELIA* FEMALES

- 1a. DFW with bright blue basal color, with large white postmedian maculae, size large (>35 mm) (Hispaniola only) *aracynthia*
- 1b. DFW without bright blue base color 2
- 2a. DFW grey brown with large postmedian white diagonal band; DHW with black postmedian ocelli *capenas*
- 2b. DFW without large postmedian white band; DHW without black postmedian ocelli 3
- 3a. DFW with a basal longitudinal white stripe in discal cell 4
- 3b. DFW without a basal longitudinal white stripe in discal cell 7
- 4a. DHW with three cross bands including a row of submedian and a row of inner postmedian white maculae and a thin submarginal band 5
- 4b. DHW with four cross bands 6
- 5a. DFW subapical distal angle black *hypatia*
- 5b. DFW subapical distal angle red *orsis*
- 6a. DFW with a small, narrow, basal, longitudinal streak extending about $\frac{1}{2}$ length of discal cell; median row with four white maculae *leucocyana*
- 6b. DFW with prominent white longitudinal stripe extending full length of discal cell; median row with one to three white maculae *cyaniris*
- 7a. DFW with only one submarginal white macula in M_2 - M_3 , DHW submarginal band usually thinner and broken into dashes *cyananthe*
- 7b. DFW with three (rarely two) white maculae in M_2 - M_3 , including a small postmedian white spot beyond discal cell, a large subapical white spot, and a usually elongate macula between (these may be fused together); DHW submarginal band thicker and usually continuous or dissected by black veins 8
- 8a. DFW with outer postmedian white maculae in M_1 - M_3 diffuse and elongate and may extend distally into inner postmedian white spot (may form a continuous white stripe) *ethusa chiapensis* & *pattenia*
- 8b. DFW with outer postmedian white maculae in M_1 - M_3 not usually diffuse and elongate and not fused together *ethusa ethusa*
(The females of *pattenia* and *ethusa* are variable and cannot always be differentiated.)

PHYLOGENY

A very interesting phylogenetic or evolutionary sequence is postulated for *Myscelia* in which morphological, ecological, and geographic factors provide mutually supporting evidence. This sequence begins in the lower Amazon tropical forest where the more "primitive" species occur ("center of origin").

A "center of distribution" occurs in northern South America where dispersal of several lines occur and where there is differentiation of species and subspecies. There is a major advance through Central America and Mexico and it appears that a secondary "center of differentiation" occurs. For the *cyaniris* line of dispersion this extends into the tropical rain forest, including *c. cyaniris* and *c. alvaradia*. There is an important adaptation to and colonization of dry areas including the deciduous tropical rain forest and extending into various types of dry regions including thorny scrub and mesquite areas. This includes the various subspecies of *M. ethusa* and especially *M. cyananthe*. This geographic advance extends through Mexico to the southern United States and the isolated Baja California peninsula where the more "advanced" species and subspecies occur. This is illustrated in figs. 9 and 10.

Several major morphological sequences occur concurrently with this geographic advance of the genus. The first is the broadening of the male hypandria posteriorly, with the rami becoming more extended. There is also increased angularity in the lateral view of the hypandria. The saccus of the male genitalia becomes much shorter (less than one-

half). In the wing patterns, there are series of reductions in white maculae on the forewing and reduction of bands on the hindwing. Perhaps most surprising is that concurrent with the reduction of maculae in both males and females there is a saltation or "hop-scotch" reverse transfer of male and female wing patterns between species.

The female wing marking pattern of *Catonephele nyctimus* is almost identical with the female wing pattern of *Myscelia hypatia* and *M. orsis*, while the males of these species have almost unmarked blue wings. The male of *M. milloi* attains much of the female pattern, and this is increased in *M. cyaniris* which appears to be the basic form from which other *Myscelia* (except *capenas*) were derived. From this basic pattern there is a slight increase in markings in both male and female *M. leucocyana* in which there is not much sexual dimorphism. *M. aracynthia* appears to be directly derived from *M. cyaniris* and isolated in Hispaniola. *M. cyaniris* goes through a reduction series in the four subspecies from *albescens* to *millerorum* (isolated in Ecuador) and through nominate *cyaniris* in Central America and Mexico finally reduced in pattern to *alvaradia* in western Mexico. *M. pattenia* of Central America has similar male and female forms, but in *M. ethusa ethusa* in Mexico the male loses many white maculae. In *M. cyananthe cyananthe* the male loses most white and blue maculae while the female is similar to female *ethusa* and male *pattenia*. This is strikingly shown in a gynandromorph (fig. 11). In *M. cyananthe skinneri* and *M. c. streckeri* the females have the male pattern of white maculae of *ethusa*! The males show increased reduction of blue bars until *streckeri* (isolated in the Baja California peninsula) has only stubby basal

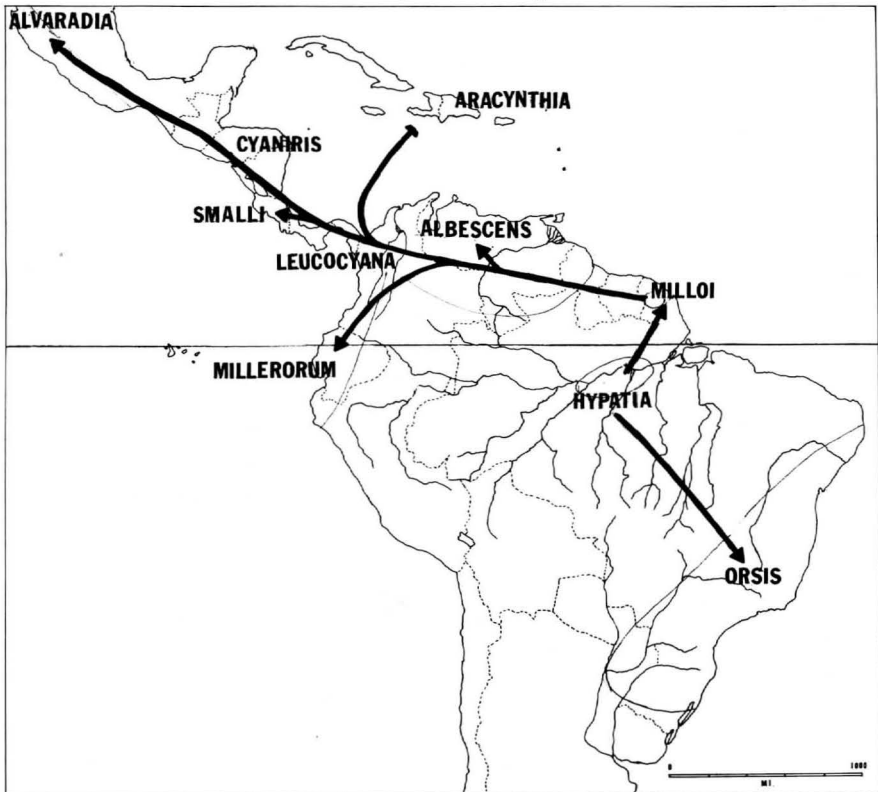


Figure 9. Phylogenetic evolution and geographic spread of *Myscelia* from "Center of Origin" (*Myscelia hypatia*).

purplish patches and no cross bars.

The widespread present-day distribution of the genus from Southern Brazil to southern United States and Baja California suggests that dispersal has occurred over a fairly long period of time. Two isolated taxa of the genus may provide clues to the geological period involved. *M. aracynthia* is well differentiated and isolated on Hispaniola. The Greater Antilles were formed by plate tectonic events by eastern movement in the middle to late tertiary (Rosen, 1976). *M. aracynthia* appears to be derived from *M. cyaniris* stock and may indicate the relative time of dispersal. *M. cyananthe streckeri* is also well differentiated and isolated on the Baja California peninsula. Originally this peninsula was a part of mainland Mexico and separation began at least four million years ago. The separation was complete by Late Miocene or Early Pliocene (Moore and Buffington, 1968). It can be speculated that dispersal may have occurred by then. However, the distance involved from the mainland does not preclude more recent dispersal. The differentiation from *M. c. skinneri* in loss of wing pattern, color change, and full adaptation to scrub-thorn desert suggests earlier dispersal.

Character states have been studied in relation to whether they are primitive or advanced. The characters considered "primitive" in *M. hypatia*, *M. orsis*, *M. milloi* (and partly in *M. capenas*) are:

1. Male DFW with posterior margin of forewing convex outwardly (except *capanas*).
2. Black androconial hairs on DFW and DHW (except *capanas*).
3. Forewing margin extended at Cu_1 and hindwing extended with a small tail at M_3 .
4. Hypandrium narrowed at base of rami.
5. Hypandrium not angularly bent in side view.

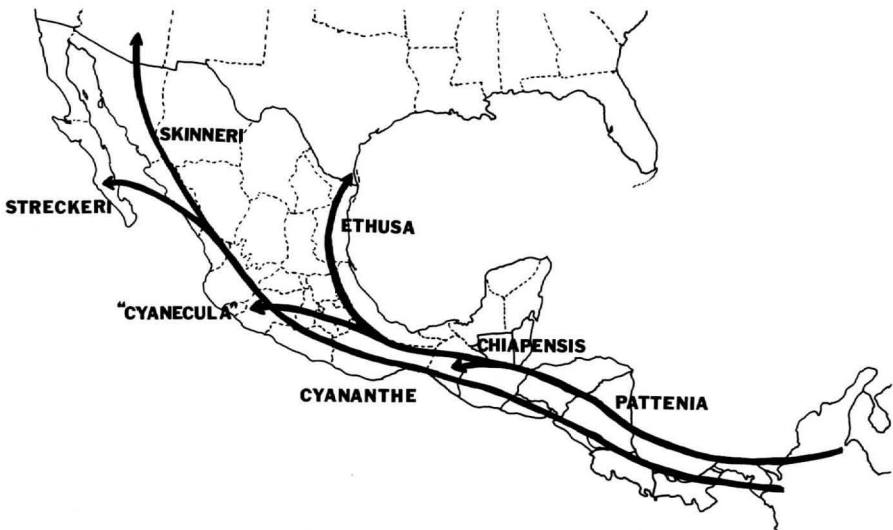


Figure 10. Phylogenetic evolution and geographic spread of *Myscelia ethusa* and *Myscelia cyananthe*.

6. Strong sexual dimorphism with little wing marking pattern in male but complex in female (similar to *Catonephele*).
7. Male saccus relatively long and straight.
8. Occurs in tropical rain forest instead of dry areas.
9. No subspeciation (except *capenas*).
10. Not typically found in human populated and cultivated areas (except *orsis*).
11. Relatively limited in geographic distribution (parts of South America only).

The characters considered "advanced" which include *M. cyaniris*, *M. leucocyana*, *M. pattenia*, *M. ethusa* and *M. cyananthe* are:

1. Male DFW with posterior margin of wing straight.
2. No black androconial hairs on DFW and DHW in males (slight in *cyaniris*).
3. Forewing margin not extended at Cu_1 and hindwing not extended at M_3 .
4. Hypandrium broadened at base of rami.
5. Hypandrium angularly bent in side view.
6. Sexual dimorphism is decreased (but reverses and becomes dimorphic again in *cyananthe* and *ethusa*).
7. Male saccus short.
8. Occurs in relatively dry areas especially in stream valleys (except *cyaniris*).
9. Subspeciation typical (except *pattenia*).
10. Often found in human populated and cultivated areas.
11. Broad geographic range including northern and western South America, Central America, Mexico and southwestern United States.

Myscelia capenas is intermediate with both "primitive" and "advanced" characteristics. *M. aracynthia* is typically "advanced" except for geographic range and lack of subspeciation related to island isolation.

This proposed phylogenetic sequence provides a fascinating theory that will be fur-

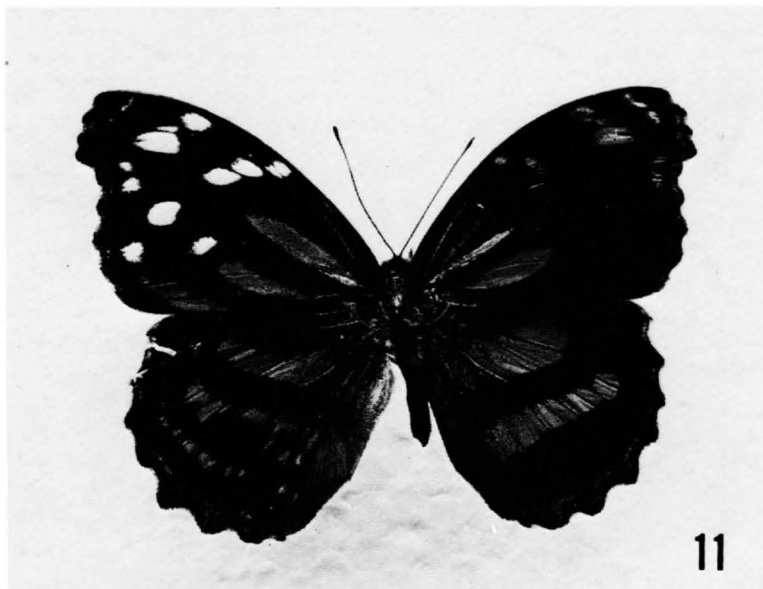


Figure 11. Gynandromorph of *Myscelia cyananthe*. Male is on right side, female on left.

ther analysed in planned future cladistic and vicariance studies.

ACKNOWLEDGEMENTS

I am pleased to acknowledge the assistance of people who have provided help in revising this genus. Dr. Lee D. Miller, Jacqueline Y. Miller, Javier de la Maza and Dr. Keith S. Brown, Jr. reviewed the manuscript and made helpful suggestions. Dr. Arthur C. Allyn made ultraviolet reflection pictures of all species, helped on photographic illustrations, and provided valuable comments.

Museum curators have been very helpful in permitting study of their collections and photographing and borrowing specimens. These include Dr. P. H. Arnaud (CA); M. D. Bowers and J. Weintraub (MZ); Dr. J. F. Clarke and Dr. R. Robbins (SI); J. P. Donahue (LA); Dr. G. Ekis and C. Young (CM); Dr. F. H. Rindge (AM); R. I. Vane-Wright and P. Ackery (BM); Dr. A. M. Young and S. S. Borkin (MM); Dr. G. Lamas (UN); and Dr. J. Cândido de Mello Carvalho (UP).

I am indebted to Dr. Olaf Mielke and Dr. Keith S. Brown, Jr. for help in field observations in Brazil and study of collections in their care, and to Javier and Roberto de la Maza for help in field studies in Mexico. Also I am indebted to Alberto Díaz Francés, Frank R. Hedges and Gordon B. Small for use of photographs and specimens.

I wish to thank my wife Joanne F. Jenkins for help in field collecting in many tropical countries and for providing excellent secretarial and artistic assistance.

Genus *Myscelia* Doubleday, 1844

Myscelia Doubleday, 1844. List. Spec. Lepid. Ins. British Mus. 1:88. Type-species by selection by Barnes & Benjamin, 1926, Bull. S. Cal. Acad. Sci. 25:15:*Papilio orsis* Drury, [1782], Ill. Nat. Hist. 3: index et 20, pl. 16, fig. 3.
= *Sagaritis* Hübner, [1821]. Samml. Exot. Schmett. 2:pl.[43]. Type-species by monotypy: *Sagaritis orseis* Hübner, [1821], (*orseis* Hübner is an unjustified emendation of *orsis* Drury, [1782] Ill. Nat. Hist. 3: index et 20, pl. 16, fig. 3). The name *Sagaritis* is a junior homonym of *Sagaritis* Billberg, 1820. Enum. Ins. Mus. Bilb.:134.

Myscelia hypatia Strecker, 1900

Figs. 12-15, 82, 95, 103

Myscelia hypatia Strecker, 1900. Lep. Rhop. & Het. Suppl. 3:24. TL: Labelled "Brazil, Santarem (?)." (Upper Amazon in original description.) Holotype: 1 ♂ HT from H. W. Smith in Strecker Coll., AA, labelled "Orig. Type." Also 1 ♂ from "Rio de Janeiro" with type. (Examined). (Figs. 12 & 13).

= *Myscelia cyanomelas* Röber, in Seitz (1916) Macrolep. 5:482, and pl. 98 f. ♂ illustrated. TL: "Lower Amazon (Santarem)" Syntypes: Location unknown (not in BM) [Syn. nov.]

M. hypatia is probably the most primitive species in the genus *Myscelia*. It is locally common and restricted to the lower Amazon area. The female has a wing pattern and markings almost identical with female *Catonephele nyctimus* to which it is closely related. While the male hypandrium is also closely related to *Catonephele*, the striking iridescent blue color in the male and the very angular truncate-shaped wings and sinuate margins are distinctive.

Description: Male. The forewing has an extended apex at M_1 bluntly truncate and the outer margin sinuate. The hindwing with outer margin sinuate with a projection at M_3 . DFW with basal area iridescent blue extending to inner postmedian area, but with

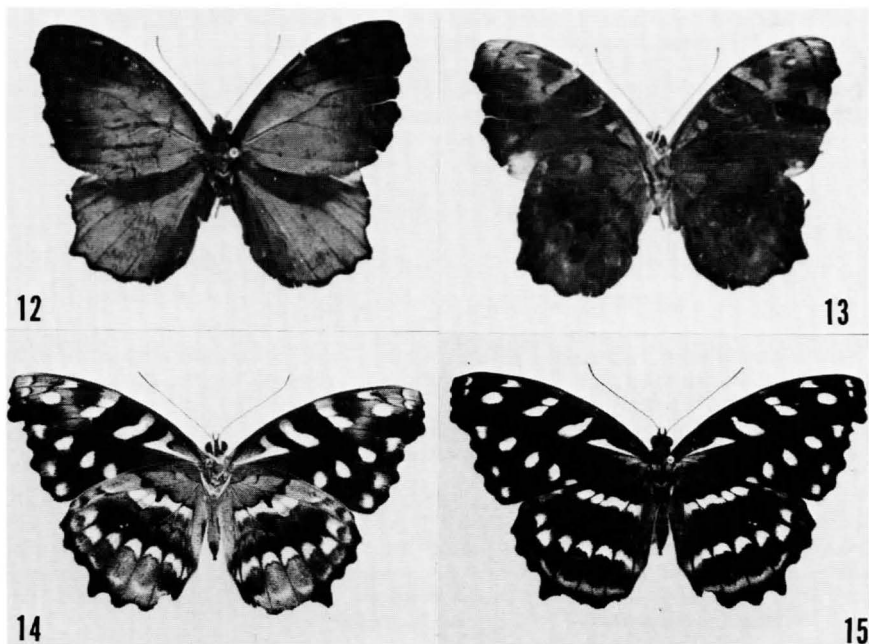
costal area to M_1 black. The only light marking is a light blue basal longitudinal stripe in the discal cell. DHW with elongate black androconium in costal area, and iridescent blue from R_s to 2A, and blackish-brown in anal area from 2A. VFW and VHW brownish with grey markings. Not as reddish or distinctly marked as in *orsis*. Male genitalia with elongate saccus, hypandrium wide at base and very narrowed posteriorly, not bent in lateral view.

Female. Very similar to *Catonephele nyctimus* ♀ and *Myscelia orsis* ♀. Wing shape similar to male but more deeply dentate margins. DFW black with a white basal longitudinal stripe in discal cell, followed by 11 white maculae as shown in fig. 14, and two small subapical spots. DHW with a submedian row and an inner postmedian row of white maculae and a submarginal line of bluish crescentic dashes. Ventral surface brownish with whitish maculae similar to dorsal surface.

Average wing length ♂ (27-28)27.3 mm, ♀ (28-29)28.3 mm.

Distribution: *M. hypatia* is presently known only from the lower Amazon River basin from Tefé to Imperatriz. The locality record from Rio de Janeiro is almost certainly an error.

Taxonomy and Variation: This species is known presently from only six localities, but it can be locally common. Examination of 25 available specimens showed no significant variation. The ♂ holotype of *M. hypatia* was examined in the Strecker collection. It is identical with specimens of *M. cyanomelas* in the BM and with the illustration of a male by Röber, in Seitz (1916). The female is closely related to *M. orsis* except for the red distal subapical angle of *M. orsis* which is distinct from the black area in *M. hypatia*.



Figures 12-15. *Myscelia hypatia* Strecker. ♂ dorsal (12) ventral (13) surfaces. BRAZIL, Rio de Janeiro, Rio de Janeiro (ST) (Probably error). ♀ dorsal (15) ventral (14) surfaces. BRAZIL, Pará, Santarem (BM).

Biology: Little is known of the biology except that it has been collected in April, September and November, and only at low altitudes along the lower Amazon River and tributaries.

The immature stages and food plants are unknown.

Specimens Examined: 19 ♂ 6 ♀

BRAZIL: *Pará*, Santaerm 5 ♂ 2 ♀ BM, 1 ♂ ST, 1 ♂ 1 ♀ Apr. CM, 1 ♀ MN; Itaituba 1 ♂ MN, "common in Sept." (Brown, pers. comm.); Monte Cristo 2 ♀ Apr. MN; *Amazonas*, Rio Preto, 78 km W of Manaus 2 ♂ Nov. AA; Tefé 3 ♂ MN; *Maranhão*, Imperatriz, Açailândia 6 ♂ UP; "Rio de Janeiro" 1 ♂ ST. (Locality record doubtful, probably an error).

Myscelia orsis (Drury, 1782)

Figs. 16-19, 83, 96, 103

Papilio orsis Drury, 1782. Illus. Nat. Hist. 3:20-21, t. 16, f. 3. TL: Brazil. Type: ♂ Probably in Australia.

=*Papilio oisis* Fabricius, 1793. Ent. Syst. 3(1): 124 ♂ n. 378. TL: "In Indies." Syntypes: ♂ unknown.

=*Papilio blandina* Fabricius, 1793. Ent. Syst. 3(1):129 ♀ n. 397. TL: "In Indies." Type: ♀ Probably in Australia (Is Junior Homonym, Cramer, 1782, and Fabricius, 1787).

=*Sagaritis orseis* Hübner, [1821]. Samml. Exot. Schmett. 2: tab. [43], pl. 256, f. 1-4. TL: Brazil. Syntypes: ♂ & ♀ probably lost.

=*Myscelia orsis* var. *azur* ♀. Label does not show author or date. TL: Brazil. Type: 1 ♀ SI. J. C. Hopfinger Coll. (Examined) [*Nomen nudum*]

Description: Male. Wings shaped as in *M. hypatia* but DFW more pointed and extended at M₁. Blue iridescence covers entire wing except in M₁ apical area. There is a variable amount of light blue maculation, which may be nearly absent or with well marked light blue spots in a pattern similar to *M. milloi*. DHW with androconium and blue similar to *M. hypatia*. The ventral surface is similar to *M. hypatia* but more reddish and more definitely marked. Male genitalia with elongate gnathos arm (1.2 mm). Hypandrium basally expanded, rami pointed inwardly with 5-7 spines.

Female. Similar to *M. hypatia* but extended apical area of DFW from R₄ to M₂ distinctly reddish.

Average wing length ♂ (24-27) 26 mm, ♀ (27-29) 27.5 mm.

Distribution: *M. orsis* is found in southeastern South America in Brazil from Paraíba to Santa Catarina, and in Entre Rios, Argentina and Paraguay. Disjunct records include Chanchamayo, Perú which may be a relict or error in labeling, and seven specimens from Colombia (Lehrmann Coll., BM) and from Honduras 2 ♀ BM and CM, which are very doubtful. These should not be accepted until they are verified by recent collecting.

Taxonomy and Variation: This species is rather common and was collected and described over 200 years ago with several names. The male was described as *orsis*, *oisis* and *orseis* and the dimorphic female as *blandina*. These were synonymized by Godart [1824] and Kirby (1871) and others. There is a ♀ specimen in the SI labeled "*Myscelia orsis* var. *azur*". There is no information on the author or date of publication and it is considered to be a *nomen nudum*. It is typical *M. orsis*.

There is much variation in size and the amount of light blue markings on the DFW and DHW. In some specimens there is very little marking on the DFW and in others there are almost whitish spots and a basal longitudinal stripe in the discal cell. On the DHW there may be no markings while some have a small basal and a medial row of light

blue markings. Examination of large series from the same locality and date shows that there is no geographic or taxonomic significance in size or coloring. There is some variation in the intensity of coloring and pattern in the females especially the VHW. Male genitalia and hypandria from throughout the range of the species showed no differences.

Biology: *M. orsis* is a common species and is frequently seen since it is bright blue. According to Röber, in Seitz (1916), the adults occur in forests, on wet roads, on bushes and in small clearings. They rest on the ends of branches on leaves, and the females flutter from one leaf to another resting on each for only a few seconds. When chased they fly into the interior of bushes. I have collected females at banana bait traps. Brown (*pers. comm.*) states it occurs in open or disturbed rain forest with sunny patches and adapts to "forest gardens."

The adults fly every month of the year without any apparent peak in population. The sex ratio is 265 ♂ to 240 ♀ in collections. d'Almeida (1922) states that it is 200 ♂ to 90 ♀.

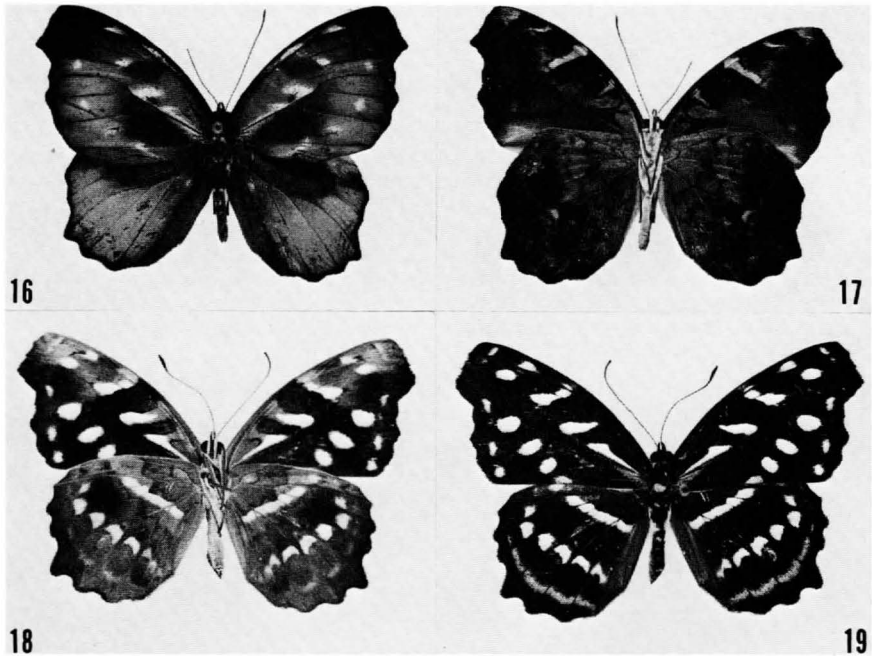
They have been collected at elevations from sea level to 1200 m. elevation.

Immature Stages: The egg all five larval stages and the pupa of *M. orsis* have been described by Müller (1886) and by d'Almeida (1922).

Food Plants:

Dalechampia triphylla Lam. Euphorbiaceae
Brazil

Müller (1886)



Figures 16-19. *Myscelia orsis* (Drury). ♂ dorsal (16) ventral (17) surfaces. BRAZIL, Espírito Santo, Linhares (AA). ♀ dorsal (18) ventral (19) surfaces. BRAZIL, Espírito Santo, Linhares (AA).

<i>Dalechampia</i> sp.	Euphorbiaceae	
Brazil		d'Almeida (1922)
<i>Dalechampia triphylla</i> Lam.	Euphorbiaceae	
Brazil		Costa Lima (1936)

Specimens Examined: 265 ♂ 240 ♀

HONDURAS: *Cortés*, San Pedro Sula; "Honduras" (error?); COLOMBIA: *Cauca*, Popoyán (error?); PERÚ: *Junín*, Chanchamayo (error?); BRAZIL: *Paraíba*, João Pessoa; *Pernambuco*, Usina Tiúma; Recife; Tapera; Ipojuca; Brejãs; *Bahia*, Salvador; Cachimbo; Ubatã; Nova Conquista; Itabela; Itamarajú; Itanhém; Lajedão; Posto do Mato; Rio Mucuri; Pedro Canario; *Espírito Santo*, Linhares; Baixo Guandú; Muniz Freire; *Minas Gerais*; Nova Lima; São Jacinto Valle; Caraça; Sete Lagoas; *Paraná*, Tibaji 800 m; Castro; Rolândia; North Paraná; Iguacu; *São Paulo*, Araras; Bauru; Ipiranga; Guarajú; Santos; São Paulo; Areiápolis; Piedade; Itaicí; *Rio de Janeiro*, Itatiaia; Rio de Janeiro; Teresópolis; Petrópolis; Corcovado; Tijuca; Santo Antônio dos Brotos; Lago de Sacuarema; Mendes; Gávea; *Santa Catarina*; Maçaranduba; Brusque; Pinhal; Joinville; Santa Catherine; Rio Hercília; ARGENTINA: *Entre Rios*; *Misiones*; PARAGUAY: *Neembucú*, Neembucú; *Guairá*, Villarica.

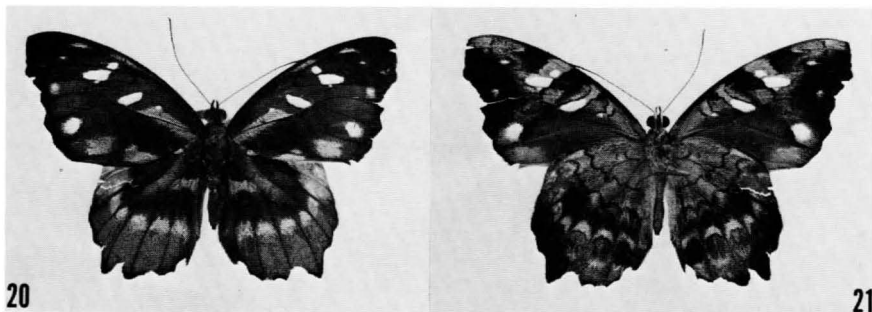
Myscelia milloi Oberthür, 1916

Figs. 20-21, 84, 103

Myscelia milloi Oberthür, 1916. Et. Lepid. Comp. 12: p. 38, pl. 406, f. 3489. TL: French Guiana (Interior). Holotype: BM 15-137, 1 ♂ HT, Coll. C. Bar., Ex. Oberthür Coll. BM 1927-3 (Examined). (Figs. 20, 21).

Description: Male. Forewing with an extended apex at M₁, bluntly truncate, outer margin strongly sinuate. Hindwing with outer margin sinuate with a projection at M₃. DFW bluish black with a basal longitudinal stripe of light blue in discal cell, and a square bluish macula in submedian area in Cu₂-2A, two white maculae in inner postmedian area and two white and one smaller dusky maculae in outer postmedian area, and two small bluish maculae in subapical area. DHW with androconial patch, a short blue submedian band from Cu₂ to 2A, and an inner postmedian cross band of separate pale blue semicircular maculae. VFW similar to DFW but bluish-basal longitudinal stripe and bluish macula in Cu₂-2A is represented by dusky grey areas, a row of light lunate maculae in inner postmedian area. Male genitalia with gnathos arm shorter 0.9 mm. than in *orsis* (1.2 mm), hypandrium bulbous in middle, rami with many setae.

Wing length of holotype ♂ 27 mm.



Figures 20-21. *Myscelia milloi* Oberthür. ♂ dorsal (20) ventral (21) surfaces. French Guiana ("interior"). Holotype, *Myscelia milloi* Oberthür (BM).

Distribution: Known only from the holotype ♂ specimen collected in the "interior" of French Guiana.

Taxonomy and Variation: The single specimen is distinct in wing pattern and male genitalia and is considered to be a valid species at present, but more specimens and data are greatly needed. The species is most interesting because the male wing pattern approaches the wing pattern of the females of *M. hypatia* and *M. orsis* which are closely related to female *Catonephele nyctimus*. It is also of interest since it appears to be a link to *M. cyaniris* and *M. leucocyana*, which are probably the progenitors of the Central American *Myscelia*. There is of course the possibility that the *M. milloi* specimen is an aberration, but if so, it is extremely interesting from the phylogenetic aspect. The species was dedicated by Oberthür to Madame Juliette Millo-Culot, the artist who painted the specimen accurately.

Biology: Nothing is known about the biology of this species.

Specimens Examined: 1 ♂ HT.
FRENCH GUIANA: "Interior" 1 ♂ BM.

Myscelia capenas (Hewitson) 1857

M. capenas is an unusual species which is limited in distribution to the upper Amazon drainage region. It is relatively uncommon, only 82 ♂ and 19 ♀ have been identified.

As mentioned previously this anomalous species may not belong in the genus *Myscelia*. It appears to be a separate taxon between *Catonephele*, *Nessaea*, *Cybdelis* and *Myscelia* and may even need to be put in a separate genus. This will be studied later. The syntypes of *M. capenas* were studied in the BM and "type ♂" is shown in figs. 22 & 23. The DFW white postmedian band is indented in the middle but is not divided as in ssp. *octomaculata*. There are three basal light blue maculae and sometimes an additional small spot. The DHW may have a broad rufous median band or this may be indistinct or absent.

Description: Male. Forewing with an extended apex bluntly truncate, the outer margin strongly sinuate, hindwing with a projection at M_3 . DFW black with a bluish subapical elongate marking; a white inner postmedian band indented at the middle on both sides; three bluish maculae in the basal half and sometimes an additional small spot. DHW with dark brown color or a broad rufous band in submedian to median area. Inner postmedian dark ocelli present and an outer postmedian wavy line. Lower side mostly brownish with white band on VFW and VHW with two prominent inner postmedian ocelli. Male genitalia with relatively short valvae; hypandrium with base enlarged followed by a narrow median constriction.

Female: Similar to male except DFW has lighter brown base color and broader less indented white inner postmedian cross band and no bluish maculae in basal half. DHW with four prominent inner postmedian ocelli and a postmedian dark wavy band. Under-side similar to male.

Key to Subspecies of *M. capenas*

Males.

- 1a. DFW with four large light blue or blue-white maculae in basal half of wing, including a large spot in Cu_1-Cu_2 ; DHW with an inner postmedian row of four (rarely 2 or 3) large black ocelli *octomaculata*
- 1b. DFW with three large light blue maculae in basal half of wing, (a small blue spot present in Cu_1-Cu_2 in intergrades); DHW with one (rarely two) small postmedian black ocelli *capenas*

Females.

- 1a. DFW with two large distinct white inner postmedian white maculae and two small white outer postmedian maculae *octomaculata*
 1b. DFW with a large white inner postmedian band, and one small white outer postmedian spot *capenas*

***Myscelia capenas capenas* (Hewitson), 1857 [Stat. rev.]**

Figs. 22-25, 97, 104

Cybdelis capenas Hewitson, 1857. Exot. Butt. Nymphalidae 2: *Cybdelis* 3, [p. 45, pl. 23], fig. 16, 17. TL: "Amazon". Syntypes: BM 15-140, Rh. 9335. 1 ♂ (Examined) (Figs. 22 & 23).

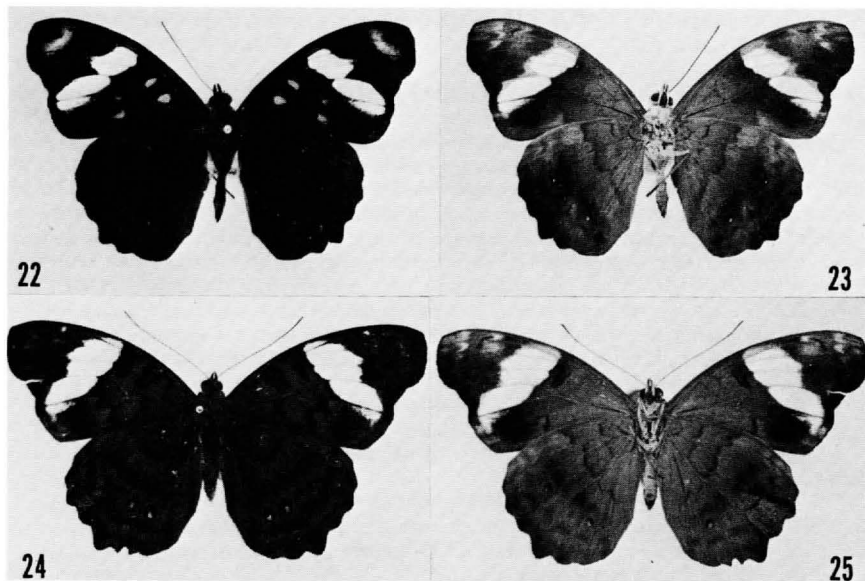
=*Myscelia capenas* forma *madeira* Röber, in Seitz (1916). Macrolep. 5: 483. TL: Brazil, Amazonas, Humaitá, Rio Madeira. (Jun-Sep.) Holotype: USNM—"Peru," 1 ♂ "HT" (Examined) [Syn. nov.]

=*Myscelia capenas* forma *obscura* Röber 1928. Int. Ent. Zeit. 22:68, fig. 2. TL: Colombia [Putumayo], Mocoa. Holotype: 1 ♂ HT in BM (Coll. Niepelt, Joicey Coll.) (Examined) [Syn. nov.]

Description: As in *M. capenas* except for differences for *M. c. capenas* listed in the key to subspecies. Average wing length ♂ (27-29)28, ♀ (27-30)29 mm.

Distribution: From Colombia and Venezuela and the upper Amazon region in Brazil. There is some intergradation with *octomaculata* in western Colombia and eastern Perú.

Taxonomy and Variation: The syntype male "type" in the BM was examined and com-



Figures 22-25. *Myscelia capenas capenas* Hewitson. ♂ dorsal (22) ventral (23) surfaces. "Amazon," Syntype, *Cybdelis capenas* Hewitson (BM). ♀ dorsal (24) ventral (25) surfaces. BRAZIL, Amazonas, Tefé (BM).

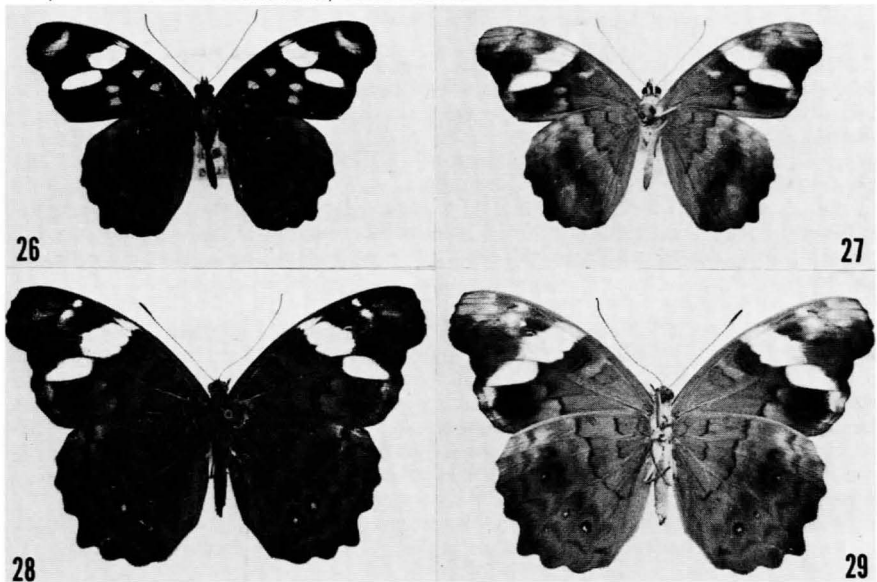
pared with other *capenas*, and it is typical of those studied. There is considerable variation particularly in the presence or absence of a rufous median to submedian band on the DHW.

Forma *madeira* Röber, in Seitz (1916), "has no brown band on the hindwings, and above the blue inner marginal spot of the forewings, there is one more such spot, the under surface being also darker." This fits the type and other typical *capenas*. The holotype of forma *madeira* was studied at the SI and it is a synonym. *M. capenas obscura* Röber (1928) is said to be darker above, especially on the hindwings, and the DFW median white band is larger and united into a band; and the black markings beneath are sharper. I have examined the male HT in the BM, and it is nearly typical *capenas* and is a synonym. The type locality Mocoa, Colombia appears to be in an intergrade area with *octomaculata*. There is intergradation in eastern Perú at Shintuya, Madre de Diós and at Rio Colorado, Cuzco.

Biology: The adults occur in partly forested area. According to Brown (pers. comm.) they come to baits of fermented banana or human excrement. They occur on leaves and their wings are opened when startled. They have been collected at lower altitudes during July and August (June-September in Röber, in Seitz (1916). Intergrades were collected from 460 to 800 m in March and July. It is presently considered to be relatively rare. Nothing is known of the larvae or host plants.

Specimens Examined: 23 ♂ 8 ♀

COLOMBIA: *Amazonas*, La Pedrera, Rio Caquetá 1 ♂; PERÚ: *Loreto*, Caballocoche 2 ♂ 1 ♀ X; *Cuzco*, Rio Colorado X 1 ♂ 1 ♀ AA; *Madre de Diós*, Shintuya X 1 ♂ July AA; BRAZIL: *Amazonas*, São Paulo de Olivença 3 ♂; Tefé 4 ♂ 2 ♀ BM, 1 ♂ ST; Rio Uaupés 1 ♂ AM; "Upper Amazonas" 1 ♂, Tonantins 1 ♂ Aug. CM; Manacapuru 1 ♂ July, CM; Benjamin Constant 1 ♂ 1 ♀; São Felipe (Eirunepé) 1 ♂ BM; Humaitá, Rio Madeira 1 ♂; *Rondônia*, Jarú 1 ♀ Aug. AA; *Mato Grosso*, Salto de Céu a Rio Vermelho; Fazenda Araputanga ("Jan., not rare" Brown (pers. comm.); *Acre*, Alto Jurua 1 ♂ 2 ♀ MN; VENEZUELA: *Amazonas*, Salto Ténquia 1 ♂ KB.



Figures 26-29. *Myscelia capenas octomaculata* (Butler). ♂ dorsal (26) ventral (27) surfaces. PERÚ, *Loreto*, Nautá. Holotype, *Eunica octomaculata* Butler (BM). ♀ dorsal (28) ventral (29) surfaces. PERÚ, *San Martín*, Tarapoto (BM).

***Myscelia capenas octomaculata* (Butler), 1873 [Stat. rev.]**

Figs. 26-29, 85, 97, 104

Eunica octomaculata Butler, 1873. Cist. Ent. 1:160. TL: Peru; "Amazons, Nauta." (Degand). Holotype: 1 ♂ HT, BM Type 15-140, Rh. 9334. (Examined). (Figs. 26 & 27).

Description: As in *M. capenas* except for differences for *M. capenas octomaculata* listed in the key to subspecies. Average wing length ♂ (25-27)26 mm, ♀ (29-31) 30 mm.

Distribution: From southern Colombia and Perú to Bolivia. Intergrades with *M. c. capenas* have been collected in western Colombia and eastern Perú.

Taxonomy and Variation: The DFW postmedian band is divided into two distinct white maculae, and there are four basal bluish maculae. The DHW appears to have a rufous band more frequently than *M. c. capenas*, but at Tingo María, Perú I have collected a series with a rufous median band present, partly present, or absent.

Biology: Adults are found in lightly forested area. They occur from lower altitudes to about 1,000 m in elevation. They have been collected from January to August.

There are no data known on the larvae or host plants.

Specimens Examined: 59 ♂ 11 ♀

COLOMBIA: *Amazonas*, Florida; *Putumayo*, Umbría; Mocoa; ECUADOR: *Inambura*, San Antonio; PERÚ: *Loreto*, Iquitos; Rio Ucayali; Contamana; Nauta TL; *San Martín*, Upper Rio Huallaga; Tarapoto; Juanjui; *Huanúco*, Tingo María; Jepelacio; *Junín*, Pampa Hermosa; Satipo; San Luis de Shuaro; Chanchamayo; La Merced; *Puno*, La Unión; Carabaya; Rio Huacamayo; *Ayacucho*, Rio Piene; *Cuzco*, Rio Tono; *Madre de Diós*, Boca Rio la Torre; BOLIVIA: *Beni*, Reyes.

***Myscelia cyaniris* Doubleday [1848]**

M. cyaniris is thought to have originated from *M. milloi* and its relatives *M. orsis* and *M. hypatia*. It is the only other *Myscelia* with an androconium and a slight convexity in the posterior edge of the DFW in the male. It occurs from Guyana to northern Perú to Mexico in four well marked subspecies. It is fairly common in Central America and Mexico. *M. cyaniris* or its earlier progenitor is also thought to be the origin of *leucocyana*, *aracynthia*, *cyananthe*, *pattenia*, and *ethusa*. The basal white longitudinal streak in the discal cell of the DFW (except in ♀ *leucocyana*) and the bright blue color are distinctive. The hypandrium of the male shows some widening of the posterior area, but the rami are not extended. There is a reduction series from ssp. *albescens* to *alvaradia* in the white maculae, and there is an increase of blue brilliance to *alvaradia*.

Description: Male. DFW with marked extended apex at M₁, pointedly truncate, the outer margin concave below; a long basal white longitudinal stripe extending the length of the discal cell; a submedian white macula in Cu₁-Cu₂ and inner and outer postmedian rows of white maculae. DHW with a submedian band, inner and outer postmedian bands and a submarginal stripe. Ventral surface with variable markings not well defined but often reflecting maculation of dorsal surface. The VHW has two to five black spots in the inner postmedian row. The male genitalia has a short saccus and the hypandrium is somewhat enlarged posteriorly; the rami are not extended.

Female. Similar to male but somewhat larger and lacking the androconium and bright blue of the male. Base color black to dark brownish. Ventral surface often more heavily mottled than male.

Key to Subspecies of *Myscelia cyaniris*

Males.

- 1a. DFW inner postmedian band with macula in Cu_2-2A absent or a small blue spot; macula in Cu_1-Cu_2 absent; two outer postmedian small spots in M_1-M_2 near subapex absent (Western Mexico) *alvaradia*
- 1b. DFW inner postmedian band with white or large pale blue macula in Cu_2-2A , white macula in Cu_1-Cu_2 ; two outer postmedian small white maculae in M_1-M_2 near subapex 2
- 2a. DHW with outer postmedian band white; DFW inner postmedian band with large white rectangular patch in Cu_2-2A (N. South America) *albescens*
- 2b. DHW with outer postmedian band blue; DFW inner postmedian band with small white or blue macula in Cu_2-2A 3
- 3a. DFW with interno-basal longitudinal stripe with distal triangular white patch; inner postmedian macula in Cu_2-2A white; VFW with small submedian and larger inner postmedian white maculae present posterior to Cu_2 ; DHW distal segments of submedian and inner postmedian bands narrower with white. (Perú and Ecuador to Panamá) *millerorum*
- 3b. DFW with interno-basal longitudinal stripe with distal tip light blue (rarely white); inner postmedian macula in Cu_2-2A pale blue, VFW usually with no white maculae posterior to Cu_2 ; DHW distal segments of submedian and inner postmedian bands broader with pale blue (Panamá to Mexico) *cyaniris*

Females.

- 1a. DHW with outer postmedian band white *albescens*
- 1b. DHW with outer postmedian band blue 2
- 2a. DFW and DHW inner postmedian band with large white macula in Cu_2-2A *millerorum*
- 2b. DFW and DHW inner postmedian band with blue or bluish purple patch in Cu_2-2A 3
- 3a. DFW outer postmedian row with macula in R_3-R_4 and R_5-M_1 separate, not connected by small white macula in fork of R_4-R_5 *alvaradia*
- 3b. DFW outer postmedian row with macula in R_3-R_4 and R_5-M_1 connected by small white macula in fork of R_4-R_5 *cyaniris*

Myscelia cyaniris cyaniris Doubleday [1848] [Stat. rev.]

Figs. 30-33, 86, 98, 105

Myscelia cyaniris Doubleday [1848]. Gen. Diurn. Lep. t. 27, f. 2 [1848]; p. 222 in [1849], TL: Honduras. Syntypes: BM 15-138, Rh. 9289 1 ♀. This should be Rh. 9288 (as listed by Gabriel, 1927) since the type of *M. leucocyana* is also Rh. 9289 (Examined) Figs. 32 & 33).

=*Cybdelis cyaniris* D. D. Boisduval, 1870. Lep. Guat. p. 40.

Description: As in *M. cyaniris* except for differences listed in the key to subspecies for *M. c. cyaniris*. Average wing length ♂ (27-35)32 mm, ♀ (32-36)33 mm.

Distribution: This relatively common subspecies is distributed from the eastern coast of Mexico from Tamaulipas to Panamá where it intergrades with *M. cyaniris millerorum*.

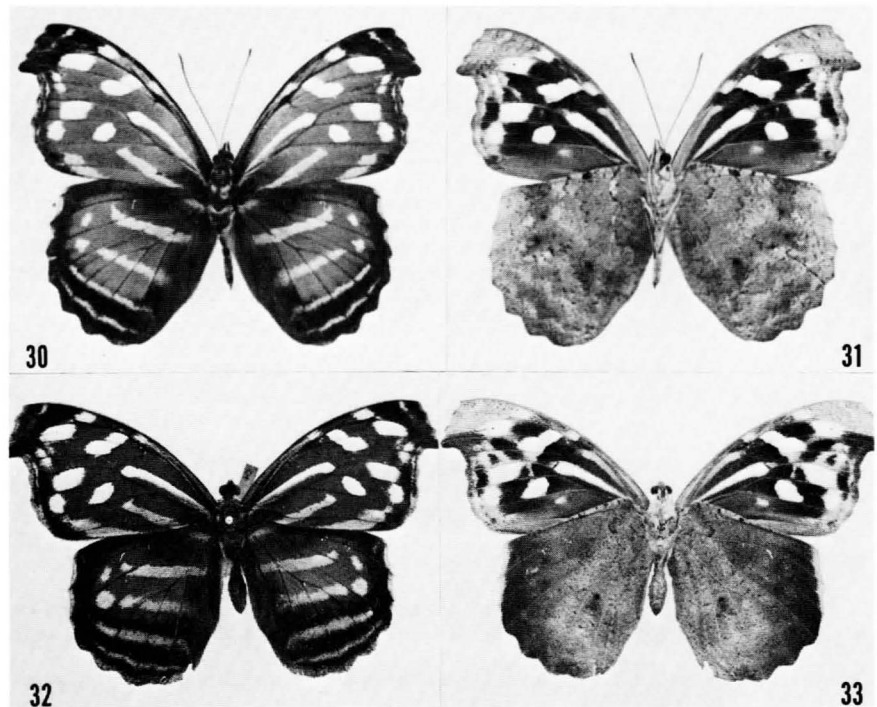
Taxonomy and Variation: *M. cyaniris* was described in 1848. The "type" ♀ in the BM

was examined, and it is typical of the population from Mexico to Costa Rica. There is some variation in the wing pattern. The DFW interno-basal longitudinal stripe may be all pale blue, or pale blue with a whitish tip, or nearly missing with a slight remnant at the base or tip of the stripe. The DHW submedian band may be thick or narrow. There is some variation in size (δ 27-35 mm).

Biology: This subspecies is found in forested river valleys in forest openings and in forest roads and nearby open areas, including cut over areas and dense scrub. I have also collected it in a river valley with a small sugar cane press, in company with *M. ethusa*. The adults are fairly fast fliers and are readily observed with the bright blue coloration. It has been collected more commonly from sea level to several hundred meters, but also up to nearly 1000 m. The adults occur during every month of the year but appear to be more common during the wet season.

Specimens Examined: 142 δ 74 φ

MEXICO: *Tamaulipas*, Gómez Farfás; *Veracruz*, Tampico; Poza Rica; Santa Rosa; Paso San Juan; Presidio; Tierra Blanca; Ojo de Agua; Catemaco; Minatitlán; Chinameca; Fortín de las Flores; Jalapa; Nautla; Dos Amates; Teocelo; Mundo Nuevo; Orizaba; Tezonapa; Jesús Carranza; Córdoba; Rio Cazones; Misantla; Zongolica; Motzorongo; Los Tuxtlas; Coatepec; *San Luis Potosí*, Xilitla 800 m; El Salto; Tamazunchale; El Pujal; Quinta Chilla; Valles; Picalco; Huichihuayán; Matlapa; Palitla; *Puebla*, Apapantilla nr. Juárez; *Oaxaca*, Matías Romero; Rio Escondido; Ayutla; Tuxtepec; Ojitlán; Chiltepec; Rancho San Carlos; El Naranjal; *Morelos*, Tequesquetengo; *Tabasco*,



Figures 30-33. *Myscelia cyaniris cyaniris* Doubleday. δ dorsal (30) ventral (31) surfaces. COSTA RICA, Cartago, Turrialba (AA). φ dorsal (32) ventral (33) surfaces. "HONDURAS" Syntype *Myscelia cyaniris* Doubleday (BM).

Cárdenas; Chiapas, Maria Madre; Tres Islas; Cintalapa; San Jerónimo; Chajul; Mapastepec; Palenque; Cuahtémoc; San Quintín; El Porvenir; Ocozocuatla; Malpaso; Yucatán, Pisté; Quintana Roo, X Can, BELIZE: Corozal, Corozal; GUATEMALA: N. Verapaz; Quetzaltenango, Coatepeque; El Petén, Sayaxché; Suchitepéquez, Variedades; Escuintla, Escuintla; EL SALVADOR: Ahuachapán, Ahuachapán; NICARAGUA: Managua, Managua; HONDURAS: Cortés, San Pedro Sula; COSTA RICA: Limón, Guápiles; Puerto Limón, Tortuguero; Cartago, Turrialba; Juan Viñas; Puntarenas, Puntarenas; Río Terraba; Heredia, Puerto Viejo; PANAMÁ: Canal Zone, Fort Sherman; Summit; Gatún; Madden Dam; Ft. Kobbe; Farfan; Lion Hill; Chiriquí, Chiriquí; La Galera; Bugaba; Panamá, Cerro Campana 800 m. A locality record "U.S. California" CM is obviously a wrong locality label.

Myscelia cyaniris albescens Hall, 1935

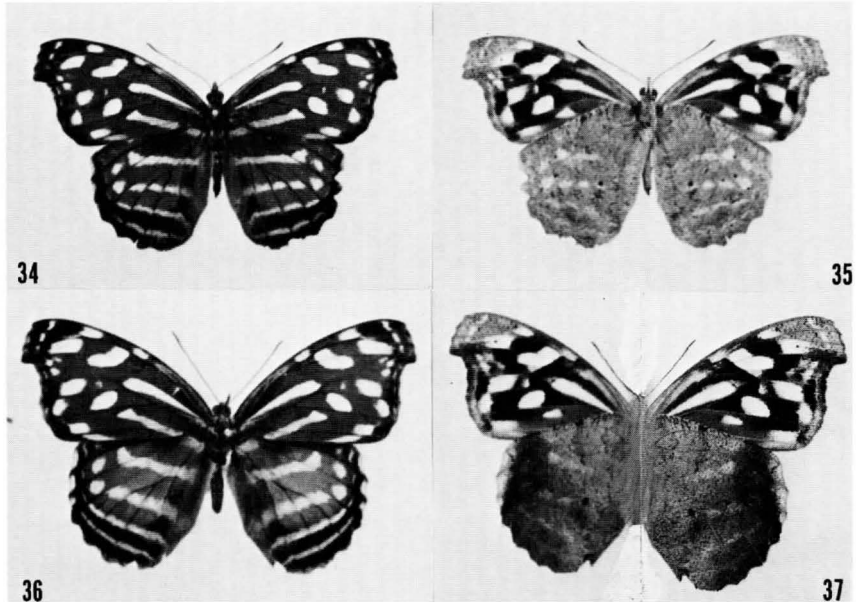
Figs. 34-37, 86, 98, 105

Myscelia cyaniris albescens Hall, 1935. Entomologist 68(869):222. TL: Venezuela, Caracas 1000 m. Syntypes: 1 ♂ 3 ♀ Hall Coll. (Sept.-Oct.) Booth Mus. Brighton.

Description: As in *M. cyaniris* except for differences for *M. cyaniris albescens* listed in the key to subspecies. Average wing length ♂ (30-32) 31 mm, ♀ (33-35) 34 mm.

Distribution: In northern South America from Guyana to Colombia.

Taxonomy and Variation: This subspecies is distinct and well marked. Due to its rarity, it is unknown how variable it is, but of the specimens examined there was only slightly significant variation. Intergrades with *M. cyaniris millerorum* have been identified



Figures 34-37. *Myscelia cyaniris albescens* Hall. ♂ dorsal (34) ventral (35) surfaces. GUYANA, Mazaruni-Potaro, Quonga (BM). ♀ dorsal (36) ventral (37) surfaces. "VENEZUELA," (BM).

from Bogotá, Colombia.

Biology: Nothing has been reported on the habitat and biology. It has been collected from 90 m to about 1000 m in elevation and in January, June, and August through October.

Specimens Examined: 5 ♂ 9 ♀

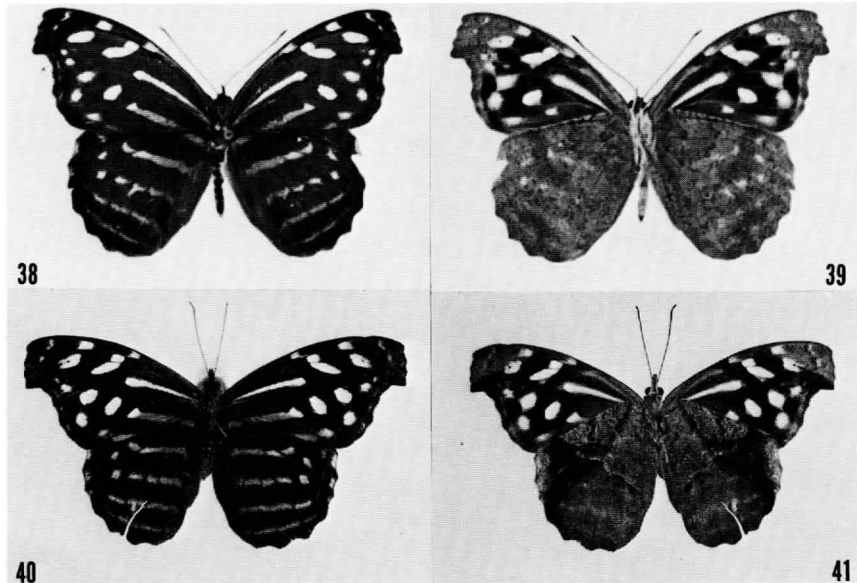
GUYANA: *Mazaruni-Potaro*, Quonga 1 ♂ BM; VENEZUELA: *Sucre*, Güiria, Patao 1 ♂ BM; *Barinas*, Cachicamos Aug. 2 ♀ UN; *Distrito Federal*, Caracas 2 ♀ Jun AA, 1 ♀ BM. No specific locality 1 ♂ 4 ♀ BM; *Amazonas*, COLOMBIA: *Atlántico*, Cuatro Bocas 1 ♂ Jan. SI; *Magdalena*, Bonda 80 m 1 ♂ Jun CM; *Cundinamarca*, "Bogotá" 2 ♀ X BM. Additional Records. VENEZUELA: *Distrito Federal*, Caracas 1 ♂ 3 ♀ Sept. Oct. (Hall, 1935).

Myscelia cyaniris millerorum [Subsp. nov.]

Figs. 38-41, 86, 98, 105

Description: Male. DFW dark blue base color with marked extended apex at M₁, pointedly truncate, the outer margin concave below; a long narrow white longitudinal stripe extending the length of discal cell, interno-basal longitudinal stripe bluish with distal triangular white patch; inner postmedian macula in Cu₂-2A small and white; VFW with small submedian and larger inner postmedian white maculae present posterior to Cu₂; DHW with cross bands thinner than in other subspecies, especially submedian and inner postmedian bands which have distal segments whitish. Male genitalia and hypandrium not significantly different from *M. c. cyaniris*. (Genitalia vial ♂ M6532, intergrades ♂ M6550 and ♀ 6531).

Female. Similar to male but base color blackish with some very dark blue; all stripes



Figures 38-41. *Myscelia cyaniris millerorum* Jenkins. ♂ dorsal (38) ventral (39) surfaces. Holotype, ECUADOR, *Pichincha*, Pichincha (JC). ♀ dorsal (40) ventral (41) surfaces, Paratype, ECUADOR, *Guayas*, Guayaquil (BM).

and cross bands very thin whitish or bluish purple. VHW more mottled than male. Average wing length ♂ (28-33)/30 mm, ♀ (29-32)/31 mm. This is somewhat smaller than other *cyaniris* subspecies.

Described from eleven ♂ and nine ♀ specimens.

HOLOTYPE ♂: ECUADOR: *Pichincha*, Pichincha, confluence of Daule and Peripa Rivers 10 Apr. 1978, coll. D. W. Jenkins (JC). **PARATYPES**: 2 ♂ same data as above (JC). ECUADOR, *El Oro*, Piedras 300 m 1 ♂ 8 Jul. 1941, Coll. F. M. Brown (AA), ECUADOR, *El Oro*, El Oro 2 ♂ 3 ♀ Jun. 1964, Coll. Lafebre, (CM); *Esmeraldas*, Tonchigue 1 ♂ 3 ♀ Mar.-May, 1964, Coll. Schirmer (MM) and Perú, *Tumbes*, La Totorá 4 ♂, 3 ♀ (UN).

Deposition of type material: Holotype ♂ and 1 paratype ♂ will be deposited in the Allyn Museum, 2 ♂ and 3 ♀ paratypes in the Carnegie Museum, 2 ♂ paratypes in the Jenkins Collection, 4 ♂ and 3 ♀ paratypes in the Museo Javier Prado, Lima, Perú, and 1 ♂ and 3 ♀ in the Milwaukee Museum.

Distribution: The known distribution is Tumbes, Perú and western Ecuador with intergrades in "Bogotá", Colombia and Panamá.

Taxonomy and Variation: This subspecies appears to be quite rare. It is presently known from only 21 specimens plus 18 intergrades. There is no significant variation in the small number of specimens studied. This is a relatively isolated population on the west coast of South America, that is apparently derived from *M. c. albescens*. The intergrades in Panamá and Costa Rica show the darker background and more white markings of *millerorum*, but are larger in size, up to 35 mm ♂ and 36 mm ♀, and have the larger white markings of *M. c. cyaniris*.

Biology: I have collected this subspecies in openings in forested river valleys and in relatively moist areas. It has been collected from sea level to 300 m elevation and from February to July.

Immature Stages: Nothing is known about the life history and food plants of this apparently rare subspecies.

Specimens Examined: 17 ♂ 13 ♀ + intergrades

PERÚ: *Tumbes*, La Totorá Feb., May, 4 ♂ 3 ♀ UN; ECUADOR: *Pichincha*, Pichincha, Confluence of Daule and Peripa Rivers 1 ♂ HT, 2 ♂ Apr. JC; *El Oro*, Piedras 300 m 1 ♂ Jul. AA; El Oro 2 ♂ 3 ♀ CM; *Guayas*, Guayaquil 2 ♂ 1 ♀ BM; *Esmeraldas*, Esmeraldas 1 ♂ BM; Tonchigue 1 ♂ 3 ♀ Mar. May, MM; *Los Rios*, Quevedo 2 ♂ 1 ♀ BM; Hacienda Ave María 1 ♂ BM; COLOMBIA: *Cundinamarca*, Bogotá 2 ♀ X (intergrade with *M. c. albescens*); PANAMÁ: *Canal Zone*, Barro Colorado Isl. X 2 ♀ Mar. AM, 1 ♀ CM; Madden Forest X 2 ♂ 1 ♀ Aug. AA; Lion Hill X 3 ♂ BM; Gatún X 2 ♀ CM; Las Cascades X 1 ♀ CM; *Colón*, Piña X 1 ♂ 2 ♀ Jul. Aug. AA; *Darién*, Cana X 1 ♂ Jun. AA. (All intergrades with *M. c. cyaniris*).

This new subspecies is named for Dr. Lee D. Miller and Jacqueline Y. Miller who have been most helpful in my studies on all of the genera of neotropical nymphalids being revised.

Myscelia cyaniris alvaradia R. de la Maza & A. Díaz Francés, 1982

Figs. 42-45, 86, 98, 105

Myscelia cyaniris alvaradia R. de la Maza & A. Díaz Francés, 1982. Rev. Soc. Mex. Lepid. 7(1):10-11. TL: Mexico, *Guerrero*, Acahuizotla 750 m. Holotype: ♂ in Museo Nac. Hist. Nat., Mexico City, also paratypes 10 ♂ 3 ♀ (Examined).

Description: As in *M. cyaniris* except for differences for *M. cyaniris alvaradia* listed in the key to subspecies. Average wing length ♂ (30-37)33 mm, ♀ (33-36)35 mm.

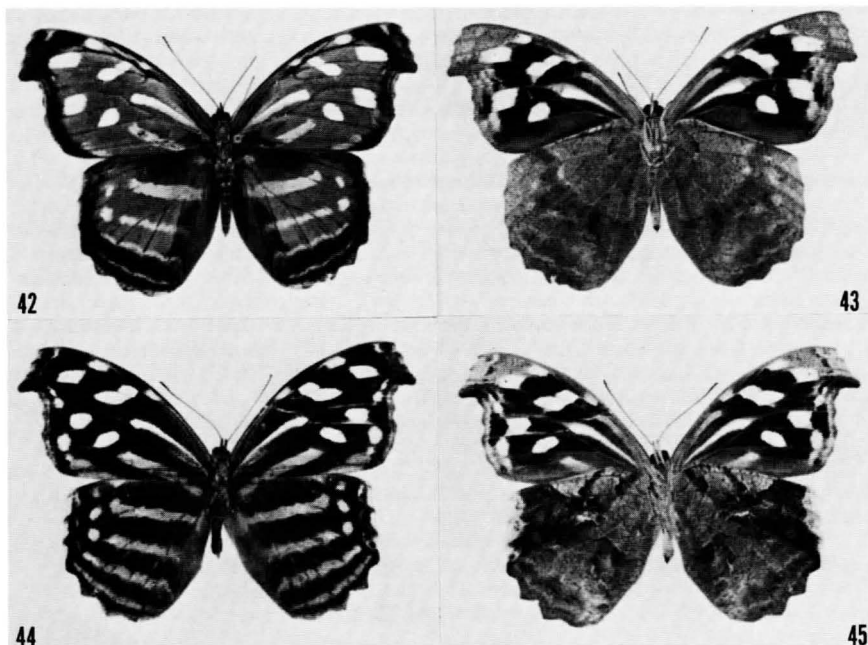
Distribution: The Pacific coast of Mexico from Minas Nuevas, Sonora south to Acahuizotla, Guerrero and Juquila, Oaxaca.

Taxonomy and Variation: This recently described subspecies is quite distinct and is the final step in the reduction of white markings in wing pattern in the *cyaniris* series extending from northern South America to western Mexico. There is little variation except in size (♂ 30-37 mm). The holotype ♂ was examined and it is typical of all of the other specimens studied. An intergrade was found at Juquila, Oaxaca which is mostly *alvaradia* but has several partial white spots on the DFW typical of *cyaniris*.

Biology: This subspecies is found in forested river valleys in western Mexico. I have collected it at Acahuizotla and Zihuatenejo, Guerrero in forests in river valleys, and at Madrid, Colima on the buttress trunks of large fig trees and on leaves and branches. They fly very rapidly and are difficult to catch since they usually fly into bushes and heavier forest. The males show their outspread bright blue wings but are readily disturbed. The females fly somewhat slower and are not so highly visible.

The adults are rather uncommon and have been collected from June to December with most found during the rainy season from July-November. They have been collected at altitudes from 750 m to 1500 m.

Immature Stages: There are no known data on the immature stages or host plants of this subspecies.



Figures 42-45. *Myscelia cyaniris alvaradia* R. de la Maza & Díaz Francés. ♂ dorsal (42) ventral (43) surfaces. MEXICO, Guerrero, Zihuatenejo (JC). ♀ dorsal (44) ventral (45) surfaces. MEXICO, Colima, Colima (JC).

Specimens Examined: 28 ♂ 20 ♀

MEXICO: *Sonora*, Minas Nuevas 1 ♂ Aug AM; *Nayarit*, Tepetilte, La Yerba 1 ♂ 3 ♀ FC; La Bajada 1 ♀ FC; *Jalisco*, Venustiano Carranza 1 ♀ FC; *Colima*, Madrid 1500 m 2 ♀ Nov. JC, 1 ♂ 3 ♀ Jan. Jun. Sep. Nov. SH; *Colima* 3 ♂ AM; *Guerrero*, Acahuizotla 750 m 3 ♂ 2 ♀ Jul. Oct. Nov. JC, 1 ♂ Oct. AA, 1 ♀ FC, 11 ♂ 3 ♀ Jul. Aug. Dec. DM; 1 ♀ Oct. MM; *Zihuatenejo* 1 ♂ Dec. AM, 1 ♂ Oct. JC; *El Faisanal* 1100 m 1 ♀ Oct. DM; No locality 5 ♂ 3 ♀ AD; *Oaxaca*, Juquila X 500 m 1 ♂ Aug. AA.

Myscelia aracynthis (Dalman, 1823)

Figs. 46-49, 87, 106

Papilio aracynthis Dalman, 1823.

Analecta Entomologica p. 41-42, no. 8. TL: Unknown. Holotype: 1 ♂ HT Stockholm. Mus. Dom. de Paykull.

=*Biblis antholia* Godart [1824]. Enc. Meth. 9. Suppl. p. 824. TL: Haiti, "Des Antilles & particulièrement de la Martinique." Syntypes: Paris, 2 specimens. [Syn. nov.]

Description: Male. Forewing greatly extended at M₁, the margin sinuate. Hindwing



Figures 46-49. *Myscelia aracynthis* Dalman. ♂ dorsal (46) ventral (47) surfaces. "N. Grenada" (Probably error) (BM). ♀ dorsal (48), ventral (49) surfaces "HAITI" (BM).

margin sinuate or scalloped. DFW bright iridescent blue with a broad interrupted diagonal band of large white maculae in the inner postmedian row and two or three white maculae in the outer postmedian row. DHW iridescent blue to about Cu_2 with black surrounding the large blue discal area. VFW dark brownish with white maculae as above and distal area mottled grey. VHW mottled brownish grey with an inner postmedian row of black spots.

Female. DFW similar to male but larger and more black in distal third with an extra white spot in Cu_1 - Cu_2 ; DHW brownish with little blue, with darker indefinite bands in the inner and outer postmedian rows and submarginal area. VFW similar to male, VHW with complex grey and black pattern similar to *ethusa* ♀.

Average wing length ♂ 35 mm ♀ 41 mm.

Distribution: *M. aracynthia* is found on the island of Hispaniola and has been collected in various localities in the Dominican Republic and Haiti. There is a ♂ specimen in the BM with a locality label "Martinique" and a ♂ in the BM with a label "N. Grenada", "Accuracy of label very doubtful." It very probably does not occur in either Martinique or Colombia.

Taxonomy and Variation: Examination of 17 specimens showed no significant variation except in size. The species has been commonly referred to as *M. antholia*, e.g. Hall (1925), Riley (1975) and Gali and Schwartz (1983). However, *M. aracynthia* was published in 1823, one year earlier than *M. antholia* by Godart [1824] which is synonymized.

M. aracynthia is most closely related to *M. cyaniris* which occurs in northern South America and Central America and is thought to have been derived from it.

Biology: In the Dominican Republic, Gali and Schwartz (1983) have studied *M. aracynthia* and state that it occurs in openings in woods, cut-over pine woods, high-canopied hardwoods, *Acacia* scrub, semi-xeric lowland forest, and open and shrubby fields. It also occurs in roads and other disturbed areas. The flight is leisurely when undisturbed, but when pursued or in open areas, it has a determined rapid flight. It rests on trees or saplings, often landing with the wings open and with the head either up or down. It remains in this position for about 15 seconds and then folds the wings over the back to become inconspicuous. The temperatures during activity ranged from 26° C to 38° C.

Specimens have been seen or collected from 19 July to 16 August. None were seen in the month of June and perhaps two were seen on 2 July. The adults were active from 0935 to 1445 hours. The authors state that in hot weather the adults may be more active in the morning and rest during the heat of the day. They were collected from sea level to 1650 m elevation but were more common at higher elevations above 305 m.

Specimens Examined: 12 ♂ 5 ♀

DOMINICAN REPUBLIC: *Monte Cristi*, Monte Cristi, 10 mi. S. of Rio Yaque del Norte 1 ♀ Jul. AM; "Mt. Cristy" 1 ♂ SI; *Santo Domingo*, Santo Domingo 2 ♂ BM; Gali & Schwartz (1983) have reported the following records: *La Vega*, 10 km SE Constanza, Cordillera Central 1650 m, Jul. (sight record); 3 km SE Constanza 1220 m. Jul. (sight record); *Pedernales*, Aceitillar, 35 km NE Cabo Rojo, Sierra de Baoruco 1220 m. Jul. (sight record); *La Estrelleta*, 10 km. S. Elias Piña, Sierra de Neiba 732 m. Jul. (sight record); *San Juan*, S. E. Sabana Alta 305 m. Jul. (sight record); *Santiago Rodríguez*, Loma Leonor, 18 km. SW Monción, Cordillera Central 550 m., Aug. 1 ♀ coll.; *Altigracia*, 1 km. N. Playa Bayajibe, sea level, Aug. 1 ♂ and 1 ♀ coll.; *Azua*, El Numero-Agua, (Marión Heredia, 1980, Naturalista Postal 19/80); HAITI: Port au Prince 4 ♂ BM; No specific locality 3 ♂ 4 ♀ BM; MARTINIQUE: No specific locality 1 ♂ BM; COLOMBIA: "N. Grenada" Hewitson Coll. 1 ♂ BM ("accuracy of label very doubtful").

Myscelia leucocyana C. & R. Felder, 1861

M. leucocyana is considered to be closely related to *M. cyaniris* and has more white maculae on the DFW than any other *Myscelia*. There is also less marked sexual dimorphism than more "advanced" species. It is found from eastern Venezuela to Nicaragua. It is relatively uncommon, only 79 specimens have been available for study. It is considered to initiate the *ethusa* line of evolution with a reduction series in the maculation. There is no androconium and the hypandrium is broader posteriorly than in *cyaniris*.

Description: Male. Forewing extended at M_1 , the margin sinuate. Hindwing margin quite sinuate. DFW black with a large number of white maculae as shown in fig. 2. Discal cell with three narrow light blue longitudinal lines and a blue basal longitudinal band extending to submedian row. DHW with broad submedian band of blue, an inner postmedian row of broad blue maculae (which may be partially split by a black line into two rows) and a postmedian broad blue row of maculae; and a submarginal row of small blue maculae. The VFW has a diffuse pattern of maculae reflecting the upper surface and the VHW is variably patterned or marbled. The male genitalia saccus is medium in length and the hypandrium is relatively broad with many large spines on the rami.

Female. Similar to male except more blackish brown, blue markings are pale with whitish; DFW discal cell has one short white longitudinal line. DHW with widely separate inner and outer postmedian rows of pale bluish purple maculae.

Key to Subspecies of *Myscelia leucocyana*

Males.

- 1a. DFW with a blue macula but without a prominent white macula in M_2 - M_3 in the inner postmedian diagonal row of white maculae, white median macula in R_1 - R_3 relatively small and at least 1 mm basad from white macula of inner postmedian row in R_5 - M_1 . DHW with inner postmedian row of blue maculae usually split into two rows. VHW without small dark postmedian marking in $Sc+R_1-R_3$, and in inner postmedian area of M_1 - M_2 . (Venezuela to Panamá)..... *leucocyana*
- 1b. DFW with a prominent white macula in M_2 - M_3 in the inner postmedian diagonal row of white maculae, white median macula in R_1 - R_3 larger and elongate, extending to white macula of inner postmedian row in R_5 - M_1 . DHW with inner postmedian row of blue maculae usually not split into two rows. VHW with very dark postmedian marking in $Sc+R_1-R_3$ and a very dark elongate marking extending from inner to outer postmedian M_1 - M_2 . (Costa Rica to Nicaragua)..... *smalli*

Females.

- 1a. DFW markings similar to male. VHW with a dark brown elongate marking in inner to outer postmedian area of M_1 - M_2 and a small amount of dark brown in M_3 -2A..... *leucocyana*
- 1b. DFW markings similar to male. VHW with a very dark irregular band in inner postmedian area with a large dark blotch ($\frac{1}{3}$ length of wing) extending from M_1 to Cu_1 *smalli*

Myscelia leucocyana leucocyana C. & R. Felder, 1861 [Stat. rev.]

Figs. 50-53, 88, 99, 106

Myscelia leucocyana C. & R. Felder, 1861. Wien. Ent. Monat. 5: 106, n. 87. TL: Venezuela, Caracas (Moritz). Syntypes: BM 15-139, Rh. 9289 "HT" 1 ♂ should be

[Rh.9288] since *M. cyaniris* is 9289. (Examined).

Myscelia leucocyanea (Feld.) Godman & Salvin. 1883: 231 (partim). [Lapsus calami].

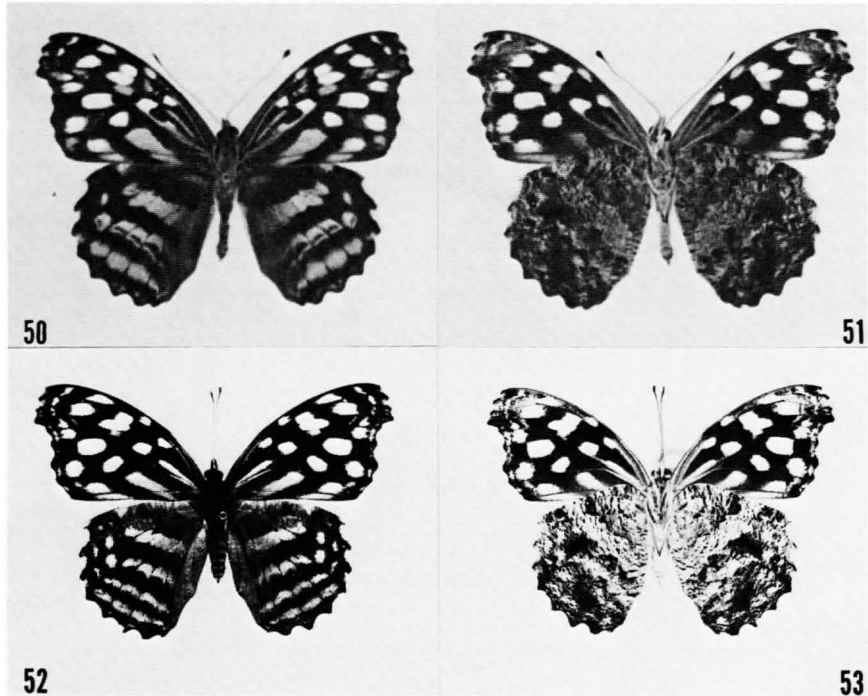
Description: As in *M. leucocyanea* except for differences for *M. l. leucocyanea* listed in the key to subspecies. Average wing length ♂ (22-30)26 mm, ♀ (29-32) 30 mm.

Distribution: The known distribution of *M. l. leucocyanea* is from Panamá through Colombia to Sucre in eastern Venezuela.

Taxonomy and Variation: *M. leucocyanea* was described in 1861 from two specimens from Caracas, Venezuela. Felder described the ♀ and illustrated it in 1867. The type in the BM marked "♂ [♀]" was examined, and it appears to be a paler ♀ than most Central American specimens. Male specimens from South America and Panamá have a blue instead of white marking on the DFW inner postmedial row in space M_2 - M_3 , which is present in all Costa Rican specimens.

Biology: The species is uncommon and relatively rare in collections. It is found in openings of tropical forest and has been collected at the margins of mud puddles. It has been found from sea level to 1,300 m elevation. Adults have been collected from April to December with perhaps a peak in June to August.

Immature Stages: Nothing has been reported concerning the immature stages and food plants.



Figures 50-53. *Myscelia leucocyanea leucocyanea* C.&R. Felder. ♂ dorsal (50) ventral (51) surfaces. PANAMÁ, Darién, Cana (JC). ♀ dorsal (52) ventral (53) surfaces. PANAMÁ, Canal Zone, Madden Forest (AA).

Specimens Examined: 27 ♂ 11 ♀

PANAMA: *Chiriquí*, Chiriquí 1 ♂ SI, 4 ♀ BM; Bugaba 4 ♂ BM; Puerto Armuella 2 ♀ Aug., Oct. AM, 2 ♂ Jun. Jul. MZ; *Veraguas*, Veraguas 2 ♂ BM; *Canal Zone*, Gamboa 2 ♂ Nov. Dec. GS; Madden Forest 1 ♂ 3 ♀ Aug. AA, 1 ♂ Aug. GS; Summit 1 ♂ 1 ♀ Jun. Aug. GS; Lion Hill 2 ♀ BM; *Darién*, Cana 400 m 2 ♂ JC; COLOMBIA: Seville Isl. 3 ♂ BM; No locality 1 ♂ SI; VENEZUELA: *Sucre*, Campo Alegre 1300 m 1 ♀ BM; Cumaná 1 ♀ BM; No locality 1 ♂ 3 ♀ BM, 1 ♂ AM; *Distrito Federal*, Caracas 1 ♂ AM; *Aragua*, La Victoria Sep. 1 ♂ UN.

Myscelia leucocyana smalli [Subsp. nov.]

Figs. 54-57, 88, 99, 106

Myscelia leucocyana (Godman & Salvin, 1883: 231) partim, nec Felder, 1861).

Description: Male. DFW extended at M_1 , the margin sinuate; black base color; discal cell with three narrow light blue longitudinal lines and a blue basal longitudinal band extending to submedian row; a prominent white macula in M_2 - M_3 in the inner postmedian diagonal row of white maculae, white median macula in R_1 - R_3 larger and elongate, extending to white macula of inner postmedian row in R_5 - M_1 . DHW with broad submedian band of blue, an inner postmedian row of broad blue maculae not usually split into



Figures 54-57. *Myscelia leucocyana smalli* Jenkins. ♂ dorsal (54) ventral (55) surfaces. Holotype COSTA RICA, *Cartago*, Turrialba (AA). ♀ dorsal (56), ventral (57) surfaces, Paratype COSTA RICA, *Cartago*, Turrialba, (AA).

two rows. VHW with very dark postmedian marking in Sc+R₁-Rs and a very dark elongate marking extending from inner to outer postmedian areas of M₁-M₂. Male genitalia and hypandrium not significantly different than in *M. l. leucocyana*.

Female. Similar to male except more blackish brown, blue markings are pale with some whitish, DFW discal cell has one short white longitudinal line; DHW with widely separate inner and outer postmedian rows of pale bluish purple maculae; VHW with a very dark irregular band in inner postmedian area with a large dark blotch (1/5 of wing) extending from M₁ to Cu₁.

Average wing length ♂ (26-30)27 mm, ♀ (29-32) 30 mm.

Described from 19 specimens, 13 ♂ and 6 ♀ (genitalia vial ♂ M6529, ♀ M6547).

HOLOTYPE: COSTA RICA: *Cartago*, Turrialba 1 ♂, 19 Nov. 1973, coll. S. Condie (AA).

PARATYPES: COSTA RICA: *Cartago*, Turrialba, 5 ♂ 4 ♀, May-Nov. (AA), 3 ♂ 1 ♀ Jul.-Aug. (MM); *Limon*, Puerto Viejo 1 ♂ Jul. (AA); 29 km. W. Tortuguero 2 ♂ 1 ♀ Aug. (LA); *Puntarenas*, Palmar Norte 1 ♂ Jun. (AA). The holotype and 11 paratypes are in the Allyn Museum, two paratypes in the Los Angeles County Museum, four paratypes in the Milwaukee Museum and one paratype in the Museo Nacional de Costa Rica.

Distribution: From Chontales, Nicaragua, to southern Costa Rica. There is some intergradation near the Panamá border at Puerto Viejo.

Taxonomy and Variation: There is little variation and the extra white maculae on the DFW are always present, but are rarely smaller in size in a few specimens.

Biology: Occurs in openings in tropical forests. It is attracted to decaying fruit and has been collected at fruit baits. It is uncommon in collections. It has been found from sea level to about 1000 m. Adults have been collected from April to November with most in July.

This new subspecies is named for Gordon B. Small, who has collected butterflies for over 25 years in Panamá. He has been very helpful in making available his knowledge and specimens for study of this important region.

Specimens Examined: 25 ♂ 16 ♀

NICARAGUA: *Rio San Juan*, Chontales 1 ♂ 4 ♀ BM; No locality 2 ♂ 1 ♀ BM; COSTA RICA: *Limón*, Tortuguero 40 m 2 ♂ 1 ♀ Aug. LA; Guápiles 1 ♂ 1 ♀ SI, 2 ♂ May BM, 1 ♂ CM; Siquirres 1 ♂ Oct. SI; Puerto Viejo 1 ♂ Jul. AA; *San José*, Pozo Azul 3 ♀ Apr. BM; *Cartago*, Turrialba 6 ♂ 5 ♀ Jun. Aug. Sep. Nov. AA, 3 ♂ 1 ♀ Jul. Aug. MM, 2 May, Jun. VK; *Heredia*, Puerto Viejo, Finca La Selva 75 m 1 ♂ May SI; *Puntarenas*, Palmar Norte 1 ♂ Jun. AA, 1 ♂ Jul. GS; Villa Neilly 1 ♂ Jul. CM; Curu 1 ♀ AM; Mariscal 1 ♀ Nov. SI.

Myscelia pattenia Butler & Druce, 1872

Figs. 58-61, 89, 100, 107

Myscelia pattenia Butler & Druce, 1872. Cist. Ent. 5:101. TL: Costa Rica, Cartago. HT: 1 ♂ BM, Rh. 9290 (Examined) (Figs. 58 & 59).

Description: Male. Forewing extended at M₁, margin sinuate; hind wing margin sinuate. DFW black with blue stripes and irregular markings, three narrow blue longitudinal stripes in the discal cell; a single white submedian macula in Cu₁-Cu₂, an inner postmedian row of about five white maculae, outer postmedian row of four white maculae and two thin white dashes in the subapical area. DHW with a broad blue submedian row, a blue inner postmedian band divided into two rows and fused together only in R₅-M₁, and an outer postmedian row. VFW blackish brown with a pattern

similar to dorsal surface; VHW mottled.

Female. Similar to male but with one blue longitudinal stripe in discal area. DHW with a submedian, inner and outer postmedian broad blue bands, and a thinner submedian blue band.

Average wing length ♂ (30-34)31 mm, ♀ (30-36)33 mm.

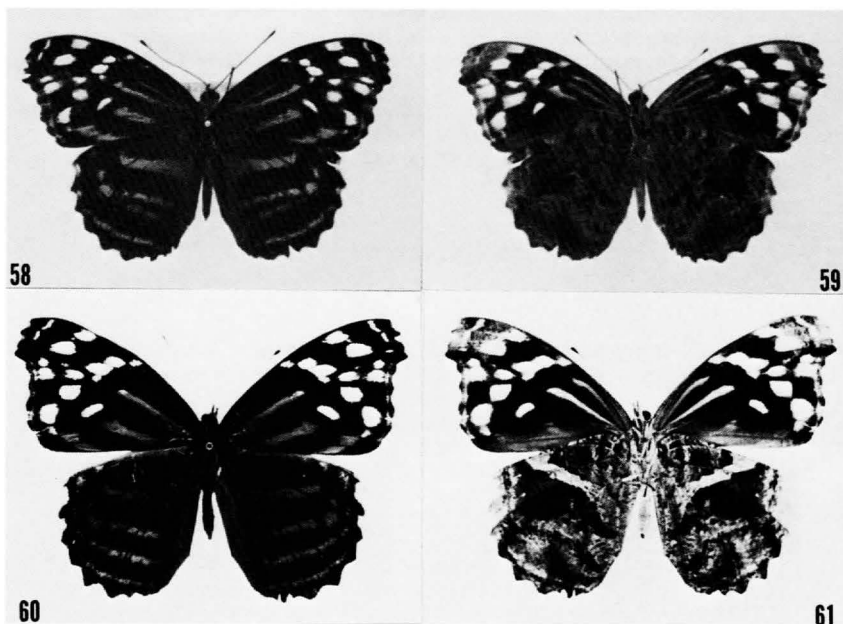
Distribution: Found from western Guatemala through Costa Rica and to western Colombia (if this record is valid).

Taxonomy and Variation: *M. pattenia* is a species with the male having the wing pattern of white maculae of the female of *M. ethusa*. It is considered to be a distinct species because of this pattern, the difference in hindwing male pattern and because the hypandrium of the male is distinct in having the rami with one or two long inner basal spines instead of four (rarely three) large spines in *ethusa*. Godman & Salvin (1901) state that they saw one male from Guatemala that was intermediate between *M. ethusa* and *M. pattenia* with regard to the color of the spots on the DFW. I observed the same in the Godman & Salvin and other collections which is typical *M. ethusa chiapensis*. The holotype ♂ in the BM is typical of specimens throughout the range.

Male genitalia of specimens from Colombia, Nicaragua and Honduras all have one or two inner basal spines on the rami of the hypandrium.

Biology: Found in forested river valleys, but nothing is recorded on the specific habitats and behavior.

The species has been collected from sea level to at least 1,200 m. The adults have been collected from January to July.



Figures 58-61. *Myscelia pattenia* Butler & Druce. ♂ dorsal (58) ventral (59) surfaces. COSTA RICA, Cartago, Holotype *Myscelia pattenia* Butler & Druce (BM). ♀ dorsal (60) ventral (61) surfaces. COSTA RICA, Guanacaste, Parque Santa Rosa (CM).

Immature Stages: Nothing is known about the immature stages and food plants.

Specimens Examined: 24 ♂ 12 ♀

GUATEMALA: *Alta Verapaz*, Chixoy Valley BM; *Baja Verapaz*, San Jeronimo 1 spec. BM; *Quetzaltenango*, Volcán de Santa María 1 ♀ BM; *Jutiapa*, Central Valleys 1 ♂ BM; *Santa Rosa*, Guazacapán 1 spec. AA; HONDURAS: *Cortés*, San Pedro Sula 7 ♂ 3 ♀ BM; NICARAGUA: *Matagalpa*, Matagalpa 2 ♂ 1 ♀ BM; No locality 1 ♂ 1 ♀ BM, 2 ♂ MZ; *Managua*, Managua 3 ♂ 2 ♀ Mar. May AM; COSTA RICA: *Guanacaste*, Parque Santa Rosa 2 ♂ 2 ♀ Jan. Jun. Jul. CM; Comelco Property 1 ♂ Feb. TA; No locality 1 ♂ Jul. 2 ♀ Jun. Jan. CM; COLOMBIA: *Magdalena*, Santa Marta 1 ♂ BM; No locality 1 ♂ AM.

Myscelia ethusa (Doyère, [1840])

This species has been confused frequently, especially the females which were formerly known as *M. rogenhoferi* due to the marked sexual dimorphism. The male of *M. pattenia* which is similar to the female of *M. ethusa* has caused additional confusion. I originally considered *pattenia* to be a subspecies of *ethusa*, but it appears to be a distinct species. *M. ethusa* extends from southern Texas to the border of Guatemala. A new subspecies is described from Chiapas, Mexico which is related to both *pattenia* and *ethusa* but has unique characters not found in either.

Description: Male. Forewing truncate, extended at M_1 , margin sinuate; hindwing margin sinuate. DFW black with blue stripes and irregular markings, three narrow blue longitudinal stripes in the discal cell. There is a white macula in the inner postmedian row, four white maculae in the outer postmedian row, and two thin dashes in the subapical area. DHW black with blue cross bands including a broad submedian row, the inner postmedian row of blue maculae with maculae from 2A to M_3 usually split by a black line, a postmarginal blue row and small blue spots in the marginal area. VFW blackish brown with maculation similar to dorsal surface, VHW dark mottled and variable.

Female. Similar to male but base color greyish black, DFW with one broad pale blue and one very thin longitudinal stripe in the discal cell, white macula similar to *pattenia* ♂ (some females with diffuse elongate white maculae [see key to subspecies]). VHW dark brown with concave lighter median band and variable complex mosaic pattern of black and brown.

Key to Subspecies of *Myscelia ethusa*

Male.

- 1a. DFW with white maculae in outer postmedian row in M_2 - M_3 diffuse and elongated, with a small white dash line proximal or connected to this macula *chiapensis*
- 1b. DFW with white maculae in outer postmedian row in M_2 - M_3 usually better defined, without dash line proximal to this macula (Male characters are not always separable)..... *ethusa*

Female.

- 1a. DFW outer postmedian white maculae in M_1 - M_2 and M_2 - M_3 diffuse and elongate extending inward to white maculae in inner postmedian band and in M_2 - M_3 may fuse the two maculae together in a long white bar. Dorsal stripes and bands usually blue..... *chiapensis*
- 1b. DFW outer postmedian white maculae in M_1 - M_2 and M_2 - M_3 not extending inwardly to join white maculae in inner postmedian band and never fusing

and joining the two maculae together in M_2 - M_3 to form a white bar.
 Dorsal stripes and bands purplish or bluish purple *ethusa*

Myscelia ethusa ethusa (Doyère, [1840]) [Stat. rev.]

Figs. 62-65, 90, 101, 107

=*Cybdelis ethusa* Boisduval, 1836, Cuvier Règne Anim. Ins. Atl. 2: pl. 138, f. 3, TL: Mexico. Syntypes: "HT" ♂ in SI (Examined) (does not conform to Art. 69, ICZN, name not valid).

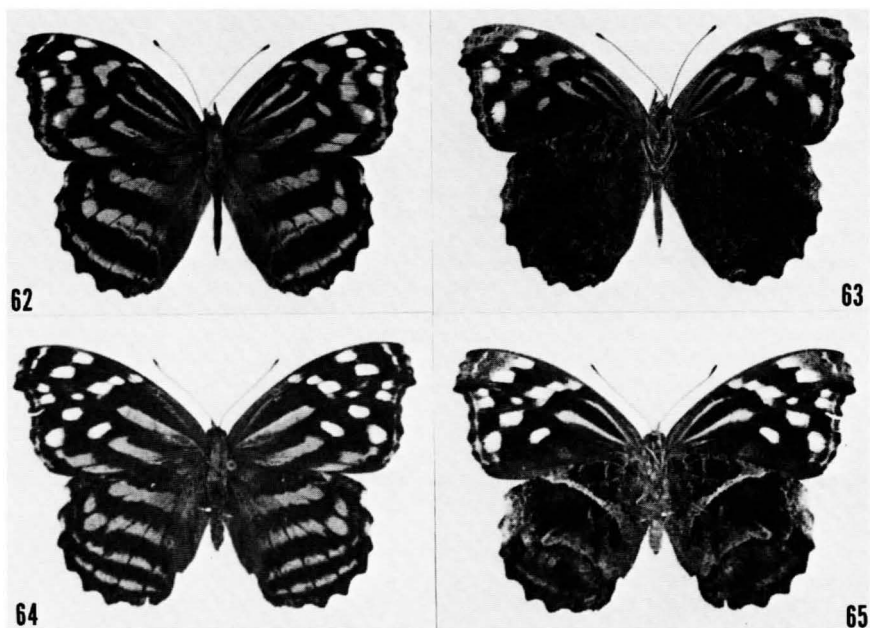
Cybdelis ethusa Doyère [1840]. Les Lepidoptères in Cuvier Règne Anim. Ed. 3, pl. 138, fig. 3 & 3b. TL: Location unknown. Syntypes: 1 ♂ SI? (Examined)

=*Faunia cyaneacula* C. & R. Felder, 1867. Reise Freg. Novara 3:408, 618, t. 53, f. 5. TL: Mexico. Type: ♂ Location unknown (not in BM).

=*Myscelia rogenhoferi* R. Felder 1869. Verh. Zool. Bot. Ges. Wien. 472. n. 22. TL: Mexico, Oaxaca Huahuapan (=Huajuapán) in Oct. Syntypes ♀♀ location unknown (Vienna?).

Description: As in *M. ethusa* except for differences for *M. e. ethusa* listed in the key to subspecies. Average wing length ♂ (29-35)31 mm, ♀ (29-37)32 mm.

Taxonomy and Variation: *Myscelia ethusa* was described in 1836 by Boisduval, but his description does not conform to Art. 69 of the ICZN so that the description by Doyère [1840] takes precedence. I have examined a ♂ specimen in the Smithsonian collection which is labeled "type" and is supposed to be the Boisduval type. It is typical of the *M. e. ethusa* population in Mexico. It is also probably the specimen used by Doyère to



Figures 62-65. *Myscelia ethusa ethusa* (Doyère). ♂ dorsal (62) ventral (63) surfaces. MEXICO, Oaxaca, Palomares (JC). ♀ dorsal (64) ventral (65) surfaces. MEXICO, Veracruz, Tampico (JC).

describe *ethusa*.

M. ethusa adults vary in the amount of purple or blue coloring. This also varies with the angle of view, direct vertical view is more blue while they become more purple viewed from the side. In males, the white spot in the inner postmedian row of the DFW in Cu-Cu₂ may be absent or present in specimens from the same place and date.

Myscelia rogenhoferi was recognized as a valid species by Godman & Salvin (1883) but they correctly synonymized it in (1901) as the female of *ethusa*. Röber, in Seitz (1916) however, stated "...known to us only from the figure, is presumably a temporal or local form of *ethusa*." Both Godman and Salvin (1883, pl. 24, fig. 3 & 4) and Röber, in Seitz (1916, pl. 99a) illustrate "*M. rogenhoferi*" which appears to be *M. ethusa chiapensis*.

M. cyanecula was described by C. & R. Felder in 1867. It was collected in Mexico by Sallé but the exact location is unknown. The figure (t. 53, fig. 5) shows a white median spot anterior to R₄, which is more typical of the population in Colima and Sinaloa. *M. cyanecula* was synonymized as the male of *M. ethusa* by Felder (1869) and by Kirby (1871), and Godman & Salvin (1883). Since the exact location of the type is unknown, it is not felt desirable to use the name "*cyanecula*" for a population in western Mexico that differs only by one white median spot. Further the presence of this spot is variable, and the distribution limits could not be clearly defined so that no subspecies is recognized.

Biology: This species is found in forested or scrubby river valleys, in dry scrubby areas, on large fig tree trunks, in banana plantations, around horse stables, cut-over forest areas, and in mango groves and roads. They alight on logs, tree trunks, buildings, on leaves and occasionally on the ground. Both males and females are attracted to rotting fruit, small sugar cane presses, and will come to fermented banana baits. They very rarely enter a trap, but fly around baits and become excited but rarely feed directly on a bait. They are sometimes found in open dry scrubby areas, but are more common in lightly forested areas. They fly quite fast and may be difficult to catch. They are most active from 0900 to 1300 hours.

Adults have been collected from sea level to an altitude of 1,500 m. They occur throughout the year with a population peak from June to October in the main rainy season in parts of Mexico.

Specimens Examined 188 ♂, 166 ♀

UNITED STATES: Texas, Hidalgo Co., Santa Ana Reserve; Madera; Benston-Rio Grande Valley St. Pk.; Pharr; Cameron Co., Los Indios; Harlingen; Brownsville; MEXICO: Tamaulipas, Cañon del Novillo; El Limón; San Fernando; Gómez Fariás; San Francisco; Soto La Marina; Altamira; Ciudad Victoria; El Mante; Veracruz, Tampico; Rio Calabazas; Tuxpan; Carrizal; Presidio; Córdoba; Teocelo; Coatepec; Altamira; Ocotla; Tuxtlas; Motzorongo; Vigía Santiago; Santa Rosa; Misantla; Orizaba; Jalapa; Tapalapa; Villa Terrazas; Nuevo Leon, Monterrey; San Luis Potosí, Tamazunchale; El Bañito; Quinta Chilla; Palitla Canyon; Llera; Valles; El Salto; El Sol; El Pujol; Micos; Xilitla; Matlapa; Puebla, Cuetzalan; Matamoros; Oaxaca, Palomares; Chiltepec; Tehuantepec; Matías Romero; Rio Sarabia; Huajuapán; Morelos, Las Estacas; Huajintlán; Yautepec; Cuernavaca; Campeche, Campeche; Escarcega; Yucatán, Pisté; Uxmal; Chichen Itza; San Felipe; Quintana Roo, Caba, S. W. Laguna Macanyx; Sinaloa, Mazatlán; 70 km. N.W. Mazatlán; Culiacán; Venado; Nayarit, Tenacatita; Tepic; Colima, Coquimatlán; Manzanillo; La Salada 300 m.

Myscelia ethusa chiapensis [ssp. nov.]

Fig. 66-69, 90, 101, 107

Description: Male. Forewing truncate, extended at M₁, margin sinuate, hindwing margin sinuate. DFW black with blue stripes and irregular markings, three narrow blue longitudinal stripes in the discal cell. One white macula in the inner postmedian row,

four white maculae in the outer postmedian row and two thin dashes in the subapical area, white maculae in outer postmedian row in M_2 - M_3 diffuse and elongated with a small white dash line proximal or connected to this macula. VHW mottled with dark.

Male genitalia and hypandria not significantly different from *M. e. ethusa*.

Female. Similar to male but with one broad and one thin pale blue longitudinal stripe in the discal cell, white macular pattern similar to *pattenia* ♂. DFW outer postmedian white maculae in M_1 - M_2 and M_2 - M_3 diffuse and elongate extending inward to white maculae in inner postmedian band and in M_2 - M_3 may fuse the two maculae together in a long white bar. Dorsal stripes and bands usually blue.

Average wing length ♂ (29-35)32 mm, ♀ (32-36)33 mm.

Described from 22 specimens, 10 ♂ and 12 ♀.

Genitalia vials ♂ M6543 and ♀ M6542 and M6551.

HOLOTYPE: MEXICO: *Chiapas*, Cd. Cuauhtémoc 1 ♂ Feb. 9, 1969. Coll. R. Wind. (AA);

PARATYPES: MEXICO: *Chiapas*, Cd. Cuauhtémoc 700 m 1 ♂ 2 ♀ Feb. (AA); Mapastepec 2 ♂ Jun. Aug. (AA); Comitán 4 ♂ 2 ♀ May-Aug. (AA); Ocotal 1 ♂ 2 ♀ May (AA); Ocozocuaula 1 ♀ Aug. (JC); 1 ♀ (AM); Las Delicias 1 ♀ Jun. (AA); Lagos de Montebello 1 ♀ Sep. (AA); Mazatán 1 ♀ July (AA).

Holotype and 17 paratypes in Allyn Museum, one paratype in American Mus. Nat. Hist., one paratype in Jenkins Collection, one paratype in the Milwaukee Museum, and two paratypes in the de la Maza collection.

Distribution: Occurs from northern Guatemala through Chiapas, Mexico to southern Oaxaca, Mexico.

Taxonomy and Variation: *M. pattenia* was considered to be a subspecies of *M. ethusa*



Figures 66-69. *Myscelia ethusa chiapensis* Jenkins. ♂ dorsal (66) ventral (67) surfaces. Holotype MEXICO, *Chiapas*, Cuauhtémoc (AA). ♀ dorsal (68) ventral (69) surfaces. Paratype MEXICO, *Chiapas*, Lago de Montebello (AA).

until a difference was found in the hypandrium and characters other than male *pattenia* having the white maculation pattern of female *ethusa*. I also treated *ethusa chiapensis* as an intergrade population. However, the extensive white markings that exist in *chiapensis*, that do not occur in either *pattenia* or *ethusa* and the rather large area from N. Guatemala through Chiapas to S. Oaxaca makes recognition of a subspecies more credible. *M. ethusa chiapensis* is considered to be a relatively recent taxa derived from *M. pattenia* and *M. ethusa*. A trace of the characteristics of *chiapensis* appear to extend northeastward to San Luis Potosí, but not westward. A specimen showing intergradation between *M. pattenia* and *M. ethusa* reported by Godman & Salvin (1883, pl. 24) and (1901) identified as *M. rogenhoferi* appears to be a female *M. ethusa chiapensis*. Accuracy of the locality record of Guazacapán, Guatemala is probably doubtful and *M. pattenia* occurs there.

Biology: This species occurs in dry scrubby or light forest areas especially in stream valleys.

It has been collected from near sea level to about 1,000 m in January and February and from May to September and November.

Nothing is known of the immature stages or food plants.

Specimens Examined: 19 ♂ 23 ♀

MEXICO: *Chiapas*, San Jeronimo 1 ♀ Aug. AM; Rancho Santa Ana 1 ♂ 1 ♀ AM; Sierra Blanca 1 ♂ 1 ♀ Aug. AM; Palmas Reales 1 ♂ 1 ♀ Jun. AM; Ocotal 1 ♂ 2 ♀ May AA; Cd. Cuauhtémoc 700 m 2 ♂ 2 ♀ Feb. AA; Comitán 4 ♂ 2 ♀ May-Aug. AA; 1 ♀ May MM; 4 ♀ Jun. AM; Mapastepec 2 ♂ Jun. Aug. AA; 1 ♂ AD; Las Delicias 1 ♀ Jun. AA; Mazatán 1 ♀ Jul. AA; Lagos de Montebello 1 ♀ Sep. AA, 1 ♀ AD; Chorreadero 1 ♀ Aug. DM; Malpaso 3 ♂ Jan. AM; Ocozacoautla 1 ♂ 1 ♀ Nov. DM, 1 ♀ Jan. AM; Huiztla 1 ♀ AD; *Oaxaca*, Tehuantepec 1 ♀ Jun. DM; GUATEMALA: *Quetzaltenango*, Coatepeque 1 ♂ CS; *Santa Rosa*, Guazacapán 1 ♂ (Coll. Le Moults) AA.

Myscelia cyananthe

M. cyananthe and two subspecies occur from New Mexico and Baja California through Mexico south to Guatemala with doubtful records in Venezuela and French Guiana. It is relatively uncommon but can be locally common in specific localities in dry areas especially in river valleys.

The female of *M. c. cyananthe* has remained unknown for over a century. It was identified only recently from Rancho Viejo, Mexico and is very similar to female *M. e. ethusa*. The difference between the male and female of *M. c. cyananthe* is shown in a gynandromorph, fig. 11, and Díaz Francés (1983). The female of *M. c. cyananthe* is also illustrated by Beutelspacher (1982, figs. 14 & 15, from Jalisco, Mexico), who identified it as a male *M. cyaniris* and claimed the first record of *cyaniris* for the Pacific slope of Mexico (see *M. cyaniris alvaradia*.)

The females of the subspecies *skinneri* and *streckeri* have the white maculation pattern of male *M. e. ethusa*.

Key to Subspecies of *Myscelia cyananthe*

Males.

- 1a. No blue or bluish purple bands present; DFW with purplish basal posterior area, the rest black with exception of two prominent outer postmedian white spots. DHW with a single purple basal area and a thin submarginal line (Baja California only)..... *streckeri*
- 1b. DFW with three basal longitudinal stripes of blue or purple in discal cell; DHW with a submedian and a wide inner postmedian cross band and thin

- submarginal line 2
- 2a. Bands and stripes on dorsal surface of wings blue to bluish purple; DFW with two median costal blue spots; outer postmedian area with two prominent blue maculae, area below subapical angle with prominent blue submarginal markings which may extend to posterior angle of wing *cyananthe*
- 2b. Bands on dorsal surface of wings purple, rarely bluish purple; DFW with none or very reduced median costal purple spots; outer postmedian area with two small whitish spots, area below subapical angle with two small purple spots (N.W. Mexico)..... *skinneri*

Females.

- 1a. DFW with an inner postmedian row of five white maculae, a median white macula in Cu₁-Cu₂..... *cyananthe*
- 1b. DFW with three inner submedian white maculae, no median white macula in Cu₁-Cu₂..... 2
- 2a. DHW with a broad basal bluish-purple area, followed by three prominent cross bands including a median band..... *skinneri*
- 2b. DHW with a broad basal purple area followed by a thin outer postmedian and a thin submarginal line, no prominent median cross band..... *streckeri*

Myscelia cyananthe cyananthe (C. & R. Felder) 1867 [Stat. rev.]

Figs. 70-73, 91, 102, 108

Faunia cyananthe C. & R. Felder, 1867, Reise Novara Lep. 3:408-409, n. 619 t. 53, f. 6, 7. TL: MEXICO. Holotype: 1 ♂ HT BM 15-140, Rh. 9291 (Kaden Coll.) (Examined). (Figs. 70 & 71)

Description: As in *M. cyananthe* except for differences listed for *M. c. cyananthe* in the key to subspecies. Average wing length ♂ (25-32)28 mm, ♀ (28-35)33 mm.

Distribution: From western Mexico in Colima south in Morelos in the Balsas River valley and to Guatemala. Intergrades occur in Sinaloa and Jalisco. There is a female *M. c. cyananthe* with a triangular label stating "Venezuela, *Miscelia orsis*" [sic.] in the Los Angeles County Museum collection. There is also a female *M. c. cyananthe* from French Guiana in the AM collection. The locality data on these specimens are extremely doubtful. The literature records in the United States by Klots (1951) for Pharr, Texas and Howe (1975) for Brownsville, Texas are not substantiated by any specimens examined. Pyle (1981) erroneously states "the Cyananthe Blue Wing is the only other member of the genus to occur in this country with any frequency."

Taxonomy and Variation: The holotype ♂ in the BM is typical *M. c. cyananthe*, and is illustrated in Figs. 70 and 71. There is some variation in the size and color of specimens in a single locality at Rancho Viejo. Sr. Alberto Díaz Francés gave me 2 ♂ and 2 ♀ of a small purplish population and 2 ♂ and 2 ♀ of large blue specimens collected on the same date. I have also collected specimens like these at Rancho Viejo, but there is a wide variation in large samples. It appears that there is some intergradation with *M. c. skinneri*, but the ♀ ♀ are typical *M. c. cyananthe*. The extremes of the population are strikingly different.

M. c. cyananthe females have been missing for over one hundred years and has been a subject of speculation. For example, Butler and Druce (1872) suggested that the type of *M. pattenia* might be the female of *M. cyananthe*, but as Godman & Salvin (1883) pointed out it is a male and could not be. Sr. Alberto Díaz Francés (pers. comm.) found that only *M. cyananthe* occurs at Rancho Viejo, Mexico and *M. ethusa* was absent. The females flying there are similar to ♀ *M. ethusa*, but differ as noted in the key to

subspecies. Confirmation of this was made by the discovery of a gynandromorph with the right side ♂ and the left side ♀ showing positive correlation of the two sexes. This is shown in fig. 11. This was additionally confirmed by the present author collecting a pair in copula at Rancho Viejo.

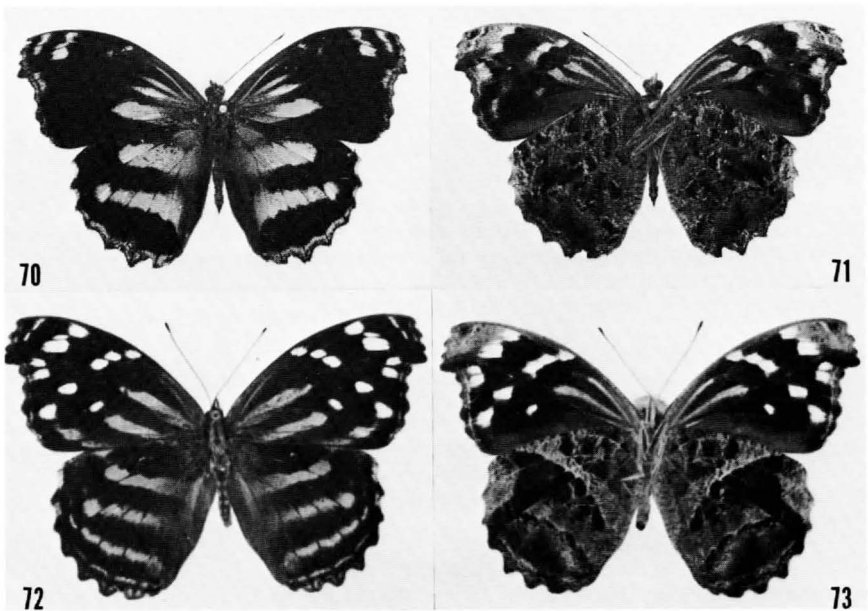
An interesting aberration is in the de la Maza collection. A male has the DHW with only one broad blue bar. The broad postmedian bar is missing (as in *streckeri*) but all other characteristics are typical *M. c. cyananthe*. This specimen was collected at Rancho Viejo.

Biology: *M. cyananthe* is relatively uncommon in collections, however, I have found it to be quite common in certain localities in its range.

It is found in relatively dry areas in stream valleys, both in scrubby or light forest, or in open rocky sites. Adults occur in both uninhabited wild places as well as populated or cattle grazing areas. I collected over 25 adults in one afternoon at Rancho Viejo, Morelos, Mexico on wet soil around an overflowing cattle watering trough. The dark *M. cyananthe* were quite distinctive among the thousands of butterflies concentrated at this site. The adults are also found at specific localities along stream beds and can be found at these same localities year after year. They fly back and forth in the stream bed and when disturbed fly into any brush or into irregular places in stream banks. Males are more common (131) than females (46) in collections. Before recognizing how similar females of *M. cyananthe* are to *M. ethusa*, some were misidentified (but determined later). However, in field observations the females were observed to be less than 25% of the total population.

A pair of *M. cyananthe* were collected in copula on 9 Nov. 1982 at 1600 hours by the author on the side of a stream bed at Rancho Viejo, Mexico.

Adults have been collected from sea level to about 1,000 m elevation, and throughout the year but more commonly from June to September.



Figures 70-73. *Myscelia cyananthe cyananthe* (C.&R. Felder). ♂ dorsal (70), ventral (71) surfaces. MEXICO, Holotype *Faunia cyananthe* C. & R. Felder (BM). ♀ dorsal (72), ventral (73) surfaces. MEXICO, Morelos, Rancho Viejo (JC).

Immatures Stages: Nothing is known to have been reported on the immature stages and food plants of *M. c. cyananthe*.

Specimens Examined: 131 ♂ 46 ♀

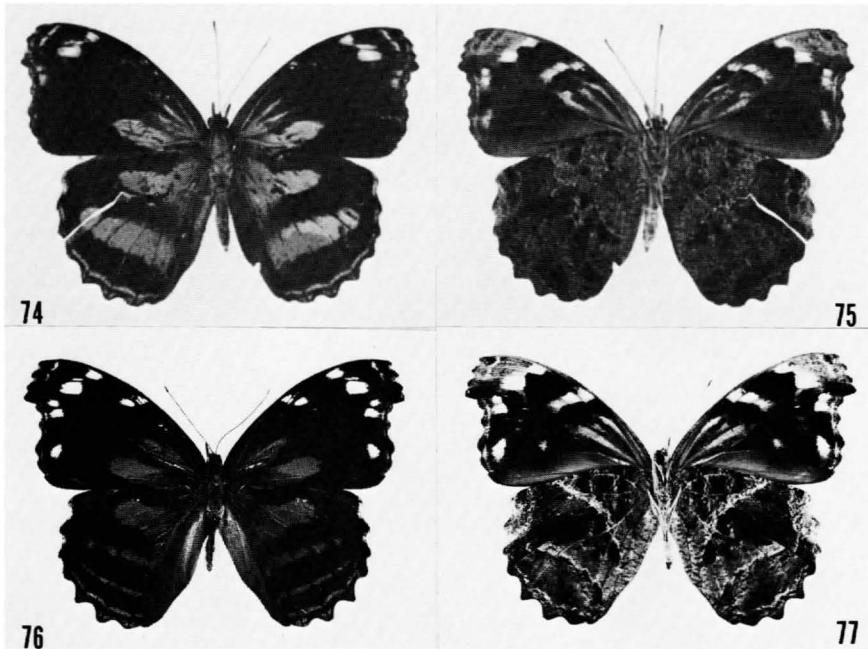
MEXICO: *Sinaloa*, Chametla; Costa Playa X; *Jalisco*, Tenacatita; *Colima*, La Salada; Comala; Colima; Coliavinatlán; Manzanillo; *Guerrero*, Rio Balsas 800 m; Iguala; Mezcala; Acahuizotla; Ayutla; Cacahuamilpa; *Morelos*, Xochicalco; Cañon de Lobos; Rancho Viejo; Cuernavaca; Tepoztlán, Jojutla; Cuautla; *Hidalgo*, La Encarnacion; *Veracruz*, Presidio; Ocotal; Peñuela; *Puebla*, Matamoros; *Oaxaca*, Las Animas; Cozomatla; Totolapán, *Chiapas*, Chicoasen; Benito Juárez; Comitán; Tuxtla Gutierrez; Lagos de Montebello; Rancho Santa Rosa; Mapastepec; Tapachula; GUATEMALA: *El Petén*, El Petén; San Luis; VENEZUELA: No specific locality 1 ♀ triangle label — "*Miscelia orsis*:" LA; "FRENCH GUIANA" 1 ♀ AM.

Myscelia cyananthe skinneri Mengel, 1894 [Stat. rev.]

Figs. 74-77, 92, 102, 108

Myscelia skinneri Mengel, 1894. Entomol. News 5:96. TL: Mexico, *Sinaloa*, Bayemena. Syntypes: 1 ♂ HT, 1 ♀ AT, 2 ♀ 1 ♀ "Cotypes" described from 5 specimens in Reading Pub. Mus. & Art Gallery, Reading, Pa. Lectotype figured (Fox, 1942). Also 1 ♀ labeled "Orig. type, Sinaloa, Mex., L. Mengel," in Strecker Coll. in Allyn Museum (Examined).

Description: As in *M. cyananthe* except for differences listed for *M. cyananthe skinneri*



Figures 74-77. *Myscelia cyananthe skinneri* Mengel. ♂ dorsal (74) ventral (75) surfaces. MEXICO, *Sonora*, Álamos (AA). ♀ dorsal (76) ventral (77) surfaces. MEXICO, *Sinaloa*, Culiacán (AA).

in the key to subspecies. Average wing length ♂ (23-31)29 mm, ♀ (26-33)31 mm.

Distribution: From near Alamogordo, New Mexico through northwestern Mexico in Sonora and Sinaloa, with some apparent intergradation in Colima and Michoacan.

Taxonomy and Variation: The holotype and other types were examined and compared with a series of specimens and no significant differences were noted. There is much variation in size. The smaller individuals are usually purplish and the larger bluish but exceptions occur. Most specimens are slightly purplish in color in comparison with *M. c. cyananthe*. There is some variation in the amount of white in the two small whitish spots in the outer postmedian area of the DFW, but always smaller spots than in *streckeri*.

Biology: The adults are found in stream valleys and canyons in dry areas. They are found from sea level to 1600 m, more commonly in August to October, but there are a few records from June, July, December and January. The record in New Mexico was in May which would almost certainly be a migrant.

There are no known reports on the immature stages or food plants.

Specimens Examined: 26 ♂ 20 ♀

UNITED STATES: New Mexico, Dry Cañon, Sacramento Mts, Alamogordo 1 ♀ May S.M. #167, CM; MEXICO: Sonora, Álamos 4 ♀ 3 ♀ Aug. Sep. AA, 2 ♂ 1 ♀ Aug. AM; Sonoma 1 ♂ Nov. AM; Hermosillo 1 ♂ Aug. AM, 1 ♀ DM, 2 ♂ Oct. CM; Guaymas 1 ♂ 1 ♀ Sep. AA; 1 ♂ Jun. CS; 50 km. N. Guaymas 1 ♀ Oct. CM; Navajoa 1 ♀ Oct. CM; Guiricoba 430 m 2 ♂ 1 ♀ Aug. AM; Nuri Arroya Chico 3 ♀ Oct. AM; Yécora 1600 m 2 ♂ Sep. Oct. AM; Obregon Dam 2 ♂ 3 ♀ Aug. AM; Sinaloa, Mazatlán 2 ♂ Aug. AM; Los Mochis 1 ♂ 1 ♀ Oct. CM; 1 ♂ 1 ♀ Jul. Sep. AA; Culiacán 1 ♂ SI, 2 ♂ 1 ♀ Jun. Jul. AA; Venado 1 ♀ SI; Bayemena 1 ♂ 1 ♀ ST.

Myscelia cyananthe streckeri Skinner 1889 [Stat. rev.]

Figs. 78-81, 93, 102, 108

Myscelia streckeri Skinner, 1889. Trans. Amer. Ent. Soc. 16:87. [Described in Mar. 1889]. TL: Mexico, Baja California (5 specimens coll. by A. G. Weeks. Syntypes: "Holotype ♀" with label "*Mys. Streckeri*, Skinner, Lower Calif. near Cape St. Lucas, Orig. type, ex. Skinner." It is in the Strecker Coll. now in the Allyn Mus. It was sent to Strecker by Dr. Skinner. There is a second ♀ under the original type label. A specimen was labeled Type No. 7051 in the Phila. Acad. Nat. Sci. Philadelphia, now in CM. There is also a syntype in MZ (all types examined).

=*Myscelia auletes* Godman & Salvin, 1889. Ann. Mag. Nat. Hist. (6) 3:354 [Described in Apr. 1889]. TL: Mexico: Baja California, Pichilingue. Syntypes: 1 ♂ in BM labeled HT, type no. Rh. 9292, coll. by J. J. Walker (Examined) [Syn. nov.]. (Figs. 78-79).

Description: As in *M. cyananthe* except for differences listed for *M. cyananthe streckeri* in the key to subspecies. Average wing length ♂ (28-30) 29 mm, ♀ (30-32)31 mm.

Distribution: Found only in the southern half of the Baja California peninsula, especially on the eastern side.

Taxonomy and Variation: I have examined the types of both *streckeri* and *auletes* and they are the same. Since *streckeri* was published in Mar. 1889 and *auletes* in Apr. 1889, the name *streckeri* has priority. The wing pattern, the male genitalia and hypandrium show that it is a subspecies of *M. cyananthe*. This appears to be the end of the evolutionary line in reduction of pattern in the male. The light purplish color is characteristic, but this color is found occasionally in *M. c. cyananthe* and *M. c. skinneri*.

The female pattern of white maculae is the same as that of the male of *M. e. ethusa* (and female of *M. c. skinneri*). No intergrades are known, probably related to its isolation in the Baja California peninsula.

Biology: This subspecies is fairly common in mesquite-cats-claw associations especially in dry stream valleys or arroyos. It comes readily to injured trees or shrubs with sap runs accordings to Miller (pers. comm.). Adults have been collected throughout the year with perhaps largest numbers in September to November. They occur from sea level to 300 m or more elevation.

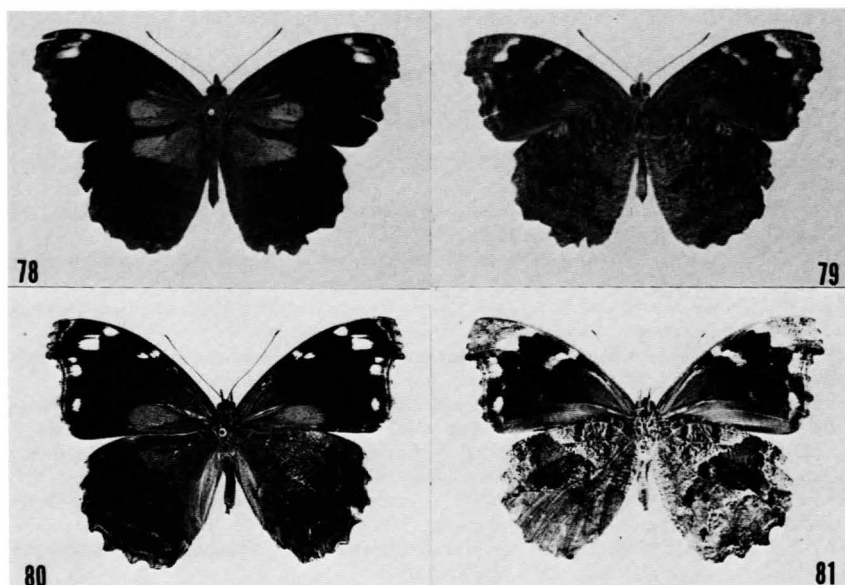
Nothing is known to have been reported on the life history or food plants.

Specimens Examined: 97 ♂ 63 ♀

MEXICO: *Baja California Sur*, San Pedro 150 m; El Triunfo; Rancho Vinarama; Boca de la Sierra; Rancho Palmarito; La Paz Bay; La Paz; Cabo San Lucas; San Bernardo; Arroyo Candelaria; Rancho Rosarito; Rancho Buenavista; La Ciénaga; Sierra Laguna; Mesa Punta Azul; Pichilingue; Las Cruces; Rancho Potereros; El Novillo; Arroyo de los Chilos; San Bartolo; Boca de la Sierra; Colonia Calles; Miriflores; Rancho Nigrino; Bahía Concepción; Mulegé; Bahía Agua Verde; Todos Santos.

REFERENCES

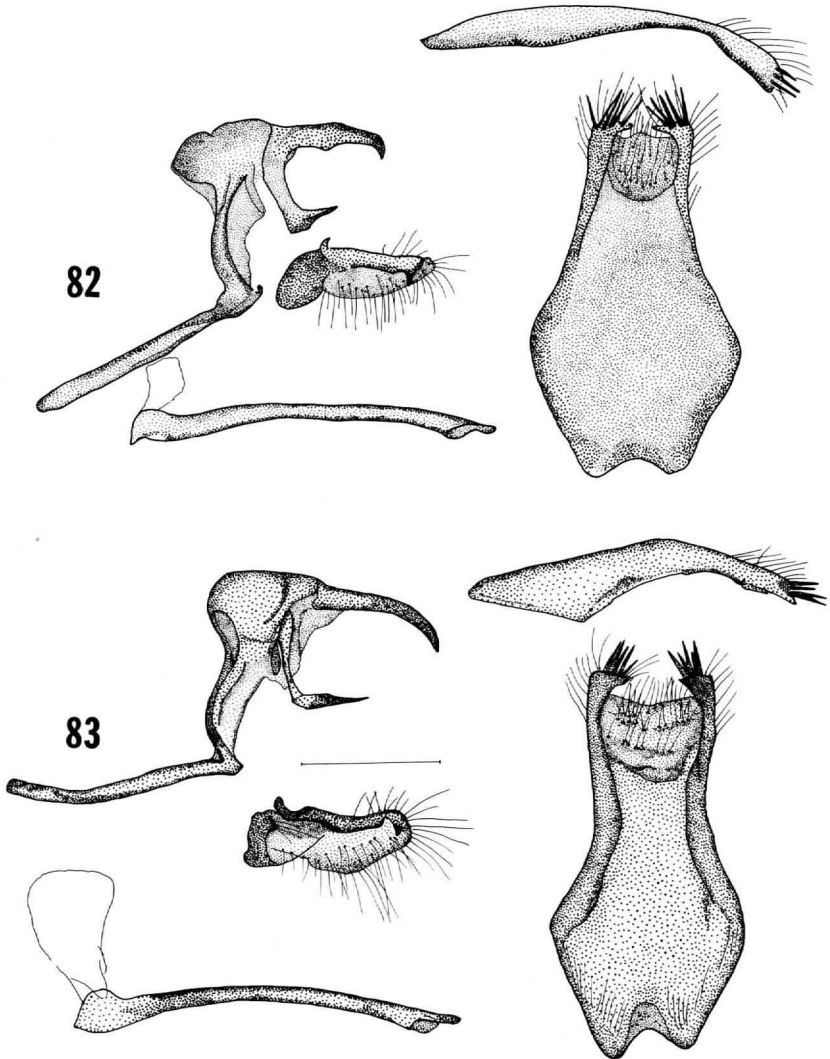
- Beutelspacher, C. R. 1982. Lepidopteros de Chamela, Jalisco, Mexico I. Rhopalocera. An. Inst. Biol., Univ. Nal. Mex. 52: 371-388.
 Butler, A. G. 1873. Description of new species of Lepidoptera. *Cist. Ent.* 1:151-177.
 Butler, A. G. and H. Druce. 1872. Descriptions of new genera and species of Lepidoptera from Costa Rica. *Cist. Ent.* 1:95-118.



Figures 78-81. *Myscelia cyananthe streckeri* Skinner. ♂ dorsal (78) ventral (79) surfaces. MEXICO, *Baja California*, Pichilingue, Holotype *Myscelia auletes* Godman & Salvin (BM). ♀ dorsal (80) ventral (81) surfaces. MEXICO, *Baja California*, Cape St. Lucas (ST).

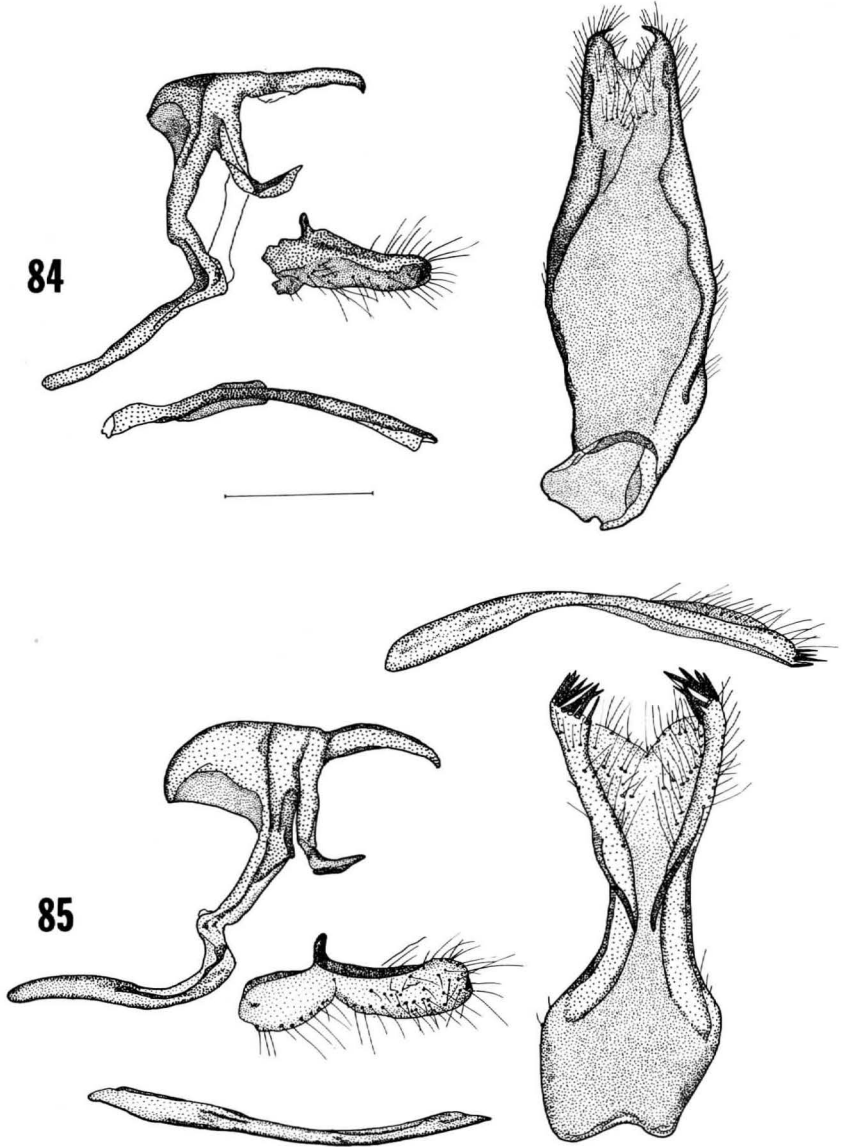
- Costa Lima, A. C. da. 1936. *Terceiro Catálogo dos insectos que vivem nas plantas do Brasil*. Rio de Janeiro, Esc. Nac. Agron. 460 pp.
- D'Almeida, R. F. 1922. *Mélanges Lépidoptérologiques*. I. Études sur les Lépidoptères du Brésil, R. Friedlander & Sohn, Berlin, viii + 226 pp.
- Díaz Francés, A. 1983. Cover Photograph. *Rev. Soc. Mex. Lepid. Soc.* 8(2).
- Felder, C. and R. Felder. 1861. *Lepidoptera nova Columbiae*. *Wien. Ent. Monat.* 5(4): 97-111.
- Felder, C. and R. Felder. 1867. *Reise der osterreichischen Fregatte Novara un die Erde in den Jahren 1857...Zool. Theil. Zweiter Band: Zweiter Abtheilung*, Vienna, 5 parts. Heft 3:pp. 379-535; pls. 48-74.
- Felder, R. 1869. Diagnosen neuer von dem K. K. Oberlieutenant H. v. Hedemann in Mexico in den Jahren 1865-1867 gesammelter Lepidopteren. *Verk. Zool. Bot. Ges. Wien.* 472, n. 22.
- Fox, R. M. 1942. *Catalogues of the types in the L. W. Mengel butterfly collection*. Reading Pub. Mus. & Art Gallery, Reading, Pa. Sci. Pubs. No. 4, 27 pp.
- Gabriel, A. G. 1927. *Catalogue of the type specimens of Lepidoptera Rhopalocera in the British Museum*, Pt. 3, Nymphalidae. Oxford Univ. Press, 128 pp.
- Gali, F. and A. Schwartz. 1983. *Myscelia antholia* (Nymphalidae) in the Dominican Republic. *J. Lepid. Soc.* 37(2):164-165.
- Godart, J. B. [1824]. In Latreille, P. A. and J. B. Godart, 1819-[1824], *Encyclopedie Methodique. Histoire Naturelle [Zoologie]*. 9 Entomologie. Paris. 828 pp.
- Godman, F. D. and O. Salvin [1883]. *Biologia Centrali-Americana. Insecta. Lepidoptera-Rhopalocera*. Taylor & Francis, London, 1:267-274.
- Godman, F. D. and O. Salvin. 1901. *Biologia Centrali-Americana. Insecta. Lepidoptera-Rhopalocera*. Taylor & Francis, London, Suppl. 2:689-690.
- Hall, A. 1925. List of the butterflies of Hispaniola. *Entomologist.* 58:161-165, 186-190.
- Hall, A. 1935. New forms of Nymphalinae and Ithomiinae. *Entomologist.* 68:221-227.
- Hayward, K. J. 1950. Un nuevo género para Nymphalidae. *Rev. Soc. Ent. Argent.* 14(5):319-320.
- Hewitson, W. C. 1857. *Exotic butterflies...* London. *Nymphalidae* 2: *Cybdelis* 3, [p. 45, pl. 23] figs. 16, 17.
- Howe, W. H. 1975. *The Butterflies of North America*. Doubleday & Co. Garden City, N. Y. 633 pp.
- Jenkins, D. W. 1983. Neotropical Nymphalidae 1. Revision of *Hamadryas*. *Bull. Allyn Mus.* 81:146 pp., 209 figs.
- Kirby, W. F. 1871. *A synonymic catalogue of diurnal lepidoptera*. London, John Van Voorst 1:690 pp. (1871); 2 (Suppl.):691-883 (1877).
- Klots, A. B. 1951. *A Field Guide to the Butterflies of North America East of the Great Plains*. Houghton Mifflin Co., Boston, 349 pp.
- Klots, A. B. 1970. *Lepidoptera*, pp. 115-130, in Tuxen, S. L. (Ed.) *Taxonomists Glossary of Genitalia in Insects*. Munksgaard, Copenhagen, 359 pp.
- Lamas, M. G. 1979. Additions and corrections to the checklist of western Peru butterflies (Lepidoptera). *Rev. Ciencias Univ. Nac. Mayor San Marcos.* 71(1):54-61.
- Lewis, H. L. 1973. *Butterflies of the World*. Follett Pub. Co., Chicago. 312 pp., 208 pls.
- Miller, L. D. 1970. Nomenclature of wing veins and cells. *J. Res. Lepid.* 8(2):37-48.
- Miller, L. D. and F. M. Brown. 1981. A Catalogue/Checklist of the Butterflies of America North of Mexico. *Lepid. Soc. Mem.* No. 2, 280 pp.
- Moore, D. G. and E. C. Buffington. 1968. Transform faulting and growth of the Gulf of California since the late Pliocene. *Science.* 161:1238-1241.
- Müller, W. 1886. Südamerikanische Nymphalidenraupen, Versuch einer natürlichen Systems der Nymphaliden. *Zool. Jb.* 1:417-678.
- Pyle, R. M. 1981. *The Audubon Society Field Guide to North American Butterflies*. Alfred A. Knopf, New York, 916 pp.
- Riley, N. D. 1975. *A Field Guide to the Butterflies of the West Indies*. Collins, London 224 pp., 24 pls.
- Rober, J. 1946. In Seitz, *Macrolepidoptera of the World*. Vol. 5. Stuttgart.

- Rober, J. 1928. Neue exotische Falter. *Int. Ent. Zeit.* 22:67-71.
- Rosen, D. E. 1976. A vicariance model of Caribbean biogeography. *Systematic Zool.* 24:431-464.
- Smart, P. 1975. *The Illustrated Encyclopedia of the Butterfly World in Color*. Quality Books, Northbrook, Ill. pp. 275.
- Staudinger, O. in Staudinger, O., & E. Schatz. 1884-1888. *Exotische Tagfalter in systematischer Reihenfolge mit Berücksichtigung neuer Arten* Vol. 1: 334 pp., 100 pls. 1885, Vol. 1, pp. 35-102, pls. 31-60; 1886, Vol. 1, pp. 103-174, pls. 61-80;

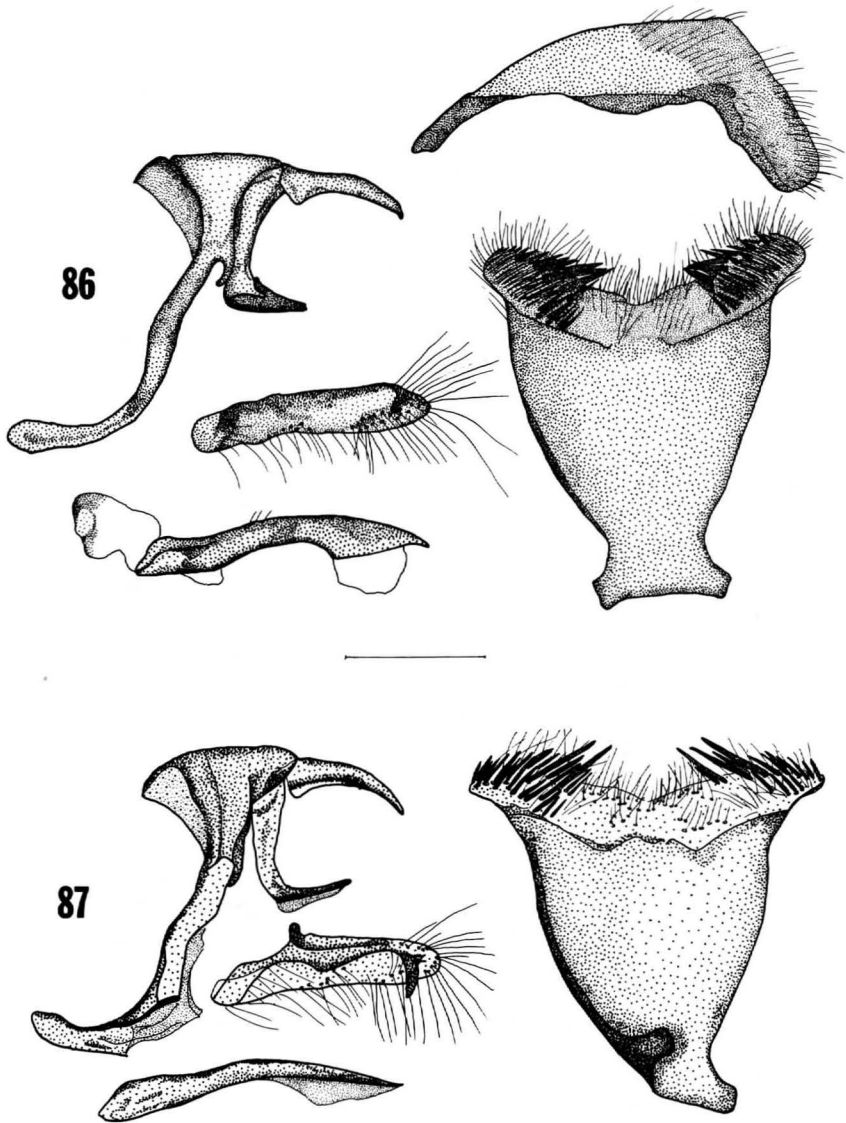


Figures 82-83. ♂ genitalia and hypandria of *Myscelia*. 82, *Myscelia hypatia*. 83, *Myscelia orsis*.

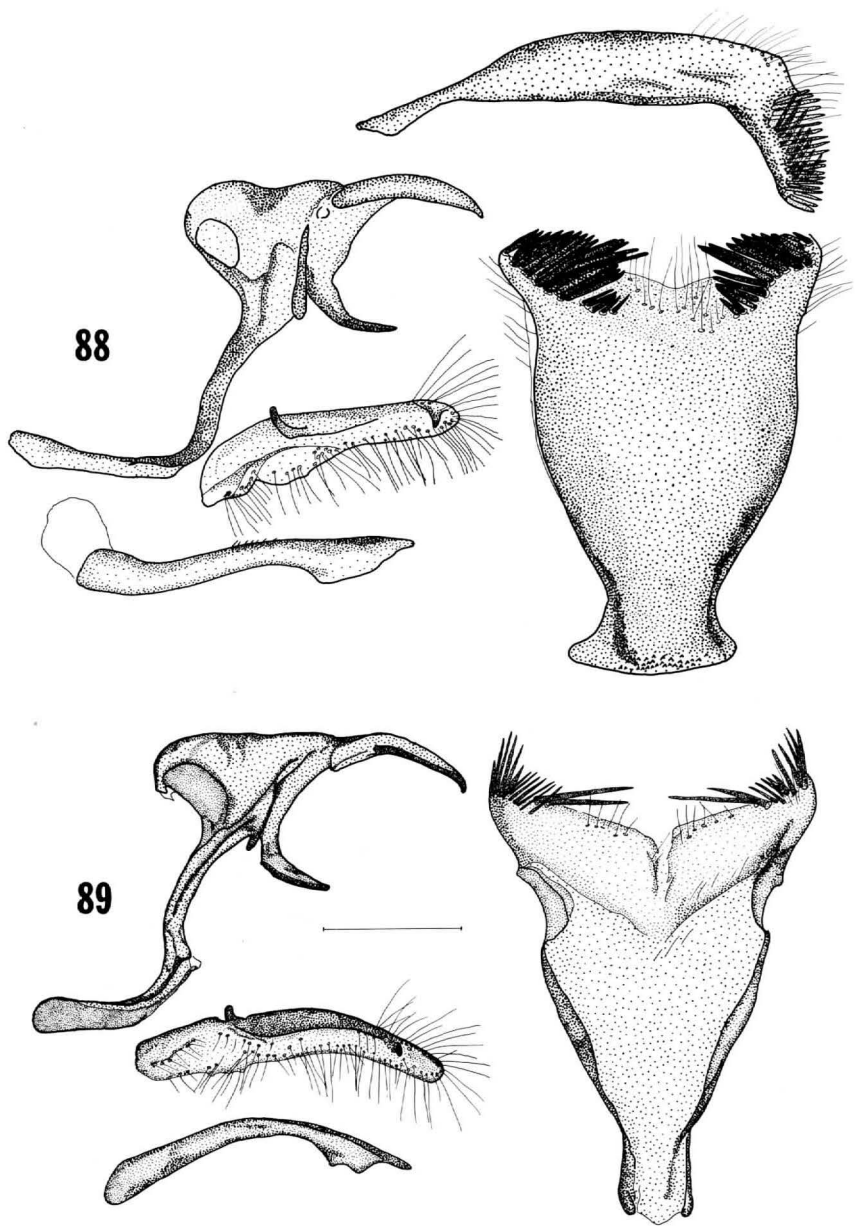
1888, Vol. 1, pp. 235-333, pls. 96-100.
 Tuxen, S. L. 1956. *Taxonomists' Glossary of Genitalia in Insects*. Ejnar Munksgaard, Copenhagen. pp. 284, 215 figs.



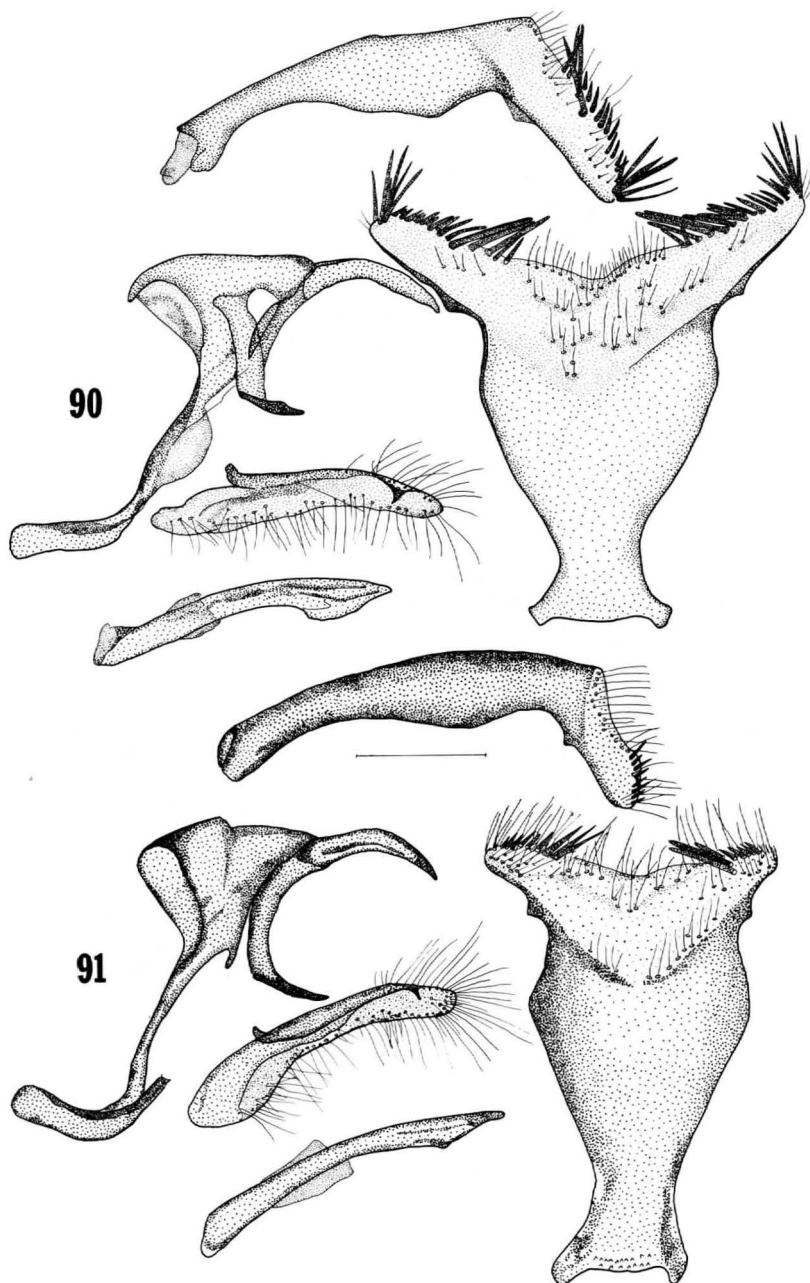
Figures 84-85. ♂ genitalia and hypandria of *Myscelia*. 84, *Myscelia milloi*. 85, *Myscelia capenas*.



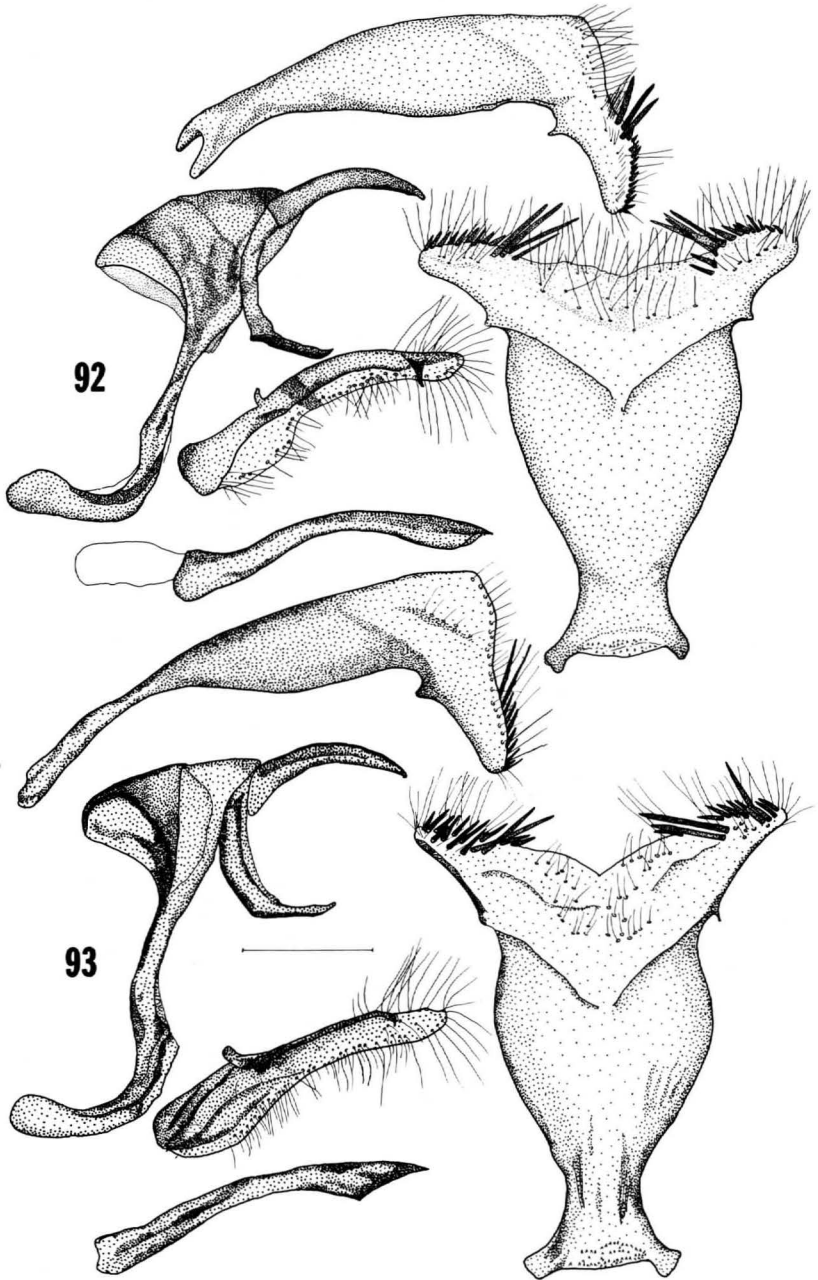
Figures 86-87. ♂ genitalia and hypandria of *Myscelia*. 86, *Myscelia cyaniris*. 87, *Myscelia aracynthia*.



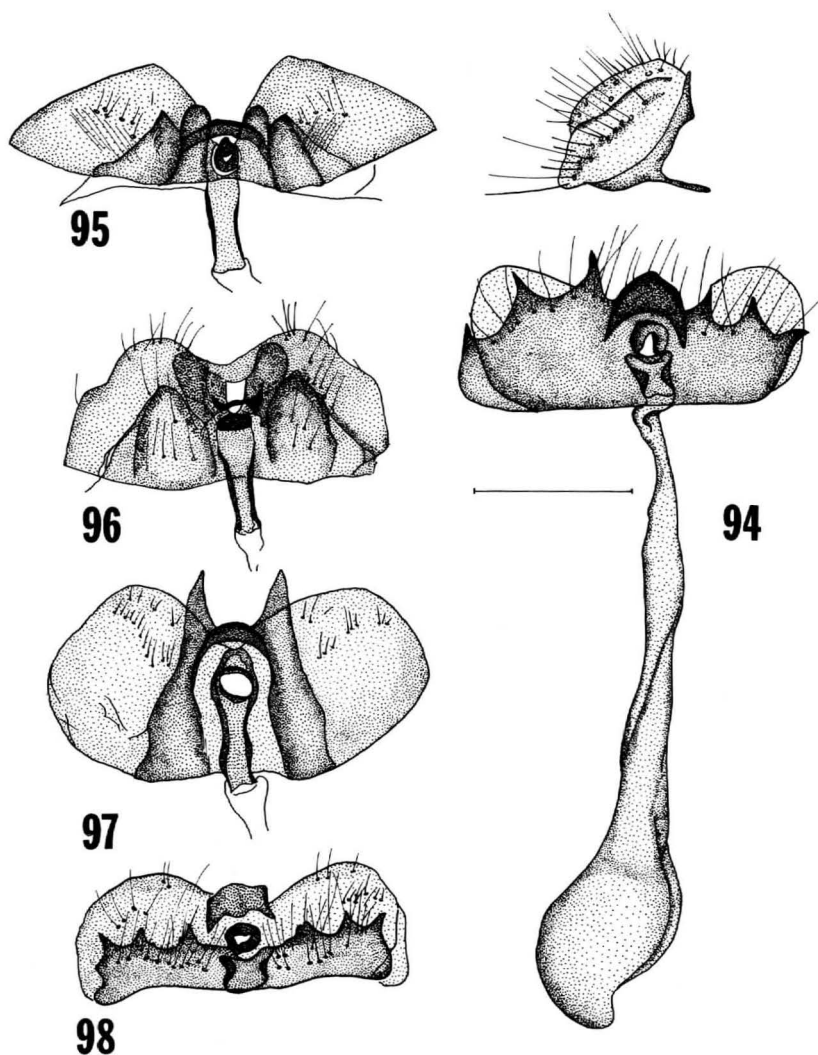
Figures 88-89. ♂ genitalia and hypandria of *Myscelia*. 88, *Myscelia leucocyana*. 89, *Myscelia pattenia*.



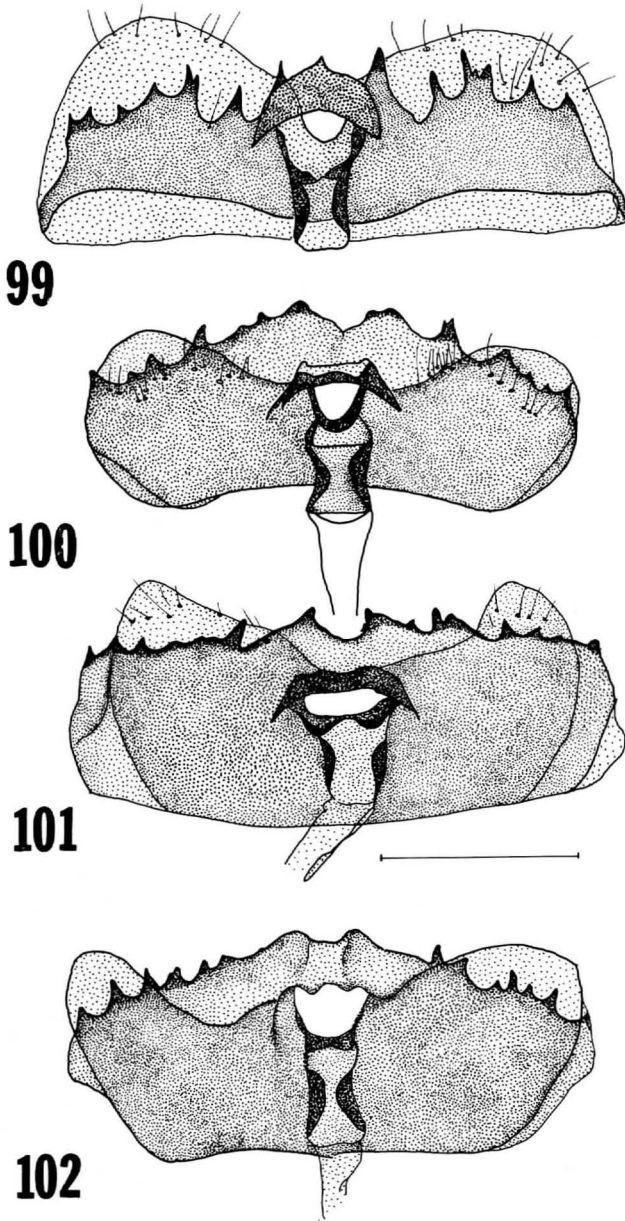
Figures 90-91. ♂ genitalia and hypandria of *Myscelia*. 90, *Myscelia ethusa*. 91, *Myscelia cyananthe cyananthe*.



Figures 92-93. ♂ genitalia and hypandria of *Myscelia*. 92, *Myscelia cyananthe skinneri*. 93, *Myscelia cyananthe streckeri*.



Figures 94-98. Sterigma and associated structures of ♀ genitalia of *Myscelia*. 94, *Myscelia cyaniris albescens* (also shows papilla anale and corpus bursa). 95, *Myscelia hypatia*. 96, *Myscelia orsis*. 97, *Myscelia capenas*. 98, *Myscelia cyaniris cyaniris*.



Figures 99-102. Sterigma and associated structures of ♀ genitalia of *Myscelia*. 99, *Myscelia leucocyana*. 100, *Myscelia pattenia*. 101, *Myscelia ethusa*. 102, *Myscelia cyananthe*.

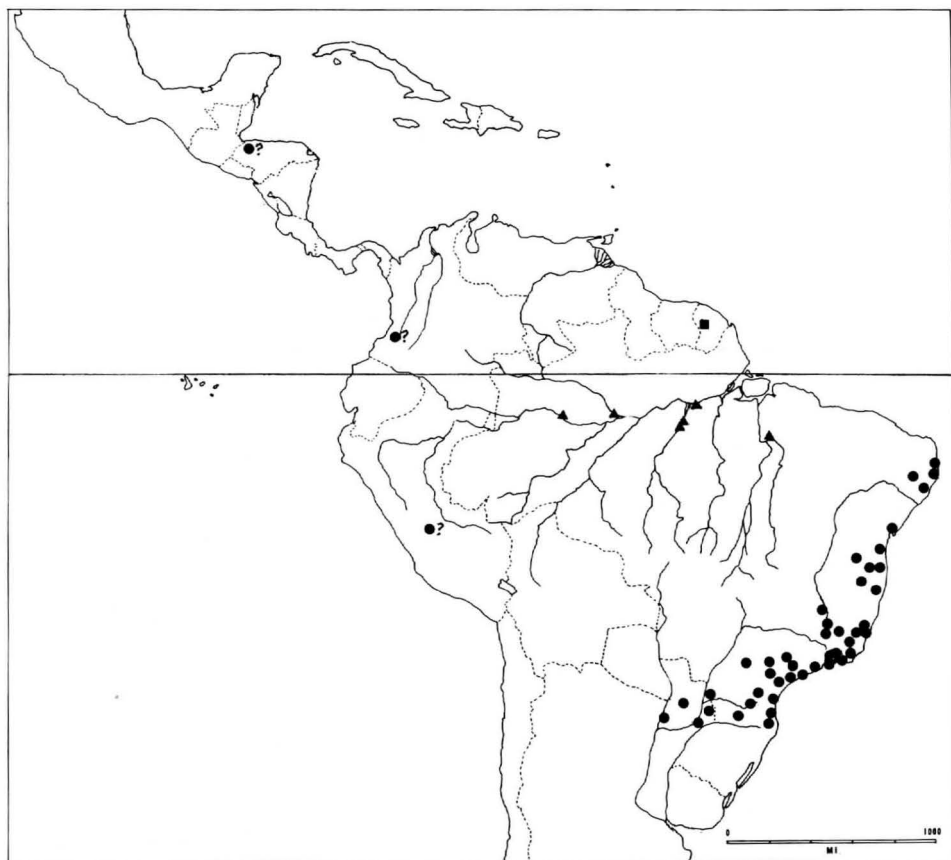


Figure 103. Distribution of *Myselia hypatia* ▲; *Myselia orsis* ●; *Myselia milloi* ■.

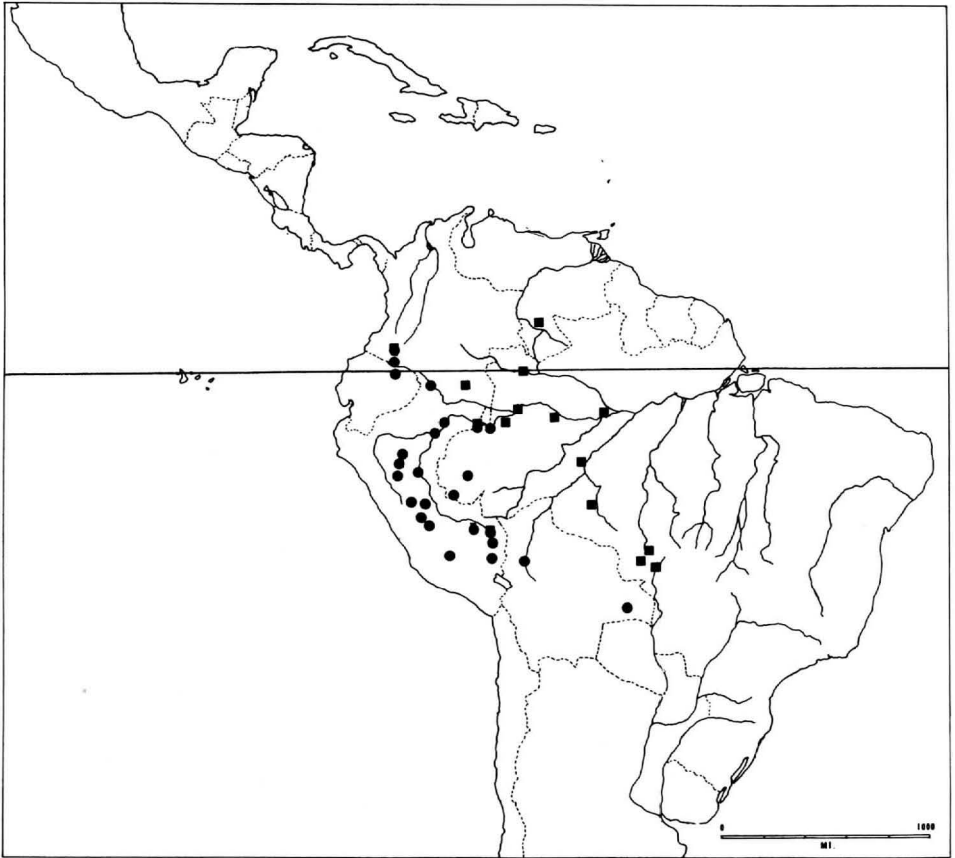


Figure 104. Distribution of subspecies of *Myselia capenas*. ■ = *c. capenas*; ● = *c. octomaculata*.

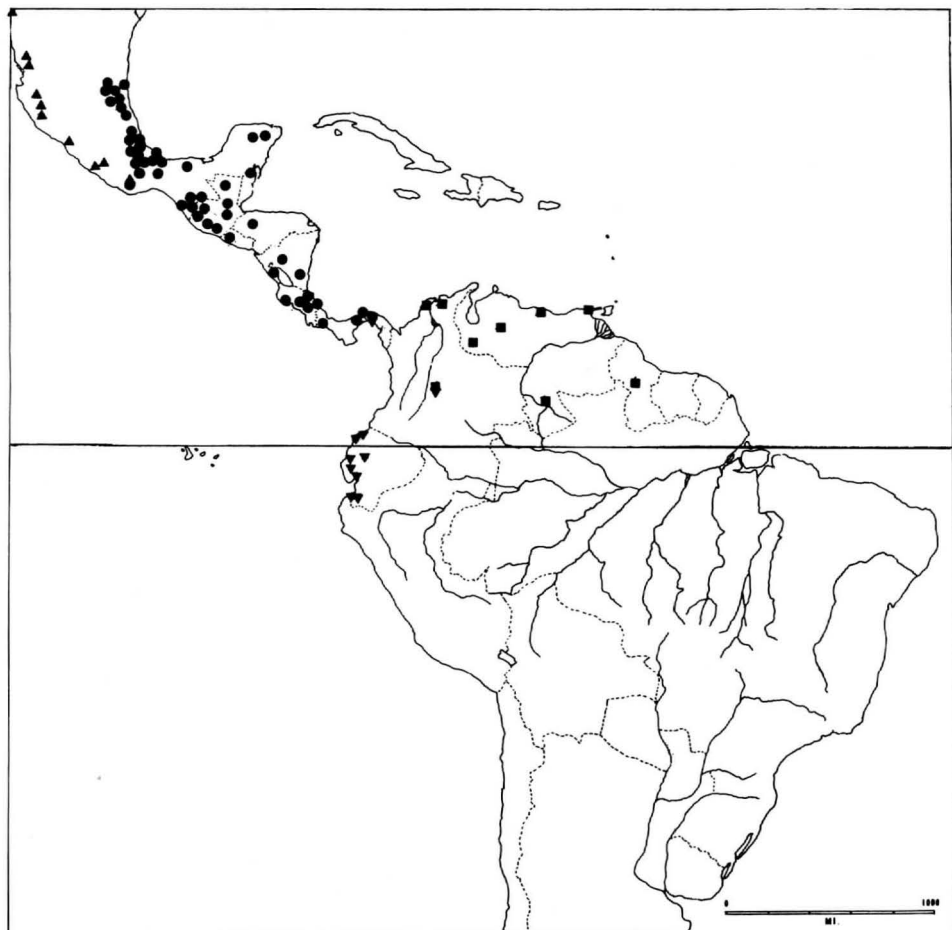


Figure 105. Distribution of subspecies of *Myselia cyaniris*. ● = *c. cyaniris*; ■ = *c. albescens*; ▼ = *c. millerorum*; ▲ = *c. alvaradia*.



Figure 106. Distribution of *Myselia aracynthia* and subspecies of *Myselia leucocyana*. ■ = *aracynthia*; ● = *l. leucocyana*; ▲ = *l. smalli*.

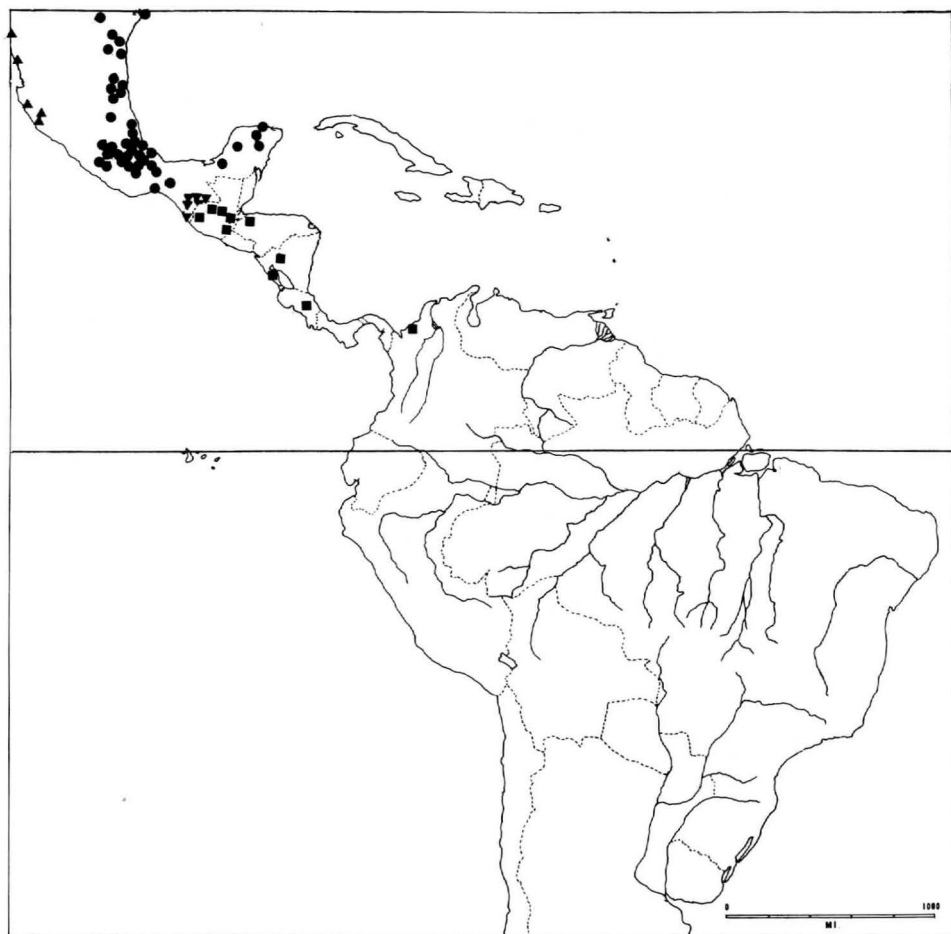


Figure 107. Distribution of *Myscelia pattenia* and subspecies of *Myscelia ethusa*. ■ = *pattenia*; ● = *e. ethusa*; ▼ = *e. chiapensis*.



Figure 108. Distribution of subspecies of *Myscelia cyananthe*. ● = *c. cyananthe*, ■ = *c. skinneri*; ▲ = *c. streckeri*.

This public document was promulgated at a cost of \$219.50 or \$3.65 per copy. It makes available to libraries, scholars and all interested persons the results of researches in Entomology.