TWO NEW SPECIES AND TWO NEW SUBSPECIES OF MEGATHYMIDAE FROM MEXICO AND THE UNITED STATES

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The first species described herein represents an extension of the range of the "*belli* complex" much farther south and east of previously known species. Since it is further removed from the other species it was not unexpected to see that it had major characters which differed from those of the known species. The treatment of the second species described here represents a major change in our procedure, for this is the first time that we have described a species based on a single specimen and without any knowledge of its biology; however this species is unique in so many ways that its description cannot be further delayed.

The two subspecies described herein are not described because of any great difference in their appearance; rather, they look somewhat alike. The significant thing about these two is that they probably represent parallel evolution of two widely separated populations rather than divergence in two closely related, geographically adjacent populations.

Agathymus ricei Stallings, Turner, & Stallings, new species

Female. Upper surface of primaries: flat black, with a few golden brown hairs at the base; spots yellow with a tint of brown; spot 1 square; spots 2, 3, and 4 rectangular, with spot 2 extending inwardly beyond the other two spots; spots 5 and 6 square, set well outside outer edge (extended) of spots 7, 8, and 9; spots 7, 8, and 9 almost square, of about equal size, forming a straight line on their outer edge, inwardly each spot is irregular with spot 8 distinctly convex; golden brown hairs at base extending outward one-third towards outer angle, terminating in an indistinct dull yellow patch, above the golden brown hairs extending outward along vein just below spot 1, terminating in a tiny patch of dull yellow just short of spot 1; fringes checkered dark smoke and white.

Undersurface of primaries: flat black, apex and outer margin well overscaled with white and between spots 1 and 2, 3, 4, 5, and 6 with yellow; all spots of upper surface reappear, lighter in color, spot 2 almost white; the two patches of color of the upper surface not appearing.

Upper surface of secondaries: flat black with golden brown hairs at base, extending outwardly, particularly in anal area; a well-defined discal band of spots, slightly darker than the spots on upper surface of primaries; a minute patch of dull yellow in median area; fringes checkered dark smoke and white.

Undersurface of secondaries: flat black, completely overscaled with white; discal band faintly represented by a slight increase in white overscaling.

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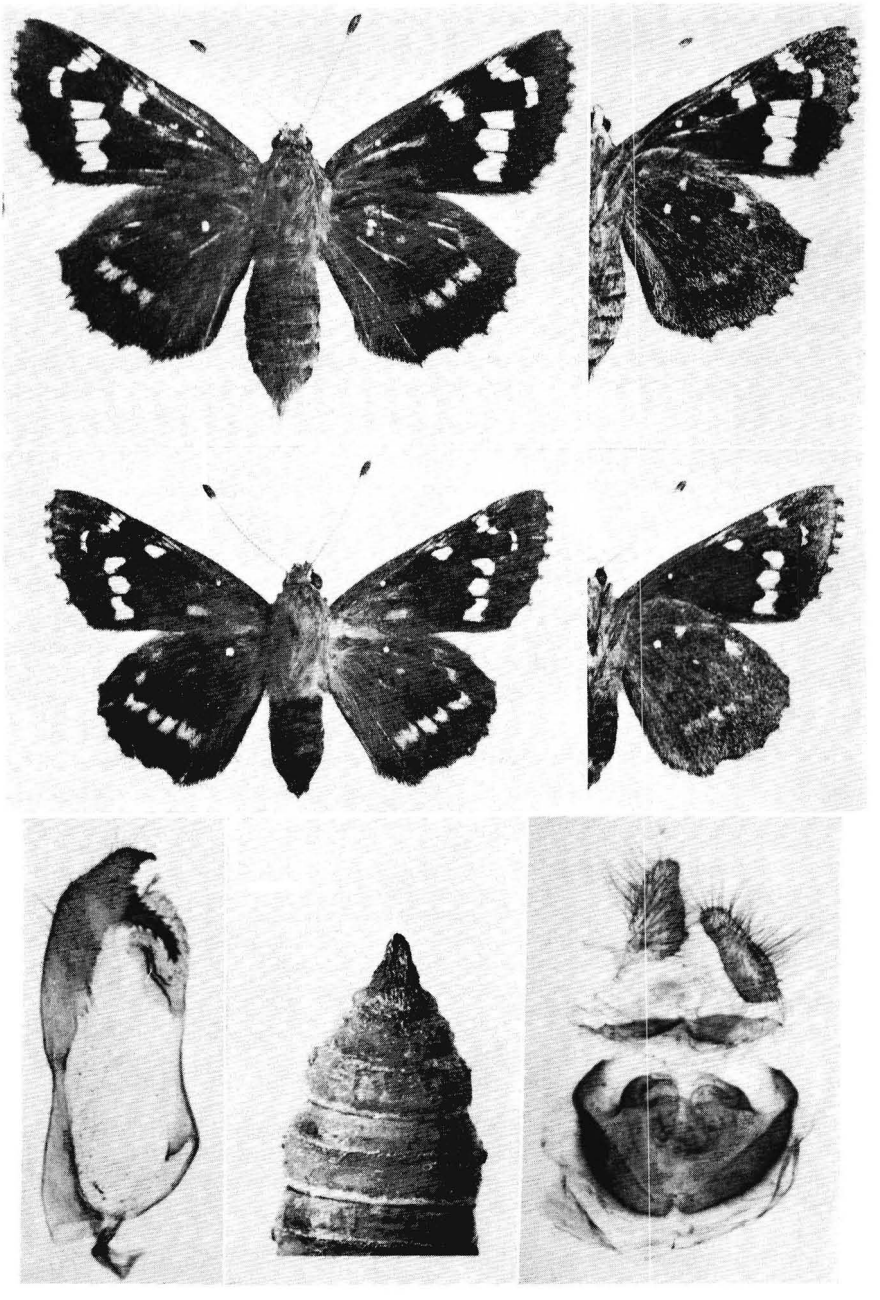

Abdomen: brown to black above with white overscaling beneath. Thorax: brown-black with golden brown overscaling above and white overscaling beneath. Palpus: white with numerous black hairs. Antenna: smoky black with narrow white rings.

Length of forewing: 22 mm to 26.5 mm; average 25 mm, measurements of holotype: forewing, apex to base 26.5 mm, apex to outer angle 16 mm, outer angle to base 19 mm; hindwing, base to end of vein Cu_1 19 mm.

Male. Upper surface of primaries: black, otherwise similar to female, except spots smaller, the lower patch of color more distinct, the upper patch very indistinct; with spot 8 round.

Undersurface of primaries: similar to female, except spot 3 also white.

Upper surface of secondaries: similar to female, spots of discal band brighter.

Undersurface of secondaries: similar to female, discal band more clearly defined by white overscaling.

Abdomen, thorax, palpus, and antenna similar to female.

Length of forewing: 22 mm to 24.5 mm, average 24 mm. Measurements of allotype: forewing, apex to base 24.5 mm, apex to outer angle 14.5 mm, outer angle to base 17 mm; hindwing, base to end of vein Cu_1 17.5 mm.

Holotype, female, allotype male, and 21 paratypes (13 males and 10 females), near Tepeaca, Puebla, Mexico, on Hwy. 150 at Km 165, elevation 7,000 ft, collected as larvae, emerging from Sept. 10 to Oct. 5, 1964. Collected by Mrs. R. C. Turner; Dr. and Mrs. J. R. Turner, Judy, Gayle, and J. R., Jr.; Mary Lee Turner; H. A. Freeman; Mr. and Mrs. Don B. Stallings.

Holotype, female, Sept. 27, 1964 and allotype, male, Sept. 25, 1964, will be deposited in the Peabody Museum of Natural History, Yale University; 13 paratypes are in the collection of H. A. Freeman and the remainder in the collection of the authors.

Specimens 30 km southeast of the type locality appear typical, but specimens 62 km southeast of type locality are not typical.

Foodplant: a large "Maguey" type of *Agave*; the leaves are yellow green, very broad and thin on the outer part, rather succulent, the plant has a very rosette shape with the bloom stalk being paniculate.

When collected the larvae were dull white with a few fine red-brown speckles, this was probably the next to last instar as later they were a light olive green color. Nearly all the larvae were found in very small plants, less than 18 inches high. The trapdoors were located on the underside of the leaves, and the leaves occupied were located more to

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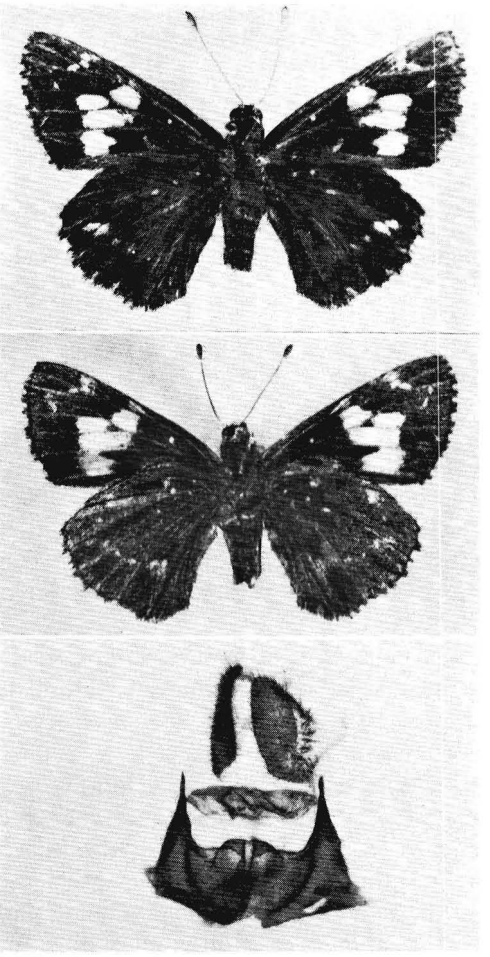
EXPLANATION OF PLATE I

Agathymus ricei Stallings, Turner, and Stallings. Top row: Holotype female, Tepeaca, Puebla, Mexico, 27 September 1964; left, upperside; right, underside. Middle row: Allotype male, Tepeaca, Mex., 25 September 1964; left, upperside; right, underside. Bottom row: left, male valva, inner aspect; middle, posterior segments of pupa including cremaster; right, external genital structures of female, abdominal segments VIII–X, ventral aspect.



EXPLANATION OF PLATE II

Agathymus escalantei Stallings, Turner, and Stallings. Holotype female, Nochistlan, Guerrero, Mexico, May, 1958. Top: Upperside. Middle: Underside. Bottom: External genital structures, abdominal segments VIII–X, ventral aspect.

the center of the plant. The collecting area was at the base of a limestone hill. Very few larvae were found upon the hill.

We realized when we first saw the trapdoors that this species was related to *Agathymus evansi* (Freeman) and *Agathymus belli* (Freeman) for they were shiny jet black. However these trapdoors were somewhat different from those of *evansi* and *belli* in that the outer two-

thirds had a frosted effect, this frosted effect results from the incorporation of a whitish substance into the outer area leaving only the inner third shiny like *evansi* and *belli*. We note that the trapdoor of *evansi* has a slight indication of the incorporation of a lighter colored substance in the outer portion of the trapdoor. The trapdoor of this new species is round, 7 mm in diameter; the trapdoor of *evansi* is round, 8 mm in diameter; while the trapdoor of *belli* is oval, 9 by 10 mm.

This species must have some green in the flat black ground color, for on both undersurfaces the white overscales appear to be greenish.

The species is readily distinguished from both *evansi* and *belli* by its darker color, smaller spots and particularly spot 8 which is round in the male, and has the inner side convex in the female. In *evansi* and *belli* the spot is rectangular and in the female the inner side of the spot is concave.

Strangely, the genitalia appears closer to *evansi* than *belli*. The cremaster of the pupa case is shorter and more blunt than *evansi* or *belli*.

The larval cavity in the plant varies from 42 mm to 51 mm in the female and from 37 mm to 58 mm in the male. The larva places a few strands of silk across the cavity immediately below where it pupates.

Named for J. E. Rice Turner, Jr., the son of the second named author, who collected part of the type series.

Agathymus escalantei Stallings, Turner, & Stallings, new species

Female. Upper surface of primaries: dark brownish black with very few yellow hairs and scales at base, extending outward along costal edge and from base towards outer angle; spots creamy lemon-yellow; spot 1 longer than wide, with the outer edge rounded; spots 2, 3, and 4 rectangular, spot 4 somewhat broader; spot 5 absent and spot 6 a minute dot well outside the discal band; discal band, with spots 7 and 8 forming a straight line on their outer edges, with spot 9 set outward appearing disassociated from 7 and 8; spot 9 distinctly toothed inwardly, spot 8 nearly twice as long as spots 7 and 9, extending inward to inner edge of cell spot; spots 1, 7, 8, and 9 separated by only narrow lines of dark brownish black; spots 1, 7, and 8 appear to form a cluster of spots unlike any other *Agathymus*; fringes are checkered dark brownish black and smoky white.

Undersurface of primaries: dull brownish black, apex lightly overscaled with white; all spots of upper surface, plus spot 5, present; spots 2, 3, 4, 5, and 6 white, 1, 7, 8, and 9 as above, larger, particularly spot 9.

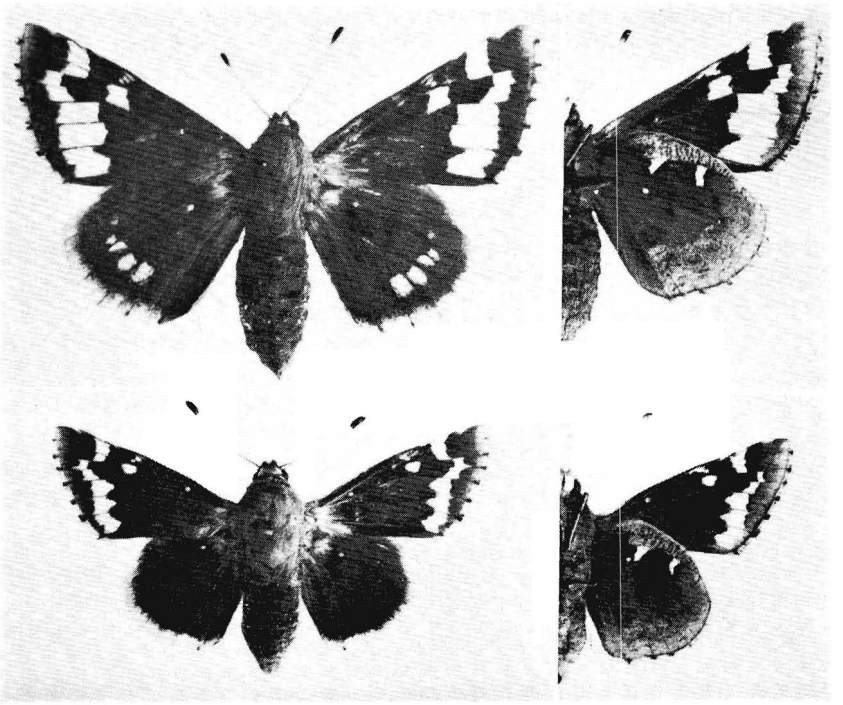
Upper surface of secondaries: dark brownish black with numerous yellow hairs at base and in anal area; discal band composed of four spots in a straight line, the upper two very distinct, the lower two, minute dots; fringes checkered like primaries.

Undersurface of secondaries: dull brownish black with white overscaling; discal band white, the more distinct spots appearing at lower edge of the band; one white comma-like spot inward in costal area.

Abdomen: dark brownish black above and brownish black below. Thorax: dark brownish black. Palpus: white. Antenna: dark brown with narrow white rings.

Measurements of holotype: forewing, apex to base 24 mm, apex to outer angle 15 mm, outer angle to base 18 mm; hindwing, base to end of vein Cu_1 18 mm.

Male. Unknown.



EXPLANATION OF PLATE III

Megathymus yuccae maudae Stallings, Turner, and Stallings. Top row: Holotype female, 21 mi. N Essex, San Bernardino Co., Calif., 9 March 1953; left, upperside; right, underside. Bottom row: Allotype male, 21 mi. N Essex, Calif., 14 March 1953; left, upperside; right, underside.

Holotype, female, Nochistlan, 20 km southwest of Acahuizetla, Guerrero, Mexico, May, 1958; deposited in collection of Tarsicio Escalante, Mexico, D.F.

The closest presently known species to this new species is *Agathymus fieldi* Freeman. It is distinguished from *fieldi* by the darker ground color, the lighter spots, which are much larger in the primaries and much smaller in the secondaries and particularly by the peculiar clustering of spots 1, 7, and 8. The wings of this species appear more fragile (thinner) than other species in the genus.

The genitalia are distinctly different, particularly in the elongated spur on each side of the sterigmal "plate."

This unique species is named for our good friend and fellow collector, Dr. Tarsicio Escalante of Mexico City.

Megathymus yuccae maudae Stallings, Turner, & Stallings, new subspecies

Female. Upper surface of primaries: black with a few yellow-green hairs near base; apex slightly overscaled with white; spot 1 rectangular, each corner extended outward slightly; spots 2, 3, and 4 of equal length; spots 5 and 6 rectangular, particularly spot 6; spots 7 and 8 about equal in size, broadly rectangular; spot 9 equal to 7 and 8, toothed inwardly, notched outwardly; spots 1, 7, 8, and 9 light yellow, spots 5 and 6 creamy yellow, spots 2 and 3 white, spot 4 white with a tinge of yellow; fringes checkered white with black.

Undersurface of primaries: black, outer margin overscaled with white, all spots of the upperside reappear, spots 2, 3, and 4 white, spots 1, 5, 6, 7, 8, and 9 creamy white, white portion of checkered fringe with a row of blackish scales half as long as the white scales.

Upper surface of secondaries: black with very few yellow-green hairs near base; light yellow spots of discal band, a minute dot with two small triangular spots below, followed by two well-defined roundish spots, inward side of latter four spots forming a straight line; broad creamy yellow margin; fringes white.

Undersurface of secondaries: black with costal area and outer margin overscaled with white; two triangular white spots in costal area, discal band indicated by slight mottling.

Abdomen: black above, dark gray to black below. Thorax: gray with greenish tinge above, darker below. Palpus: white with a few scales capped with black. Antenna: club above and below black, shaft ringed with white and black.

Length of forewing 29 mm to 33 mm, average 32 mm. Measurements of holotype: forewing, apex to base 32.5 mm, apex to outer angle 21 mm, outer angle to base 23.5 mm; hindwing, base to end of vein Cu_1 24 mm.

Male. Upper surface of primaries: black, similar to female with spots smaller and lighter in color; spots 7, 8, and 9 toothed inwardly.

Undersurface of primaries: similar to female with spots smaller, spots 2, 3, and 4 white, spots 1, 5, 6, 7, 8, and 9 creamy white.

Upper surface of secondaries: black with broad, creamy yellow margin.

Undersurface of secondaries: black, overscaled with white with two white triangular spots in costal area.

Abdomen, thorax, palpus and antenna same as in female.

Length of forewing 25 mm to 29 mm, average 27 mm; measurements of allotype: forewing, apex to base 28 mm, apex to outer angle 17 mm, outer angle to base 19 mm; hindwing, base to end of vein Cu_1 18.5 mm.

Holotype, female, and allotype, male: California, San Bernardino County, 21 miles north of Essex, on Cima Road in Providence Mountains. Described from 40 specimens (20 ♂♂ and 20 ♀♀), collected in the pupal stage by Dr. and Mrs. R. C. Turner emerging in confinement from 4 March 1953 to 17 March 1953. Holotype, female, 9 March 1953, and allotype, male, 14 March 1953, will be deposited in Peabody Natural History Museum, Yale University; paratypes are in the collection of C. L. Remington, H. A. Freeman, U. S. National Museum, and American Museum of Natural History.

Foodplant: *Yucca schidigera* (Roezl.) Ortgies.

This subspecies occurs in the Providence Mountains and northward in nearby Mojave Desert areas of eastern California. We have specimens

EXPLANATION OF PLATE IV

Megathymus yuccae elidaensis Stallings, Turner, and Stallings. Top row: Holotype female, Elida, Roosevelt Co., New Mexico, 9 April 1956; left, upperside; right, underside. Bottom row: Allotype male, Elida, N. M., 3 April 1956; left, upperside; right, underside.

from 17 miles east of Essex, in the Piute Mountains, and from the Soda Mountains near Baker.

This subspecies appears similar to *M. yuccae arizonae* Tinkham; however, the genitalia indicate that *maudae* is associated with *M. yuccae martini* Stallings & Turner. The new race is distinguished from *arizonae* by the length of the spots (longer) and the lighter color of the spots, and from *martini* by the larger spots, particularly in the female.

It is named for Maude Remington, the wife of P. S. Remington and mother of C. L. Remington; her charm is unforgettable.

Megathymus yuccae elidaensis Stallings, Turner, & Stallings, new subspecies

Female. Upper surface of primaries: deep brown-black with a few yellow hairs near base; a slight line of white overscaling from apex along outer margin; spot 1

rectangular; spot 2 nearly twice as wide as spots 3 and 4, extending outward; spots 5 and 6 roughly rectangular; spot 7 slightly shorter than spot 8; spot 8 slightly toothed inwardly; spot 9 as large as spot 8, with a toothed effect inwardly and a notched effect outwardly; spots 1, 7, 8, and 9 yellow, spots 5 and 6 light yellow, spots 2, 3, and 4 white; fringes checkered dark smoke- and brown-black.

Undersurface of primaries: brown-black, outer margin overscaled with white, all spots of upperside reappear, spots 2, 3, and 4 white, spots 5 and 6 yellow-white, spots 1, 7, 8, and 9 light yellow.

Upper surface of secondaries: deep brown-black, a few yellow hairs near base; yellow spots of discal band of two triangular spots, joined by two well-defined, squarish spots below, line formed by inward side of these four spots irregular; broad, light yellow margin, fringe white, showing a tint of yellow.

Undersurface of secondaries: brown-black, costal area and outer margin overscaled with white; two narrow, triangular, white spots located in costal area, discal band indicated by faint mottling.

Abdomen: deep brown-black above, brownish below. Thorax: gray-brown with yellow tint above, darker below. Palpus: white, a few scales capped with black. Antenna: club, above and below, black; shaft white ringed with faint brown-black.

Length of forewing 30 mm to 36 mm, average 34 mm. Measurements of holotype: forewing, apex to base 35 mm, apex to outer angle 21.5 mm, outer angle to base 24.5 mm; hindwing, base to end of vein Cu_1 23.5 mm.

Male. Upper surface of primaries: similar to female, spots smaller; spots 2, 3, and 4 white, spots 1, 5, and 6 white with considerable yellow scaling, spots 7, 8, and 9 light yellow; spots 5 and 6 each a crescent outwardly, spots 7, 8, and 9 slightly toothed inwardly.

Undersurface of primaries: similar to female with spots smaller; spots colored as above except a little lighter.

Upper surface of secondaries: deep brown-black with broad light yellow margin, fringes white with a slight tint of yellow.

Undersurface of secondaries: brown-black well overscaled with white, with two white triangular spots in costal area, there is often a minute white dot circled with brown-black in the center of the wing, if this dot is absent its location is evident from the lack of white overscaling within the brown-black circle.

Abdomen, thorax, palpus, and antenna same as in ♀.

Length of forewing 23 mm to 28 mm, average 27 mm. Measurement of Allotype: forewing, apex to base 28 mm, apex to outer angle 17 mm, outer angle to base 19 mm; hindwing, base to end of vein Cu_1 17.5 mm.

Holotype, female, and allotype, male: New Mexico, Roosevelt County, southwest of Elida. Described from 80 specimens (39 ♂♂ and 41 ♀♀), collected in the larval and pupal stage by Dr. and Mrs. R. C. Turner and Viola N. Stallings in 1956 and 1962. Specimens emerged in confinement from April 3 to May 13. Holotype, female, 9 April 1956, and allotype, male, April 3, 1956, will be deposited in Peabody Natural History Museum, Yale University. Paratypes are in the collection of C. L. Remington, H. A. Freeman, U. S. National Museum, and American Museum of Natural History.

Foodplant: *Yucca intermedia* var. *ramosa* McKelvey.

In 1956 this particular colony was located a few miles south of Elida, New Mexico on U. S. Hwy. 70 at an elevation of approximately 4,200 ft. In 1962 the colony was found 17 miles northeast of Elida, some 8 miles

southwest of Portales. The shifting of the location of the colony can be attributed to the wind. This subspecies occurs in a relative open country and the direction of the blowing wind during the flight period of the females will determine the location of the colony the following year as the females tend to drift with the wind as they oviposit. Thus we can expect colonies of this type shifting back and forth from year to year.

This subspecies occurs on the high plains of eastern New Mexico from south of Clayton southward to north of Lovington. It should also be found immediately east in west Texas.

This subspecies appears similar to *M. yucca arizonae* Tinkham; however, the genitalia indicate it is associated with *M. yucca coloradensis* Riley.

The New Mexico race is distinguished from *arizonae* by the length of the spots (longer) and the darker color of the spots and from *coloradensis* by its larger size and darker coloring of spots. It should be noted, however, that this is one of the few instances where we appear to have a north–south cline, from typical *coloradensis* to *elidaensis*.

A REVIEW OF THE *LIMENITIS LORQUINI* COMPLEX (NYMPHALIDAE)

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The *Limenitis lorquini* complex consists of two subspecies, one form, and four aberrations, according to C. F. dos Passos' 1964 Synonymic List of Nearctic Rhopalocera (pp. 75–76). *Limenitis lorquini burrisonii* Maynard and *Limenitis lorquini burrisonii* ab. *maynardi* Field are of particular interest; the former was assigned a subspecific standing while the latter is presently treated as an aberration.

It is the intention of the authors to discuss and elucidate the categorical treatment and designations of the presently recognized entities in the *lorquini* complex.

THE SOUTHERN COMPLEX

The original description of *Limenitis lorquini lorquini* (Boisduval) (Figs. 1 and 2) appeared in 1852 (Annales de la Société Entomologique de France, (2)10: 301). The type locality was cited as California. *L. l. lorquini* represents the typical, southern race of the species.

Limenitis lorquini form *eavesii*, Henry Edwards (Figs. 3 and 4), described from the vicinity of Virginia City, Nevada, differs basically