

FOUR NEW SPECIES OF *AGATHYMUS* FROM TEXAS
(MEGATHYMIDAE)

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I, as well as Stallings & Turner, have know for several years that there were several species mixed in material we have been calling *Agathymus mariae* (B. & B.) in Texas. During the past six years I have been making a detailed study of that particular species complex. In working with this problem I used 32 locations in Texas and one in New Mexico and these constitute the known range of this species complex in the United States. As *Agave lecheguilla* Torr. is the known food plant of members of this complex their range can be followed by checking the range of the food plant.

In making a study of the various habitats, the following information on each was carefully noted: location, date, plant associates, type of soil, pH of the soil at the feeding level of the plant, elevation, average annual rainfall and the presence or absence of radiation. One of the most significant factors was the isolation of certain areas from the main gene pool of *mariae*. Another appeared to be the pH factor which seemed to have an influence on the presence or absence of various species in a given habitat. Typical *mariae* is distinctly associated with alkaline soil where the average is just below 8. In the area around Del Rio, Juno and Bracketville in Texas the reading is 7 or just slightly above, indicating near neutral or neutral soil. In the Chinati mountains the pH was around 7.4. In the area 10 miles west of Lajita, where a new species was located, the pH was 7.3. Since radiation has been used to bring about production of mutant genes, I thought that by checking radiation in the various locations with a Geiger counter some answer might present itself concerning individual variation in the various habitats, however there was not sufficient radiation recorded in any of the habitats to warrant such results.

As we are uncertain as to which made its appearance first, the host or the parasite, it is a little difficult to determine just when the prototype of our present *mariae* complex appeared. Indications are that *Agave lecheguilla* once covered the entire area from the Edwards Plateau to El Paso; however many factors have accounted for its disappearance in many places, producing desert and mountain islands. In its eastern range, especially around Juno, Del Rio and north of Bracketville the plants do not appear to be typical *lecheguilla*, and the colonies of plants

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are very local, indicating that they have been isolated from typical *lecheguilla* for many years. This polytypy may have some bearing on differences exhibited by members of the *mariae* complex found in this section of the state, as they have evolved sufficiently to represent separate species, differing from typical *mariae* found over most of western Texas. In the Chinati Mountains, Presidio Co., we have a similar situation, since this area apparently has been cut off from the main gene pool of *mariae* for many years, and isolation and other factors have resulted in the formation of a new species, the description of which follows.

AGATHYMUS CHINATIENSIS Freeman, NEW SPECIES

FEMALE. Upper surface of primaries: dark gray, with a heavy overscaling of ochraceous hairs and scales over the middle and basal area. Markings deep yellow: a large cell spot (spot 1), 3.5 mm wide at costa and 2 mm wide at bottom; four linear, subapical spots, averaging 1.5 mm wide; the two extradiscal spots touch outer edge of lower subapical spot and are fused together; discal band composed of three somewhat fused spots, forming a straight line down their outer surface, the one in interspace 1 (spot 9) is broad, 4-5 mm wide, pointed on its inner surface, the one in interspace 2 (spot 8) is broadly linear, 4.5 mm wide, the one in interspace 3 (spot 7) originates just beneath inner edge of lowest extradiscal spot and terminates just beneath cell spot, width 4 mm. The ochraceous overscaling terminates abruptly basad to cell spot, pure ground color between this and discal spots. Fringes alternately dark gray and light tan.

Upper surface of secondaries: ground color dark gray, overscaling heavier than on primaries, giving a somewhat golden cast to the wing. Markings deep yellow: a well defined spot half way between discal band and base, with a smaller spot slightly beneath and inward from it; an evenly curved discal band, composed of six spots, more or less fused together, varying width from 4 mm to .5 mm near the costal area, all except costal spot wide and well defined. Fringes alternately gray and sordid yellow.

Under surface of primaries: dark gray, heavily overscaled with lighter gray scales, especially near apical area. All spots reappear, lighter in coloration.

Under surface of secondaries: dark gray ground color heavily overscaled with steel-gray scales. All spots reappear yellowish-white, in marked contrast with ground color.

Thorax above grayish-brown, lighter gray beneath. Abdomen with first three segments above of same coloration as thorax, remainder grayish; beneath lighter gray, like thorax. Palpi sordid white. Legs same color as under side of thorax and abdomen. Antennae sordid white with black rings, basal third of club sordid white, remainder black.

Wing measurements. Holotype female, primaries: base to apex, 26 mm; apex to outer angle, 16 mm; outer angle to base, 15 mm; secondaries: base to end of Cu_1 , 19 mm; costa to anal angle, 14 mm; total expanse, 52 mm. (average of the paratypes, 54 mm).

MALE. Upper surface of primaries: grayish-black, with considerable yellowish-gray scales near the base. Markings deep ochreous yellow: a spot at end of cell 2.5 mm long; the three subapical spots linear, well-defined, the one in interspace 6 (spot 4) out of line towards apex; the two extradiscal spots well defined, not touching subapical or discal spots; discal band composed of three separated spots, which are in line, the one in interspace 1 broadly columnar, 2.5 mm wide in center, the one in interspace 2 is broad, 4 mm wide, rounded on outside, pointed on inside towards base, the one in interspace 3 straight on outside, pointed on top inside toward cell spot, 3 mm wide. Fringes alternately gray and sordid white.

Upper surface of secondaries: grayish-black, sparsely overscaled with ochraceous-yellow hairs and scales. Markings deep ochreous yellow: a spot two-thirds of the way towards base from discal spots and the slightest indication of another one slightly beneath and inward from first; a curved discal band of five spots, which varies in width from 2 mm to .8 mm, with the upper spot being out of line inward. Fringes alternately gray and sordid yellow.

Under surface of primaries: dark grayish-black, with lighter gray overscaling over apical area and between cell spot and subapical spots. All spots reappear and are lighter in coloration.

Under surface of secondaries: ground color grayish-black, with lighter gray overscaling. A white subcostal spot and all other spots reappear from above, sordid white, giving wing a mottled appearance.

Thorax, abdomen, palpi, legs and antennae same as in female. Wing measurements. Allotype male, primaries: base to apex, 26 mm; apex to outer angle, 15 mm; outer angle to base, 19 mm; secondaries: base to end of Cu_1 , 18 mm; costa to anal angle, 15 mm; total expanse, 55 mm. (average of the paratypes, 50 mm.).

HOLOTYPE female, 2.7 miles south of Shafter, Texas, 5 October 1960, reared in *Agave lecheguilla* Torr.; allotype male, same location and food plant, 15 October 1960; both were collected by the author and will be deposited in the American Museum of Natural History. Described from 31 specimens (17 males and 14 females collected in the larval stage by the author at the following locations in Texas: 2.7 miles south Shafter, Presidio Co., el. 4000 feet, pH 7.1 (type locality), 9♂♂ 9♀♀, emerged September and October, 1960-61; Chinati Mountains, el. 4350 feet, pH 7.4, 5♂♂, 2♀♀, emerged September and October 1960; 19 miles south Marfa, el. 5200 feet, pH 7.3, 3♂♂, 3♀♀, emerged during October 1957. One pair of paratypes will be placed in each of the following collections: Yale University, American Museum of Natural History, and Stallings and Turner. The rest of the paratypes are in the collection of the author. This species is named for the mountains where it occurs.

In comparing *chinatiensis* with *mariae* there are a number of differences that can easily be detected. In the males all spots are larger and somewhat differently shaped from those in *mariae*, especially spots 7, 8, and 9, which are all of about the same width, while in *mariae* they progressively increase in size with 9 being the largest. The ground color is dull grayish-black in *chinatiensis*, while in *mariae* there is a brownish overcast. On the lower surface of the secondaries there is more contrast between the light and dark areas in *chinatiensis* than there is in *mariae*. In the females the same differences are noted as in the male as both sexes exhibit a greater contrast between the maculation and the ground color than does *mariae*. The maculation in *chinatiensis* has a little more orange in it than does *mariae*. Genitalic differences can be noted on plate 3. The pupal cremasters show some differences which are shown on plate 3.

The food plant is *Agave lecheguilla* Torr. The type locality is near highway 67, 2.7 miles south of Shafter, Texas. It is mountainous, el.

4000 feet, with outcroppings of limestone and extremely rocky, pH 7.1; plant associates are catclaw and scrub cedars. The larvae are bright blue similar to *mariae*, and they feed on the leaves of *lecheguilla* and penetrate to a depth of 16 mm. into the caudex. Larvae of *mariae* seldom go more than 4-5 mm into the caudex, with their tunnel being from 65-70 mm in length; while the length of *chinatiensis* tunnels varies from 71-82 mm. The trap door occurs on the upper side of the leaf well up from the base.

Ten miles west of Lajita, Texas. in Presidio Co., a small colony of *Agathymus* was found that possibly represents an unnamed Mexican species which just barely enters Texas in this one area. South of the Rio Grande just below this region, there are rugged mountains, well covered with *lecheguilla*, and so far they have never been collected for Megathyridae. The description of this new species follows.

AGATHYMUS LAJITAENSIS Freeman, NEW SPECIES

FEMALE. Upper surface of primaries: dark gray, with a slight overscaling of fulvous near base. Markings tan: an indistinct light spot two thirds the distance towards base; cell spot of two linear spots fused together, the upper one displaced slightly inward, 3 mm wide; four broad, linear, subapical spots, fused together forming a band that angles out at bottom to touch upper large extradiscal spot, all spots about 2.5 mm wide; discal band of three separate, spots, the one in interspace 3 pointed on outside and inside, broad, 4 mm, extending from just beneath lowest extradiscal spot just to under edge of cell spot, the one in interspace 2 rounded on its outer surface and straight on inner surface, 5 mm wide, the one in interspace 1 straight on outer surface and bluntly pointed on inner surface, toward base, 6 mm wide. Fringes light tan with slight indication of darker gray checkering.

Upper surface of secondaries: same dark gray color as primaries, with slightest indication of grayish overscaling near base. Markings tan: a well defined spot near center of wing and sometimes another, smaller, spot beneath first; discal band evenly curved, of five separate, well defined spots, the one near anal angle squarish, 3 mm wide, the next one indistinctly pointed at bottom, 2 mm wide, the next one sharply pointed outward, 1 mm wide, the next one somewhat rounded, 3 mm wide, above fourth one a triangular spot 1 mm wide. Fringes grayish-tan with the slightest indication of darker checkering.

Under surface of primaries: grayish-black, with some lighter grayish overscaling at apex. All spots reappear, only slightly lighter in color than on upper side.

Under surface of secondaries: dark gray, rather sparsely overlaid with light gray scales. Discal band reappears, white; a white spot near center of wing and a white subcostal spot. A darker area between center spot and discal band, giving wing a mottled appearance.

Thorax brownish-black above, gray beneath. Abdomen of the same color as thorax. Palpi light gray. Legs same color as under side of thorax. Antennae gray, ringed with black, club having basal third gray, remainder black.

Wing measurements. Holotype female, primaries: base to apex, 26 mm; apex to outer angle, 16 mm; outer angle to base. 20 mm; secondaries: base to end of Cu_1 , 20 mm; costa to anal angle, 15 mm; total expanse, 53 mm (average of the paratypes, 53 mm).

MALE. Upper surface of primaries: black with a slight purplish overcast, some fulvous overscaling near base forming an indistinct spot two thirds the distance in towards base of wing. Markings orange-brown: cell spot is small and rounded;

three subapical spots, the lowest one out of line outward; the two extradiscal spots small and round, placed outward from subapical spots; discal band composed of three widely separated spots, the one in interspace 3 broad, 2.5 mm, pointing towards cell spot, the one in interspace 2 more rounded, of the same width, the one in interspace 1 broadly L-shaped, of the same width. Fringes gray showing only the slightest indication of checkering.

Upper surface of secondaries: same coloration as primaries. A distinct spot near center of wing; discal band evenly curved, made up of five separate spots; the one near anal angle 2.5 mm wide, the next one 1.5 mm, the next .5 mm, the next linear, 2.5 mm long, the last one is above the linear spot, slightly oval, .5 mm wide. Fringes alternately gray and light tan.

Under surface of primaries: black, with some lighter gray overscaling near apex. All spots reappear, lighter in coloration.

Under surface of secondaries: ground color dark gray, rather sparsely overscaled with light gray, giving the wing a rather blotched appearance. Two sordid white, subcostal spots; a light gray area from near the center of wing to base, discal band light, leaving a darker area between these two regions.

Thorax, abdomen, palpi, legs and antennae same as in female.

Wing measurements. Allotype male, primaries: base to apex, 25 mm; apex to outer angle, 14 mm; outer angle to base, 19.5 mm; secondaries: base to end of Cu_1 , 19.5 mm; costa to anal angle, 13 mm; total expanse, 52 mm (average of the paratypes, 52 mm).

HOLOTYPE female, 10 miles west of Lajita, Texas, 2 October 1961, reared in *Agave lecheguilla* Torr.; allotype male, same location and food plant, 8 October 1962; both were collected by the author and will be deposited in the American Museum of Natural History. Described from 21 specimens (11 males and 10 females). All specimens were collected by the author in the larval stage 10 miles west of Lajita, Presidio Co., Texas, el. 2650 feet, soil pH 7.3. These emerged during September and October 1961-62. One pair of paratypes will be placed in each of the following collections: Yale University, American Museum of Natural History and Stallings & Turner. The rest of the paratypes are in the collection of the author. This species is named for the area where it was collected.

In comparing *lajitaensis* with *mariae* and *chinatiensis*, the ground color is dull black, whereas in the latter two the ground color is more brownish-black. The males of *lajitaensis* have the spots reduced somewhat in size, especially on the secondaries. On the lower surface of the secondaries the spots reappear and some are clear white, thus showing a marked contrast with the ground color. The fringes are lighter in *lajitaensis*, being yellowish white, while in *mariae* and *chinatiensis* they are more yellowish-tan. In the females there is a tendency for the discal band on the upper surface of the secondaries to be made up of distinct spots, while in *mariae* and *chinatiensis* these spots tend to be fused together. The discal band reappears on the lower surface of the secondaries and is often clear white, producing a distinct contrast with the dark gray ground color. In *mariae* the ground color of this area is much lighter and the discal band is more ochraceous. In *chinatiensis* the

ground color is even lighter than in *mariae*, with the discal band light yellowish-tan and contrasting sharply with the ground color. The color of the spots in both sexes is very similar to that of *mariae*. Genitalic and cremaster differences can be noted on plate 3.

The food plant is *Agave lecheguilla* Torr. The type locality is 10 miles west of Lajita, Texas, in Presidio Co., near highway 170. This is in a valley, el. 2650 feet, surrounded by rugged mountains. The soil is very rocky and grayish in color, pH 7.3. Plant associates are sotol, ocotillo, scattered *Yucca torreyi* Shafer and many cacti. The larvae are lighter blue than *mariae* and they feed primarily on the leaves, only penetrating the caudex to a depth of 14 mm. The tunnel length varies from 80-82 mm with the trap door well up on the upper side of the leaf.

There is a very interesting area in Texas extending from Boquillas Canyon up to just west of Dryden and over through Langtry and Del Rio to 14 miles north of Bracketville. Evolution has taken place resulting in the presence of three species in parts of this area. The description of one of these new species follows.

AGATHYMUS GILBERTI Freeman, NEW SPECIES

FEMALE. Upper surface of primaries: grayish black, basal third of wing overlaid with yellowish-gray scales and hairs. Markings yellowish-tan: cell spot large, three minute, linear spots above it, width of cell spot 2-3 mm; four linear, subapical spots, average width 1.5 mm; the two extradiscal spots well defined; discal band composed of three separate spots, the one in interspace 3 broadly oval, lying midway between cell spot and lowest extradiscal spot, 3-4 mm wide, the one in interspace 2 rectangular, 4 mm wide, the one in interspace 1 broad, 5 mm, straight on outer surface and sharply pointed toward base on inner side; all three spots form a more or less straight line down their outer surfaces, located inward from lowest extradiscal spot, about a third the way in from outer margin of wing. Fringes alternately dark and light gray.

Upper surface of secondaries: grayish black, with some golden hairs and scales forming a light overscaling over wing, especially near base. Markings yellowish-tan: a lighter area near center of distance between discal band and base of wing, which varies from two indistinct spots to a narrow line; discal band composed of six well defined spots, the first four from anal angle outward, form a straight line, the fifth one located almost directly above fourth, sixth inward from fifth and just below costal area; first and fourth discal spots large, 2 mm wide, third small and somewhat oval, 1 mm wide. Fringes alternately white and gray.

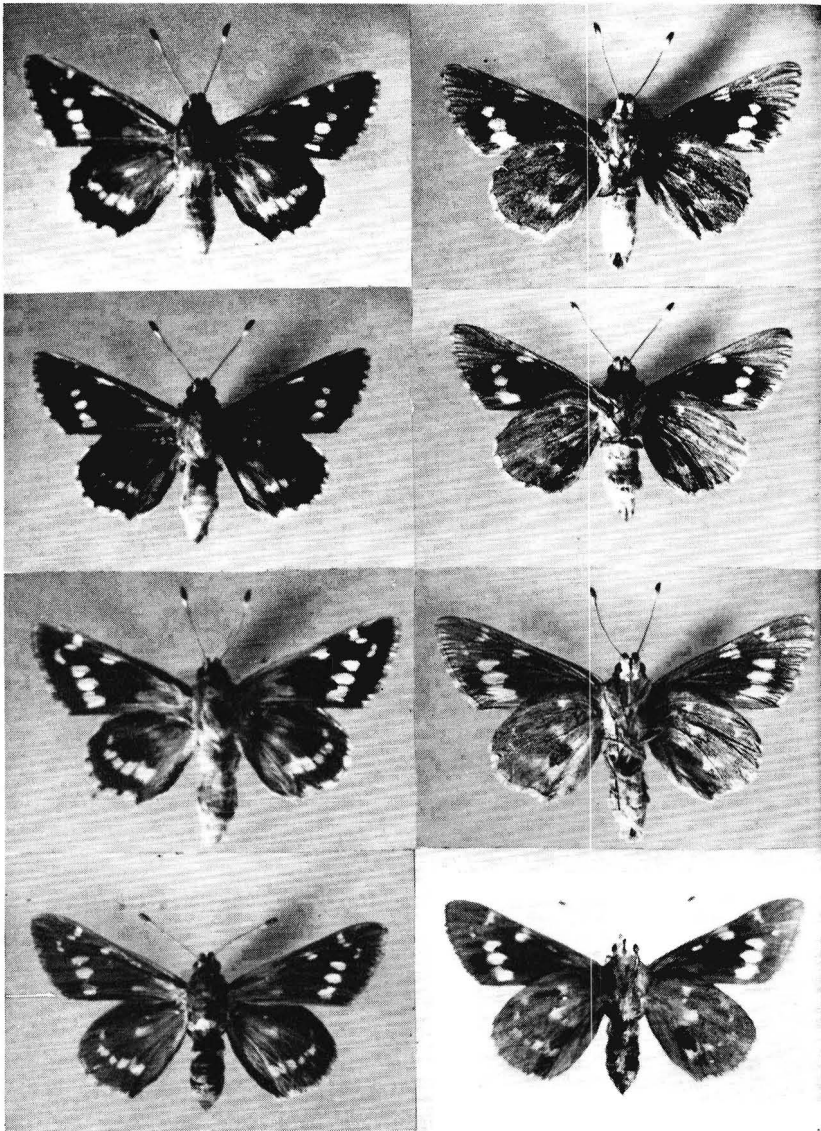
Under surface of primaries: grayish brown, with apical region heavily overscaled with light, steel gray. All spots reappear, lighter than above.

Under surface of secondaries: gray, heavily overscaled with steel gray, only a slight indication of discal band in some specimens, others immaculate.

Thorax above light gray, beneath even lighter, nearly white between legs. Abdomen same color as thorax. Palpi light, sordid white. Legs light gray. Antennae gray, ringed with dark brown, club having basal third light gray, the remainder purplish-black, the tip reddish-brown.

Wing measurements. Holotype female, primaries: base to apex, 25 mm; apex to outer angle, 14.5 mm; outer angle to base, 19 mm; secondaries: base to end of Cu_1 , 18.5 mm; costa to anal angle, 15 mm; total expanse 51 mm (average of paratypes, 51 mm).

MALE. Upper surface of primaries: black, some slight grayish overscaling near apex, brown near base. Markings light yellowish-tan: a small, linear, cell spot; subapical spots variable, ranging from none to three, indistinct, linear dots; extradis-



EXPLANATION OF PLATE I

Top row: *Agathymus rindgei* Freeman ALLOTYPE ♂, 14 miles north of Bracketville, Texas, 15 Oct. 1958. 2nd row: *Agathymus gilberti* Freeman ALLOTYPE ♂, 14 miles north of Bracketville, Texas, 21 Oct. 1959. 3rd row: *Agathymus chinatiensis* Freeman ALLOTYPE ♂, 2.7 miles south of Shafter, Texas, 15 Oct. 1960. Lower row: *Agathymus lajitaensis* Freeman ALLOTYPE ♂, 10 miles west of Lajita, Texas, 8 Oct. 1962.

cal spots absent or indicated by a minute dot or two; discal band composed of three widely separated, variable spots, the one in interspace 1 rather tall and narrow, slightly wider at base than at top, 1 mm wide in middle, the spot in interspace 2 round, 1.2 mm wide, the one in interspace 3 linear, 1.5 mm wide. tan. Fringes alternately dark gray and white.

Upper surface of secondaries: black, with some light brown overscaling, especially near base. Markings a trace darker than those of primaries; some specimens show a lighter spot near base of wing; discal band normally composed of four rather indistinct spots, forming a straight line, the one near the anal angle 1 mm wide, succeeding spots progressively smaller until the last two are mere dots; in a few specimens a fifth spot present, above last two in normal discal band. Fringes alternately white and gray.

Under surface of primaries: black, with apical third of wing heavily overscaled with steel gray, some specimens with indication of a light blue cast. The cell spot well defined, sordid white; the discal spots reappear prominently, lighter than above; no indication of extradiscal spots subapical spots reappear only rarely.

Under surface of secondaries: gray, heavily overscaled with steel gray giving wing an even appearance; some specimens with a small, white, spot beneath costa and some indication of the discal band by an indistinct white area.

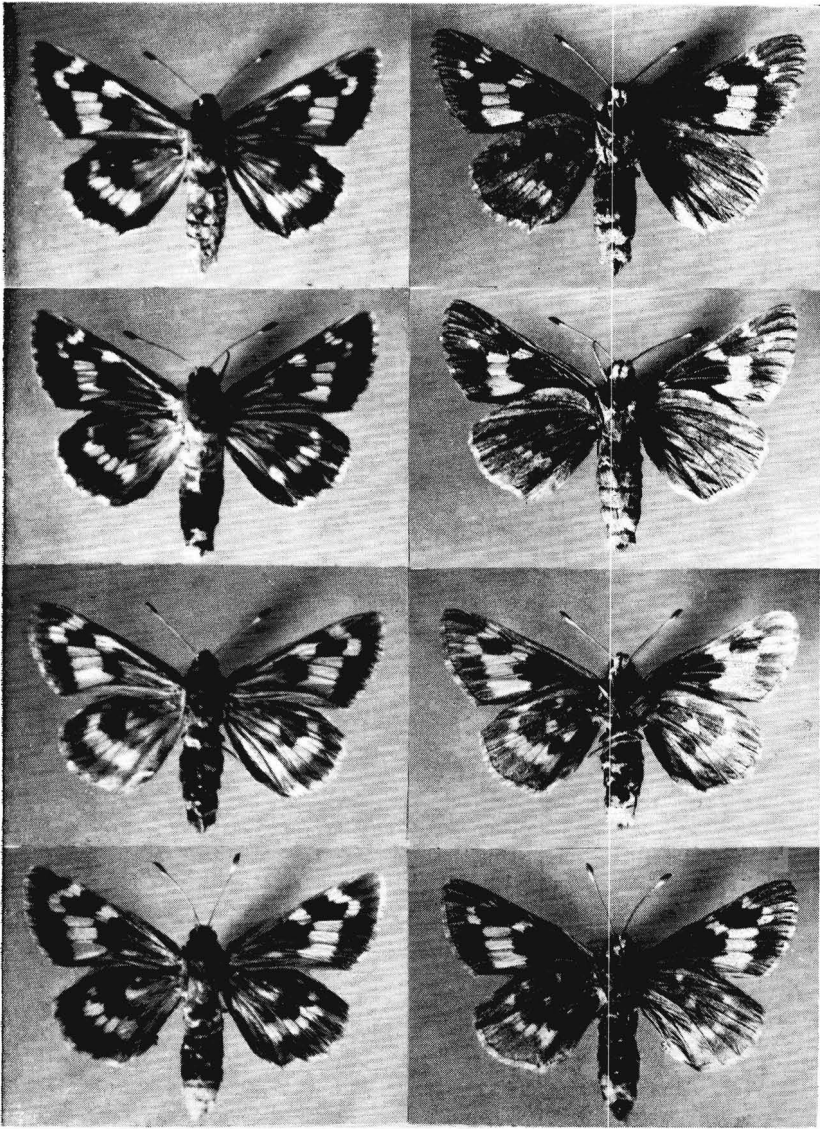
Thorax above dark gray, beneath much lighter, nearly white between legs. Abdomen dark gray above, lighter beneath. Palpi, legs and antennae same as in female.

Wing measurements. Allotype male, primaries: base to apex, 24 mm; apex to outer angle, 13 mm; outer angle to base, 18 mm; secondaries: base to end of Cu_1 , 16.5 mm; costa to anal angle, 13 mm; total expanse, 50 mm (average of the paratypes, 50 mm).

HOLOTYPE female, 14 miles north of Bracketville, Texas, 22 October 1961, reared in atypical *Agave lecheguilla*; allotype male, same location and food plant, 21 October 1959, both were collected by the author and will be deposited in The American Museum of Natural History.

Described from 120 specimens (65 males and 55 females) collected in the larval stage by Gilbert Freeman, Louise Freeman, Stallings & Turner and the author at the following locations in Texas: 14 miles north of Bracketville, Kinney Co., el. 1500 feet, pH 7.1 (type locality), 22♂♂, 20♀♀, emerged September, October, November 1959-63; 28 miles north of Del Rio, el. 1450 feet, pH 7.1, 2♂♂, 3♀♀ emerged October 1958-62; 11-12 miles south Juno, el. 1450 feet, pH 7.1, 1♂, 2♀♀, emerged October, November 1959 and 1963; Pecos River Canyon, el. 1250 feet, pH 7, 2♂♂, October 1963; 10 miles east of Langtry, el. 1150 feet, pH 7, 2♂♂, 1♀, emerged October 1963; Langtry, el. 1150 feet, pH 7, 19♂♂, 20♀♀, emerged October, November 1959-63; 8 miles west of Dryden, el. 2150 feet, pH 7.3, 11♂♂, 4♀♀, emerged September, October, November 1959-62; near Boquillas Canyon, el. 1900 feet, pH 7.2, 6♂♂, 5♀♀, emerged September, October 1961-62. One pair of paratypes will be placed in the collections of Yale University and the American Museum of Natural History. There are 4♂♂ and 6♀♀ paratypes in the Stallings & Turner collection. The rest of the paratypes are in the collection of the author. I take pleasure in naming this new species for my son Gilbert, who helped collect part of the type series.

In comparing *gilberti* with the other species in this complex it does not approach *mariae*, *chinatiensis* nor *lajitaensis*, being closer to *mi-*



EXPLANATION OF PLATE 2

Top row: *Agathymus rindgei* Freeman HOLOTYPE ♀, 14 miles north of Bracketville, Texas, 23 Oct. 1961. 2nd row: *Agathymus gilberti* Freeman HOLOTYPE ♀, 14 miles north of Bracketville, Texas, 22 Oct. 1961. 3rd row: *Agathymus chinatiensis* Freeman HOLOTYPE ♀, 2.7 miles south of Shafter, Texas, 5 Oct. 1960. Lower row: *Agathymus lajitaensis* Freeman HOLOTYPE ♀, 10 miles west of Lajita, Texas, 2 Oct. 1961.

cheneri Stallings, Turner & Stallings in many respects. The general wing shape in *gilberti* is somewhat narrower than the others, including *chinatiensis* which has rather narrow wings; and the ground color is darker black with less overscaling near the base of the wings in both sexes. Spot 1 is reduced in size as are spots 2, 3, 4 (sometimes completely absent). Spots 5, 6 are absent or very small in the males. On the lower surface of the secondaries in both sexes the ground color is heavily overscaled with steel gray scales thus giving a rather even, smooth, appearance to this area. The discal band in the males on the upper surface of the secondaries is made up of small spots which form a straight line which does not appear in any of the other described species except rarely in *micheneri*. The color of the spots is light yellowish tan in both sexes. The fringes of the males are white alternating with dark spots. In the females spots 7 and 8 are narrow and usually reduced in size. Spot 7 does not approach spot 1. Spot 9 is usually elongated inward forming a broad L, somewhat like in the males of *micheneri*. In *micheneri* the discal band on the upper surface of the secondaries is straight but the spots are never reduced in size and are large and usually fused together. The coloration of the spots in *micheneri* is more orange than in any of the other species, especially *gilberti*. The females of *micheneri* have spot 7 very wide, reaching well under spot 1, a characteristic never present in *gilberti*. Genitalic and cremaster differences of *gilberti* can be noted on plate 3.

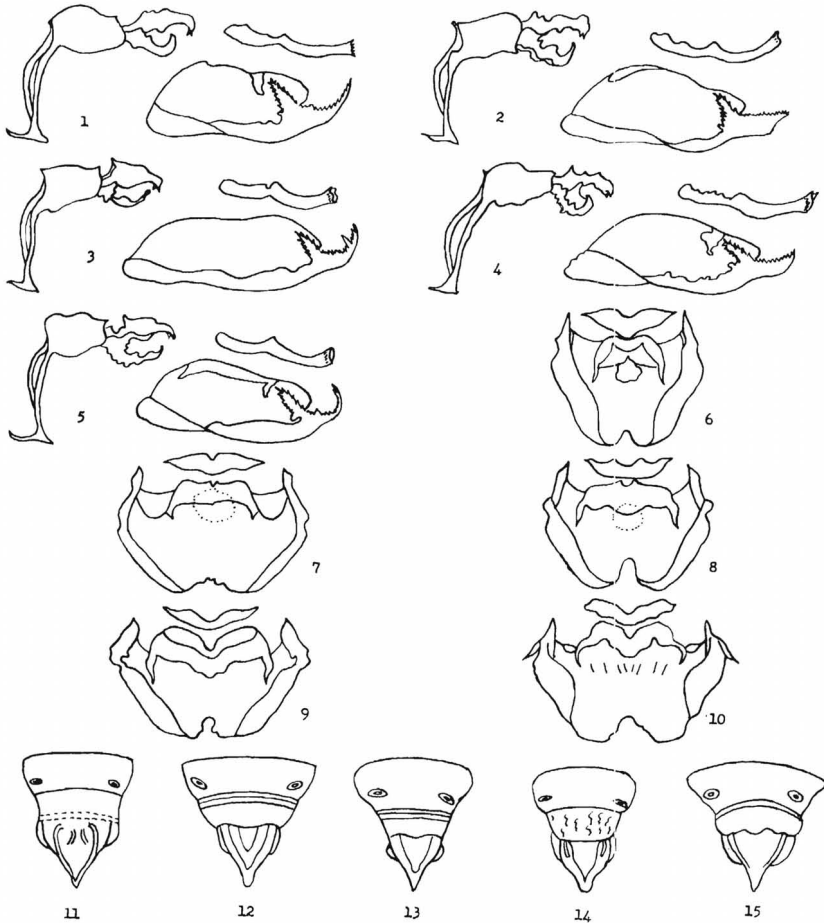
The foot plant is atypical *Agave lecheguilla*, possibly a closely related species. The type locality is 14 miles north of Bracketville, Texas, near farm road 674, in rolling hills, el. 1500 feet. The soil is very rocky and grayish in color, pH 7.1. The plant associates are *Yucca torreyi*, *Yucca thompsoniana* Trelease, cedars, *Nolina*, sotol, catclaw and mesquite. The larvae are dull, dark blue and feed on the leaves but penetrate will into the caudex of the *lecheguilla* plants, 20-30 mm. Their tunnels vary from 72-91 mm in length, and the trap door is located near the base of the leaf and on the upper side of the leaf. Sometimes feeding in the same plant will be larvae of *Agathymus estelleae* (Stallings & Turner) and the larvae of another species whose description will follow.

AGATHYMUS RINDGEI Freeman, NEW SPECIES

FEMALE. Upper surface of primaries: grayish black, with basal third of wing overscaled with yellowish-tan hairs and scales. Markings yellowish-tan: cell spot large, fusing into the three linear spots above, appearing as one large spot, 4 mm wide at top, 3 mm wide at bottom. four wide, 2 mm, linear, subapical spots; the two extradiscal spots well defined, upper one touching lower surface of last subapical spot; discal band composed of three broad, more or less fused spots, the one in interspace 3 broadly rectangular, 4 mm wide, nearly touching cell spot on its inner surface, originating just beneath lowest extradiscal spot, the one in interspace 2 broadly rectangular, 5 mm wide, the one in interspace 1 5 mm wide, pointed towards base; all spots form a straight line down their outer surfaces, located about

a fourth the distance in from outer margin of wing. Fringes alternately dark and light gray.

Upper surface of secondaries: grayish black, with some light fulvous hairs and overscaling near base of wing. Markings yellowish tan: two light, indistinct, spots near center of wing; discal band composed of six large, fused spots, the one nearest to anal angle irregularly square, 4 mm wide, the next linear, 2 mm wide, 4 mm long, the next linear, 1.5 mm wide, 2 mm long, the next made up of two fused spots, 4 mm wide, 2-3 mm. long, above this a square spot, 2 mm wide, inward toward the costa a narrow, linear, spot; whole discal band of spots slightly curved inward. Fringes alternately white and gray.



EXPLANATION OF PLATE 3

1. ♂ genitalia, *A. mariae* (B. & B.); 2. ♂ genitalia, *A. chinatiensis* Freeman; 3. ♂ genitalia, *A. lajitaensis* Freeman; 4. ♂ genitalia, *A. gilberti* Freeman; 5. ♂ genitalia, *A. rindgei* Freeman; 6. ♀ genital plate, *A. mariae* (B. & B.); 7. ♀ genital plate, *A. chinatiensis* Freeman; 8. ♀ genital plate, *A. lajitaensis* Freeman; 9. ♀ genital plate, *A. gilberti* Freeman; 10. ♀ genital plate, *A. rindgei* Freeman; 11. Cremaster, *A. mariae*; 12. Cremaster, *A. chinatiensis*; 13. Cremaster, *A. lajitaensis*; 14. Cremaster, *A. gilberti*; 15. Cremaster, *A. rindgei*.

Under surface of primaries: grayish-brown, apical region heavily overscaled with dark gray scales. All spots reappear, lighter in coloration.

Under surface of secondaries: dark gray, heavily overscaled with dark gray. Discal band reappears as a lighter area; two white spots below costa.

Thorax above grayish-brown, beneath lighter. Abdomen concolorous with thorax. Palpi light, sordid white. Legs gray. Antennae light gray, ringed with dark brown, club having basal third light gray, remainder black.

Expanse, wing measurements. Holotype female, primaries: base to apex, 26 mm; apex to outer angle, 16 mm; outer angle to base, 19 mm; secondaries: base to end of Cu_1 , 20 mm; costa to anal angle, 15.5 mm; total expanse, 53 mm (average of the paratypes, 53 mm).

MALE. Upper surface of primaries: black, some fulvous overscaling over basal area. Markings orange-yellow: a well developed, linear cell spot; subapical spots well developed; the two extradiscal spots present, not always distinct; discal band composed of three well developed spots, the one in interspace 3 somewhat broadly triangular, 2 mm wide, the spot in interspace 2 round, 3 mm wide, the one in interspace 1 broadly columnar, 3 mm wide. Fringes alternately dark gray and sordid white.

Upper surface of secondaries: black, some fulvous overscaling, becoming heavier near base. Markings orange-yellow: a light spot usually present toward base of wing; discal band composed of five well defined spots, forming a slight curve inward, the one near anal angle 3 mm wide, the next one just under 2 mm wide, the next one 1 mm wide, the next linear, 3 mm long, 1 mm wide, the last a small spot, .5 mm wide. Fringes alternately white and gray.

Under surface of primaries: black, heavily overscaled with dark gray at apex. All spots reappear, lighter in coloration.

Under surface of secondaries: gray, heavily overscaled with dark gray. An indistinct, white subcostal spot; a sordid white area near center of wing, discal band reappears as a lighter area.

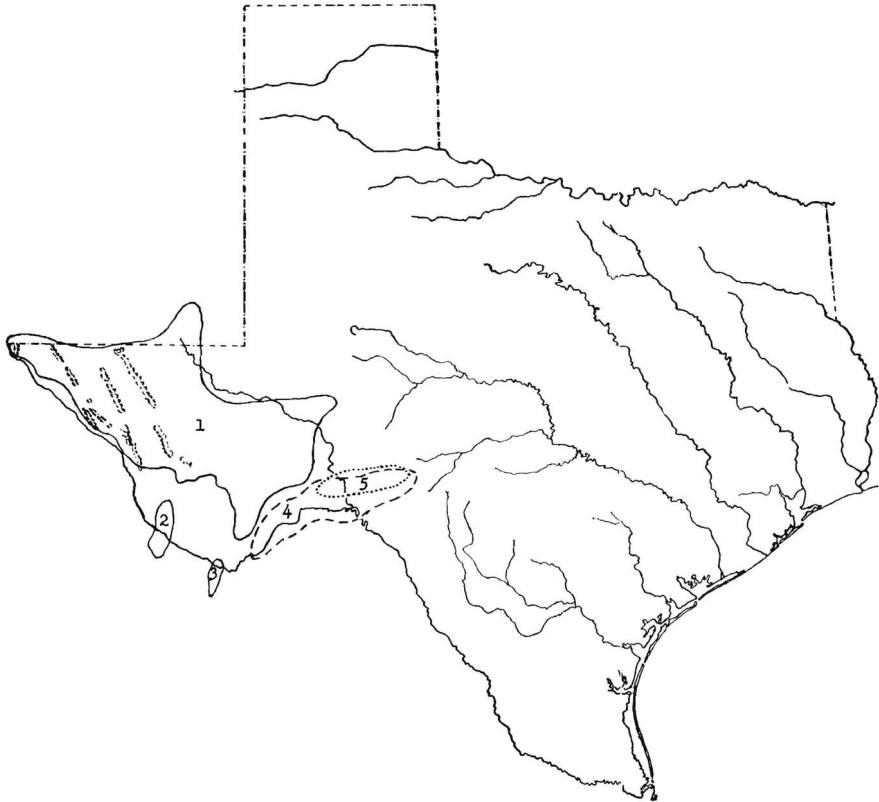
Thorax above dark gray, some fulvous hairs present, beneath lighter. Abdomen dark gray above, lighter beneath. Palpi, legs and antennae same as in female.

Wing measurements. Allotype male, primaries: base to apex, 25 mm; apex to outer angle, 15 mm; outer angle to base, 18.5 mm; secondaries: base to end of Cu_1 , 18.5 mm; costa to anal angle, 14 mm; total expanse, 52 mm (average of the paratypes, 52 mm).

HOLOTYPE female, 14 miles north of Bracketville, Texas, 23 October 1961, reared in atypical *Agave lecheguilla*; allotype male, same location and food plant, 19 October 1958, both were collected by the author and will be deposited in The American Museum of Natural History. Described from 41 specimens (17 males and 24 females); 10 specimens were collected by Stallings & Turner and the rest by the author, all in the larval stage, at the following locations in Texas: 14 miles north of Bracketville, Kinney Co., el. 1500 feet, pH 7.1 (type locality), 10♂♂, 14♀♀, emerged September, October, November 1958-63; 28 miles north of Del Rio, Val Verde Co., el. 1450 feet, pH 7-1, 5♂♂, 6♀♀, emerged September, October, November 1958-63; 11-12 miles south of Juno, el. 1450 feet, pH 7.1, 2♂♂, 4♀♀, which emerged October, 1961-63. One pair of paratypes will be placed in the collections of Yale University and the American Museum of Natural History. There are 6♂♂, 4♀♀ paratypes in the Stallings & Turner collection. The rest of the paratypes are in the collection of the author.

I take pleasure in naming this new species for Dr. F. H. Rindge of the American Museum of Natural History, who has helped me in many ways with my studies of the Megathymidae.

In comparing *rindgei* with the other species in this group, it shows similarities to both *lajitaensis* and *gilberti*. The wing shape is broader than in either *lajitaensis* or *gilberti*. The general maculation is somewhat like *lajitaensis* in both sexes, but the ground color is darker and there is much less contrast on the lower surface of the secondaries since that area is heavily overscaled with steel gray scales much like in *gilberti*. In the males spots 1 through 6 are better defined than in *gilberti* and the discal band on the upper surface of the secondaries is not straight but is evenly curved, as in *mariae*, and is much better developed. In the females



EXPLANATION OF MAP

Distributions of species of *Agathymus* in western Texas. 1, *A. mariae* (Barnes & Benjamin); 2, *A. chinatiensis* Freeman; 3, *A. lajitaensis* Freeman; 4, *A. gilberti* Freeman; 5, *A. rindgei* Freeman.

WING SHAPE COMPARISON OF THE VARIOUS SPECIES OF THE *Agathymus Mariae* COMPLEX*

	<i>mariae</i>		<i>chinatiensis</i>		<i>lajitaensis</i>		<i>gilberti</i>		<i>rindgei</i>		<i>micheneri</i>	
Primaries	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀
Base to apex	23.5	26	23.5	26	23.5	26	23.5	26	23.5	26	23.5	26
Apex to outer angle	15	17	13	15	13	16	13	15	14	16	13.5	15
Outer angle to base	16	20	16	19	18	20	18	19	18	19	18	20
Secondaries												
Base to end of Cu ₁	17.5	20	17	19	16.5	20	17	19	18	20	18	19
Costa to anal angle	15	17	13	15	13	16	13	15	14	16	14	15

*Measurements in millimeters.

(broad) (narrow) (medium) (narrow) (broad) (medium)

all spots are larger than in *gilberti* and the discal band reappears on the lower surface of the secondaries, a somewhat lighter area. The fringes are the same as in *gilberti*. The color of the spots is somewhat darker than in *gilberti*. *A. gilberti* has chromosome count of 21, while all other Texas species have count of 22. Genitalic and cremaster differences can be noted on plate 3.

The food plant is the same as *gilberti*. The type locality is also the same as *gilberti*. The larvae are bright blue and feed on the leaves as well as into the caudex of the *lecheguilla* plant, 20 mm. Their tunnels vary from 72-83 mm in length and the trap doors are located fairly near the base of the leaf and always on the upper side.

The distribution of *mariae* can be noted by the distribution map, which shows that it extends over most of western Texas, up to the Carlsbad National Park area, eastward to 2 miles east of McCamey, and well down into the Big Bend National Park area. In the area 8 miles west of Dryden it occurs along with *gilberti*, while just a little way westward from there at Sanderson only *mariae* occurs. At Boquillas Canyon and ten miles westward only *gilberti* occurs, while at the Headquarters of the Big Bend National Park and southeast towards the Boquillas Canyon area for two miles only *mariae* occurs. At Dryden *A. estelleae* occurs along with *gilberti* and *mariae*. At Langtry *gilberti* is common and only rarely will a specimen of *mariae* be found, with no specimens of *estelleae* so far having been collected 11-12 miles south of Juno *gilberti*, *rindgei* and *estelleae* occur together, as do they at the location 28 miles north of Del Rio. In the Del Rio area the dominant species is *estelleae*, with *rindgei* being next and *gilberti* rare. At the site 14 miles north of Bracketville *gilberti* is dominant and no specimens of *estelleae* were

collected prior to 1961, even though that area was heavily collected for three years before that year. Each year since 1961 *estelleae* has been getting more common there and now is as dominant as in some of the other locations where it had been collected before. *A. rindgei* is the least common species in the Bracketville area.

The photographs used in this article were made by Don B. Stallings.

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DISTRIBUTION OF PLEBEIUS SAEPIOLUS, LYCAENA MARIPOSA, AND HESPERIA COMMA ON VANCOUVER ISLAND

by RICHARD GUPPY

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My "Distribution of Butterflies on Vancouver Island," appeared in 1956 in "The Lepidopterist's News" (Vol. 10: 169). The purpose of the present paper is to record some additional information concerning three of the species which were given special mention in the above article.

Concerning *Plebeius saepiolus insulanus* Blackmore, I wrote, "The V. I. population, so far as is known, is confined to Mt. Malahat". This information I received in conversation with Mr. Llewellyn-Jones, though