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A New Species of *Agathymus* from Texas (Lepidoptera, Rhopalocera, Megathymidae)

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On August 8, 1960, I found a species of *Agave* belonging to the *parryi* complex in the Diablo Mountains 4 to 5 miles west of Victoria Canyon in western Texas. An examination of the *Agave* readily indicated the presence of a species of *Agathymus*. After carefully working the area for several hours, I collected 23 larvae from medium-sized plants. About one-half of the larvae had recently constructed trap doors over their tunnels in the leaves, and the rest made doors between August 10 and 12. The habitat was at an elevation of 5800 feet. The soil was very rocky, and various soil samples had a pH of 7.5. The general area resembled the type locality of *Agathymus judithae* (Stallings and Turner) in the Hueco Mountains, although there were many more scrub cedars and not nearly so many *Agave lechuguilla* plants as are found in the Hueco Mountains.

Of the 23 larvae, 18 pupated, from which 16 adults emerged that September. This species is an undescribed member of the *neumoegeni* (Edwards) complex.

***Agathymus diabloensis*, new species**

Figures 1-6

MALE (UPPER SIDE): Primaries black, base of wing bright orange, extending outward along inner margin of wing to a point just to edge

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of inner side of discal spot in interspace 1; cell spot fused into orange of costal area, running from cell spot to base of wing along costal area; discal band composed of three spots, one in interspace 2, wider than either of others, being 4.6 mm. wide, one in interspace 1, more or less square and 3.1 mm. wide, one in interspace 3, 3 mm. wide, tapering to a point towards cell spot but not fusing with it; two extradiscal spots fusing into somewhat broader subapical spots, just barely touching discal spot in interspace 3; all spots of same bright orange coloration as basal area. Fringes alternately black and sordid white.

Secondaries black, heavily overscaled with bright orange from base to discal band; discal band composed of six fused spots, varying in width from 1 mm. near apical angle to 3.4 mm. near anal angle, being of same bright orange coloration as overscaling near base of wing. Fringes alternating black and light orange.

MALE (UNDER SIDE): Primaries brownish black, apical angle overscaled with light gray scales; discal band same as above, except somewhat lighter in coloration; top extradiscal spot appearing as a white dot and lower one as a tiny orange-yellow triangle; three subapical spots white and somewhat smaller than above; light orange overscaling from lower inner side of discal spot in interspace 1 to base of wings.

Secondaries with ground color gray, rather evenly overscaled with light gray scales; two sordid white spots below costal margin and discal band reappearing only as indistinct gray area; a brownish area running along anal angle from edge of last discal spot to near base of wing.

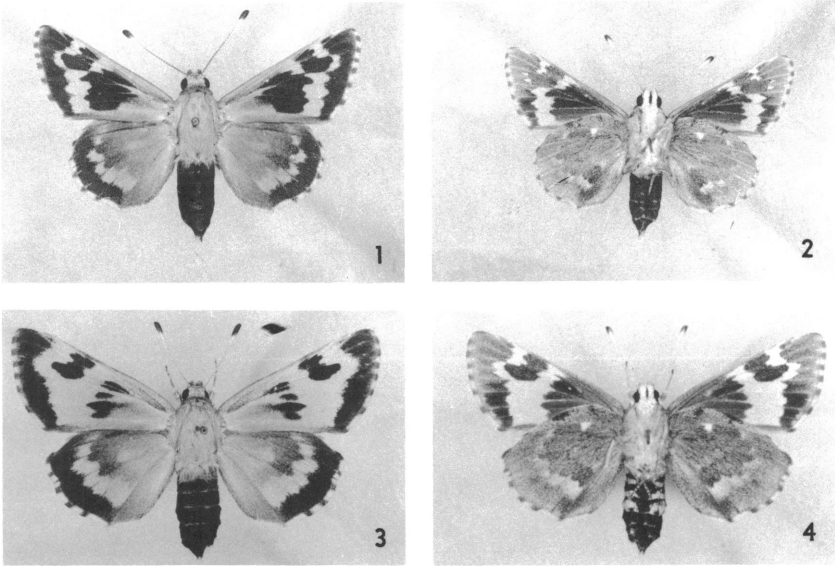
Thorax above grayish near head, becoming bright orange posteriorly, beneath light gray. Abdomen above bright orange, fusing into gray on sides, and beneath medium gray. Palpi sordid white. Legs gray. Antennae white above, ringed with minute black lines, white extending one-third of way onto club, remaining portion black.

Expanse, allotype male, 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 , 17.5 mm.; costa to anal angle, 15 mm.; total expanse, 53 mm. (average of the paratypes, 53 mm.).

FEMALE (UPPER SIDE): Primaries grayish black, basal half, costal area, and beneath cell orange; cell spot fusing into orange of costa; discal spot in interspace 3 and orange beneath cell leaving black streak in cell area, and another black area appearing between cell spot and subapical spots; discal band composed of three fused spots, one, in interspace 1, 6 mm. wide and pointed in middle towards base of wings, one, in interspace 2, 9 mm. wide and tapering towards one in interspace above, one, in interspace 3, 10 mm. wide and tapering into bottom of cell spot; extra-

discal and subapical spots all fused together and of same general coloration as discal spots and basal half of wing; outer surface of discal spots and extradiscal spots forming a more or less straight line, being only slightly wider at spot where extradiscal spots fused into discal row of spots. Fringes alternately black and light orange.

Secondaries grayish black, heavily overscaled with orange scales near base, becoming lighter near discal band of spots; discal band composed of six fused spots which evenly curved with marginal area of wing, upper-

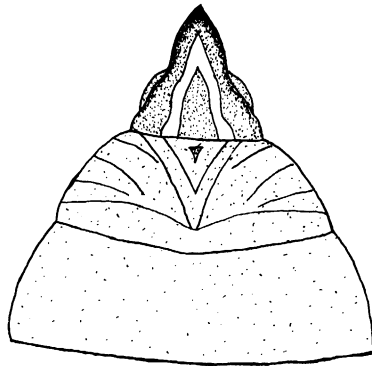
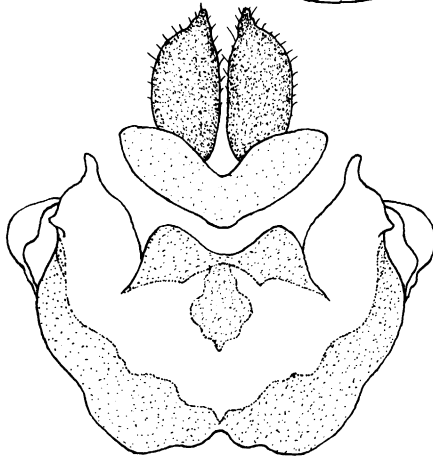
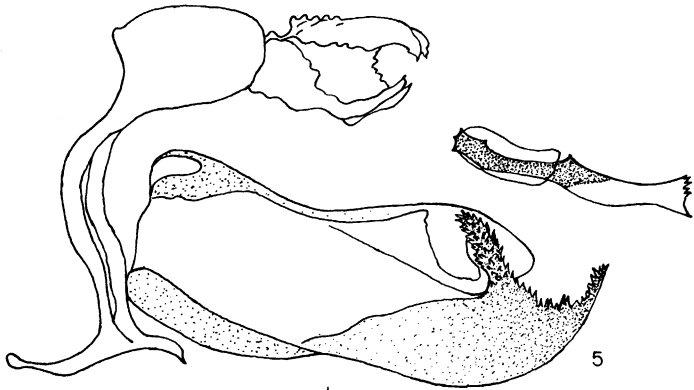


FIGS. 1-4. *Agathymus diabloensis*, new species, upper and under surfaces, respectively. 1, 2. Allotype, male. 3, 4. Holotype, female.

most spot 3 mm. wide and one near anal angle 5.5 mm. wide; all spots of same orange color as base of wings. Fringes alternately black and light orange.

FEMALE (UNDER SIDE): Primaries dark brown, apical area overscaled with light gray scales; discal band more even on both sides and somewhat lighter in coloration; top extradiscal spot lighter than lower one; subapical spots smaller than above and white in coloration; cell spot of same coloration as discal spots at bottom, becoming lighter at top; base of wings with no orange overscaling.

Secondaries very similar to those of males except only one white spot beneath costal area.



FIGS. 5-7. *Agathymus diabloensis*, new species. 5. Male genitalia. 6. Female vaginal plate. 7. Pupal cremaster.

Thorax above grayish near head, becoming orange over all remainder, beneath light gray. Abdomen above orange, becoming grayish on lower sides and light gray beneath. Palpi white. Legs gray. Antennae as in males.

Expanse, holotype, female, primaries: base to apex, 29 mm.; apex to outer angle, 16 mm.; outer angle to base, 22.5 mm.; secondaries: base to end of Cu_1 , 22 mm.; costa to anal angle, 17 mm.; total expanse, 60 mm. (average of the paratypes, 58 mm.).

TYPE MATERIAL: Holotype, female, 5 miles west of Victoria Canyon, Diablo Mountains, Hudspeth County, Texas, September 13, 1960 (H. A. Freeman); allotype male, September 12, 1960, same location and collector; five male and eight female paratypes from the same location and by the same collector, which emerged in Garland, Texas, from September 6 to 18, 1960. The holotype and a male paratype are in the American Museum of Natural History. A pair of paratypes are in the Stallings and Turner collection. The allotype and remaining paratypes are in the author's collection.

This species is named for the mountain range where it apparently is endemic.

This is another member of the *neumoegeni* complex, and it seems to have some of the characteristics of *Agathymus judithae* and *A. carlsbadensis* (Stallings and Turner). However, sufficient superficial and genitalic differences separate all three species. The males of *diabloensis* differ from those of *judithae* in the following superficial ways: the coloration of the maculation is bright orange, almost reddish, in *diabloensis*, while in *judithae* it is yellowish orange; the discal spot in interspace 3 is of the same width as the one in interspace 1 and not closely approaching the cell spot in *diabloensis*, whereas in *judithae* the spot in interspace 3 is nearly twice as wide as the one in interspace 1 and either touches the cell spot or terminates just beneath it; on the under side of the secondaries of *judithae* the discal band is well defined, while in *diabloensis* it is not much lighter than the surrounding gray overscaling. The females differ in the following ways: the maculation coloration is brighter orange in *diabloensis* than it is in *judithae*; the cell spot in *judithae* forms a sharp protrusion apically into the black area between it and the extradiscal and subapical spots, while in *diabloensis* this does not occur or is only poorly defined; on the under side of the secondaries the discal band is white in *judithae*, while in *diabloensis* it is only slightly lighter than the background. The differences between the males of *diabloensis* and those of *carlsbadensis* are as follows: the discal spots on the upper side of the primaries are similar in size and shape, but the orange overscaling is more restricted to the basal area in

carlsbadensis than it is in *diabloensis* and not so bright in color; there is less overscaling on the upper side of the secondaries of *carlsbadensis* than in *diabloensis*; on the under side of the secondaries the ground color and overscaling are much darker in *carlsbadensis* than in *diabloensis*. The females differ in about the same ways, except in *carlsbadensis* the discal band of spots on the primaries is narrower, thus showing more ground color than in *diabloensis*, and the basal overscaling is more extensive in *diabloensis*.

The male genitalia somewhat resemble those of *judithae* in shape, but there are basic differences in both the uncus and valvae, as can be noted in figure 5. The genital plate of the female is not like that in either *carlsbadensis* or *judithae*, especially in the general shape, as can be noted in figure 6.

Because the cremaster of the pupa is now used in various determinations, a sketch of it appears in figure 7. This structure shows specific differences in shape as well as suture markings in the last abdominal segment. These suture markings are very faint in *judithae*, but much more prominent in *diabloensis*.

DESCRIPTION OF MATURE LARVAE: Average length, 38 mm.; transverse diameter, 10 mm. at the sixth segment.

Body rather stout, with an abrupt cephalic tapering, beginning at the fifth segment. Color greenish blue. Caudal segment dark brown. Dark black scutellum on first segment. Legs same color as the body. Prolegs same color as legs. Clasper brownish. Spiracles oval, conspicuous, dark brown.

Head light brown, with a few concolorous hairs present. Surface very finely granular. Segmental lines separating lobes and clypeus somewhat darker in color than contiguous parts. Ocelli minute, light tan. Mouth parts brown, with mandibles nearly black. Head small (3.1 by 2.4 mm.) as compared with rest of body.

MALE PUPAE: Length, 27–31 mm.; width, 7.1–7.8 mm.

FEMALE PUPAE: Length, 33–36 mm.; width, 8.0–8.6 mm.

PUPATION PERIOD: August 15–22, 1960.

In general appearance the pupae of this species resemble those of *A. mcalpinei* (Freeman).

TUNNEL AND EXCAVATION: The trap doors were constructed between August 6 and August 14 and were light brown in color, being lighter than those of either *judithae* or *carlsbadensis*. The tunnel burrowed by the larvae as it fed was longer than that of any of the other related species, being 88.6 mm. in average length, as compared with that of *carlsbadensis*, 76.4 mm.; *judithae*, 75.8 mm.; *mcalpinei*, 74.7 mm.; and *florenceae* (Stallings and Turner), 67.9 mm.

HOST PLANT: A member of *Agave* in the *parryi* complex.

HABITAT: Approximately 5 miles west of Victoria Canyon, Diablo Mountains, Hudspeth County, Texas. The elevation was 5800 feet. Soil was rocky, limestone shale. The pH was 7.5, which is fairly typical of the area. Growing in the same area were such plants as *Agave chisosensis*, *Agave lechuguilla*, *Yucca elata*, *Yucca torreyi*, *Yucca faxoniana*, mesquite, sotol, ocotillo, and many cacti. Most larvae were found on the sides and top of low, rocky ranges, especially on the eastern slopes.

Among the specimens that emerged from this area was one female hybrid of a cross between an early-emerging male *Agathymus mariae* and a late-emerging female *diabloensis*. These data are based on the fact that the females of *mariae* never select any other species of *Agave* than *lechuguilla* in which to place her eggs, and this larva of the hybrid was found in a *parryi* plant. This female hybrid differed considerably from the five hybrids that I had previously reared from the Hueco Mountains, Texas, of a cross between male *mariae* and female *judithae* specimens. These five specimens are two males and three females. The three females were very similar and at first were thought to represent an undescribed species. However, after careful morphological studies they were found to have characteristics of both *mariae* and *judithae*, with the *judithae* genes being dominant. In the present hybrid it seems as if the *mariae* genes overshadow the *diabloensis* genes. The hybrids appear every other year in the Hueco Mountains and not each year, which, with the fact that the strain of *judithae* is apparently pure, indicates that the hybrids are completely sterile. Whether this condition occurs in the Diablo Mountains is uncertain, as this habitat was studied for the first time in 1960.

The photographs were made by Mr. Robert Spafford, a student in Hillcrest High School, Dallas, Texas.

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