

NOTES ON THE DISTRIBUTION OF OREGON
SHIELD-BACKED KATYDIDS WITH THE
DESCRIPTION OF A NEW SPECIES OF
IDIOSTATUS (ORTHOPTERA:
TETTIGONIIDAE: DECTICINAE)¹

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ABSTRACT: A new species of *Idiostatus* in the Hermani Group is described from the Greasewood-saltbush plant association of southeastern Oregon in the Abert Lake vicinity. New records of *Idiostatus inermoides* Rentz extend the range of that species north into southern Oregon. *Capnobotes occidentalis* is recorded from Oregon for the first time and a population of *Apote notabilis* is listed as the southern distributional record of the species.

DESCRIPTORS: *Idiostatus*: new species; bionomics; distribution. New records: *Capnobotes occidentalis*; *Apote novabilis*.

Recent field collections in southeast Oregon by the second author have yielded a number of range extensions and a new species of *Idiostatus*. New range extensions include *Capnobotes occidentalis* Thomas, Great Basin species recorded from Oregon for the first time and *Apote notabilis* Scudder for which the included record is the southernmost known distribution of the species. The known geographic range of *Idiostatus inermoides* Rentz is extended from northwestern Nevada into southeastern Oregon. The new species of *Idiostatus* is closely related to *I. inermoides* and may actually come into contact with that species as represented by the population's Alvord Desert-Juniper Lake area.

Idiostatus chewaucan Rentz and Lightfoot, new species

(Figures 1 – 6)

Diagnosis. – Readily recognized as a member of the Hermani Group (see

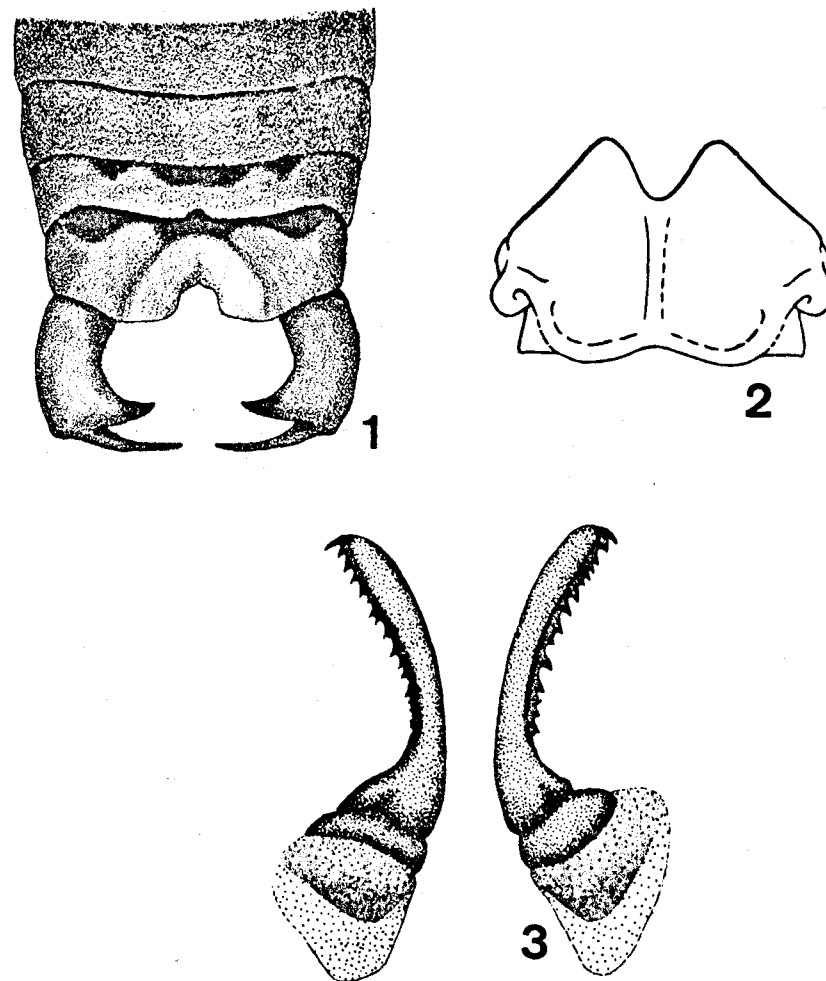
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Rentz, 1972; 62) by its distinctive coloration which is basically green with the central portion of the abdominal tergites and pronotum contrastingly colored forming a broad longitudinal stripe. Males have the lower tooth of the cercus less elongate (fig. 1) than in *I. hermani* and the titillators have fewer teeth (fig. 3) and are flanged basally. The tenth tergite is unspecialized and marked with black as is typical of the species group. Females have a short ovipositor and subgenital plate with a well defined notch (fig. 2). As with most of the other members of the Hermani Group, *I. chewaucan* is an occupant of the Greasewood-saltbush plant community.

Description. — HOLOTYPE MALE. Oregon, Lake County, Abert Lake, 12 July 1974. David C. Lightfoot collector. The holotype and allotype are deposited in the California Academy of Sciences, Number 12519. Size medium for genus, form robust. HEAD with fastigium of vertex well produced, broad, 1 1/2 times as broad as interocular distance. Eyes prominent, bulging, distinctly longer dorso-ventrally, 2 1/2 times as broad as first antennal segment. PRONOTUM smooth dorsally, not polished, transverse sulcus present in anterior portion extending for short distance onto lateral lobes; median portion of disk with a pair of minute indentations, median carina indicated only by color; posterior portion of lateral lobe declivent, posterior margin of disk concave, raised. TEGMINA protruding for a distance equal to slightly less than half the length of pronotum. APPENDAGES. Fore femur bearing 1 and 3 teeth on anterior margin of ventral surface, genicular lobe of same bearing a pair of minute teeth; fore tibia armed dorsally with 3 evenly spaced spines on posterior margin, anterior margin unarmed; ventral surface bearing 6 teeth on both margins. Middle femur armed on anterior margin of ventral surface only, with 2 and 3 minute teeth; anterior genicular lobe with 2 minute teeth, posterior genicular lobe with a single tooth; middle tibia armed dorsally with 2 spines, placed medially on anterior margin and 4 spines on posterior margin; ventral surface bearing 6 spines on both margins. Hind femur armed ventrally with 3 and 5 teeth on outer margin, inner margin with 4 and 5 teeth; genicular lobe armed only internally. Hind tibia armed dorsally with 21 spines on internal margin, 24 on outer margin, dorsal surface bearing a pair of apical spurs, the internal of which is slightly longer; ventral surface bearing 6 and 7 spines on internal margin, external margin with 7 and 12 spines; apex with 4 very elongate spurs, internal pair less than half the length of outer spur. Plantula of hind tarsus short, quadrate, 1/3 length of metatarsus. ABDOMEN dorsally smooth, without any trace of median carina, pilosity absent except where noted below; dorsum of tenth tergite with soft median integumental area well indicated, sparsely pilose; cercus rather stout, shaft evenly cylindrical, apex divided forming 2 teeth, the ventral of which is slightly the longer, apex of dorsal tooth distinctly curved mesad and ventrad. Subgenital plate rather prominent, apex with shallow V-shaped incision; styles short 1 1/2 times longer than broad, 1/3 length of one side of incision. Titillator very similar to that of *I. inermoides* Rentz, base flat, flanged at ventro-external margin, arm elongate, flat, toothed on outer margin with 7 teeth, apical quarter of titillator concave dorsally. COLORATION basically light green. Dorsum of head, pronotum, and abdomen dark pinkish brown; abdominal tergites 5-10 marked laterally with black, 10th tergite more extensively marked. All femora unmarked with black. Teeth and spines all black-tipped, teeth of femora entirely black. Tegmina with veins straw brown, cells smoky.



Figures 1-3. Diagnostic structures in *Idiostatus chewaucan* Rentz and Lightfoot, new species. Figure 1, apex of Abomen, male paratype. Figure 2, subgenital plate, female paratype. Figure 3, titillator, male paratype.

ALLOTYPE FEMALE. Same data as holotype. Similar to male but with following exceptions: size somewhat larger, form more robust. Tegmina slightly protruding beneath pronotum, with 5 longitudinal veins extending from base to apex. Tenth tergite deeply excavate, V-shaped. Cercus stout, conical, apex blunt, faintly directed ventrad. Subgenital plate with median notch broadly U-shaped, somewhat resembling *I. hermani* Thomas. Ovipositor about equal in length to hind femur, straight, apex with many scattered minute tubercles. Color similar to male except dorsal longitudinal stripe much lighter.

Derivation of name. — This species is named after pluvial Lake Chewaucan which covered the area where the species is found. Abert Lake and Summer Lake are remnants of Lake Chewaucan.

Type Locality. — The exact type locality of *Idiostatus chewaucan* (fig. 5) is a State Highway Commission gravel stockpile area along U.S. H.W. 395, approximately 4 miles north of Lake Abert and 2 1/2 miles south of Hogback Summit, Lake County, Oregon.

Seasonal Occurrence. — *I. chewaucan* has only been collected in the middle of July at which time adults were prevalent though a few last instar nymphs were also present. In captivity, males stopped singing in September and females declined ovipositing in October. Towards the end of September, specimens became sluggish and colors began to darken and fade. In captivity, two females collected on July 17, 1975, lived until November 22 of that year. At the time of death one still contained 13 eggs, the other 6.

Distribution. — *I. chewaucan* is known only from the Chewaucan basin in south-central Oregon (fig. 6). This large "U" shaped basin contains two large saline lakes, Lake Abert and Summer Lake. The species is found in localized populations and appears to inhabit only the northern ends and central perimeter of the basin. Specimens were found at the north end of Lake Abert (type locality), the north end of Summer Lake, and in an area 6 miles northwest of Valley Falls. Searches were made along the east side of Lake Abert and the west side of Summer Lake without finding a trace of the species. The southern edge of the basin does not seem to have a favorable habitat (see habitats below). The Alkali Lake basin and the Silver Lake-Christmas Valley area north of the Chewaucan basin both offer a suitable habitat. However during the two consecutive years *I. chewaucan* was collected, these other areas were collected without a sign of any *Idiostatus* species. Warner Valley to the east also has a suitable habitat though the 2,000 foot escarpment of Abert Rim which borders the east side of the Chewaucan basin may act as a barrier to movement in that direction, since the species seems to be limited to lower elevations.

Habitats. — *I. chewaucan* seems to be very particular in habitat preference. This species occupies the greasewood-saltbush plant community, although

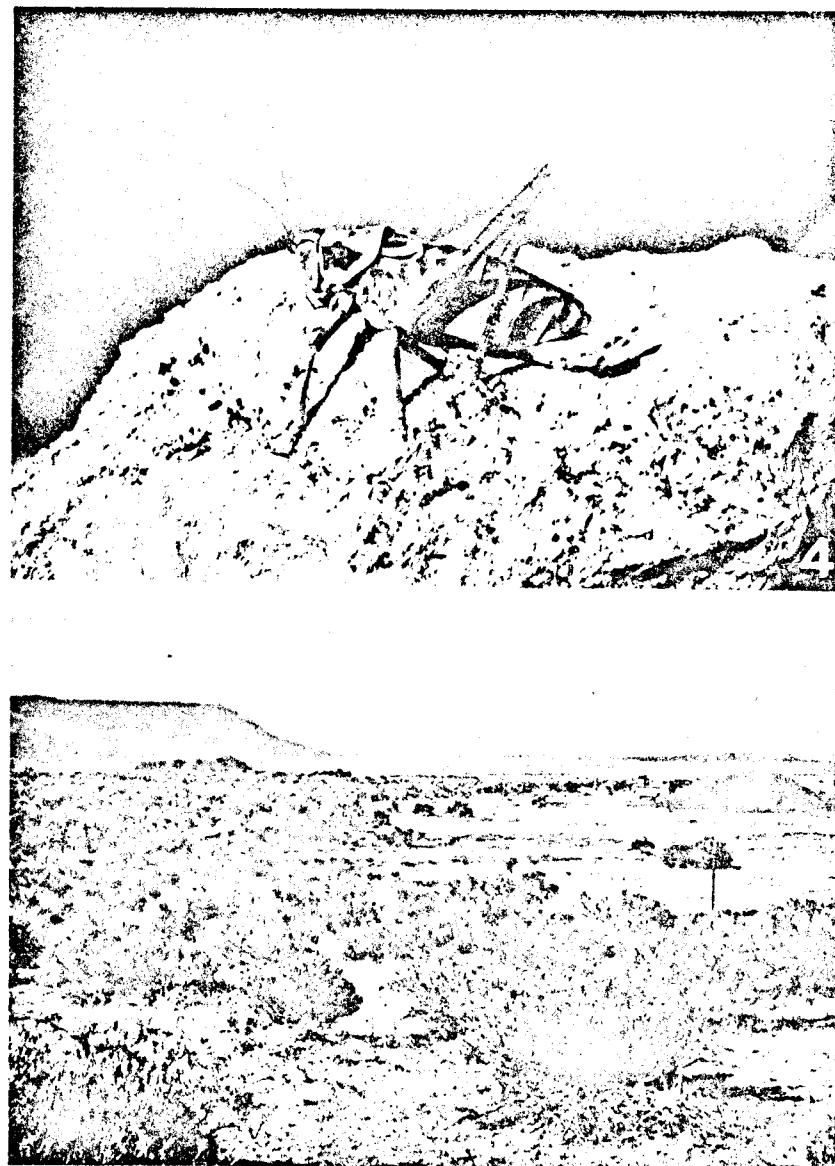


Figure 4. *Idiostatus chewaucan* Rentz and Lightfoot, new species, male paratype. Figure 5. Type locality, *Idiostatus chewaucan* looking south. Note Abert Rim and Abert Lake in distance. Plants in foreground include greasewood, saltbush, and rabbit bush.

only in areas where soil and plant conditions are suitable. It appears that *I. chewaucan* is limited to areas where the plants *Sarcobatus vermiculatus*, *Atriplex confertifolia*, and *Grayia spinosa* are found growing together on soil that is sandy or very loose. Both the vegetation and soil appear to be important factors. Many areas were searched where just one of the above elements was missing, with no sign of the species.

Of the three plants, *Sarcobatus vermiculatus*, *Atriplex confertifolia*, and *Grayia spinosa*, *I. chewaucan* seems to prefer *Atriplex confertifolia*. Although specimens were found on all three of these shrubs, they were found most often on *Atriplex*, although *Sarcobatus* was usually the most abundant. In captivity, specimens fed readily on all three plants, but no feeding was observed in the field. The only other plants *I. chewaucan* was found on were Russian thistle (*Salsola kali*), filaree (*Erodium cicutarium*), both growing on gravel surrounding the gravel piles at the type locality, and *Atriplex canescens* which was noted at some locations. In all areas *I. chewaucan* was collected, there were small amounts of rabbit brush (*Chrysothamnus nauseosus*) although no specimens were found on it. Ana Reservoir was the only location where big sagebrush (*Artemisia tridentata*) was present but no specimens were found on this plant either.

A number of areas were searched without success where the proper vegetation was present but the ground consisted of heavy alkaline or clay soils. All locations where *I. chewaucan* was collected were areas of loose, sandy soil where alkali flats met elevated land, and always at the north end of the flat. This may be attributed to the fact that in the northern Great Basin, prevailing southerly winds have deposited sand and light soils on the northern flanks of most of the smaller basins. Sandy soil may be preferred by *I. chewaucan* for oviposition or may only be significant for the proper vegetation.

Typical orthopteran associates of *I. chewaucan* include: *Aeoloplides* sp., *Trimerotropis arenacea*, *Trimerotropis bilobata*, *Trimerotropis gracilis*, and *Trimerotropis latifasciata*.

Behavior. — As with other members of the Hermani Group, *I. chewaucan* is a diurnal species. Through observations at the type locality, it was found that the species became active soon after sunrise in the morning when the temperature reached about 65°F. At this time males began to sing. Singing increased as the day got warmer. The peak period of singing was from about 10:00 A.M. to 3:00 P.M. (PDST) when the temperature ranged from 80° to 95°F. During the mid-day hours, specimens were always found on the upper parts of bushes. In the late afternoon singing diminished and ceased completely by 6:00 P.M. At 7:00 P.M. both males and females were noted

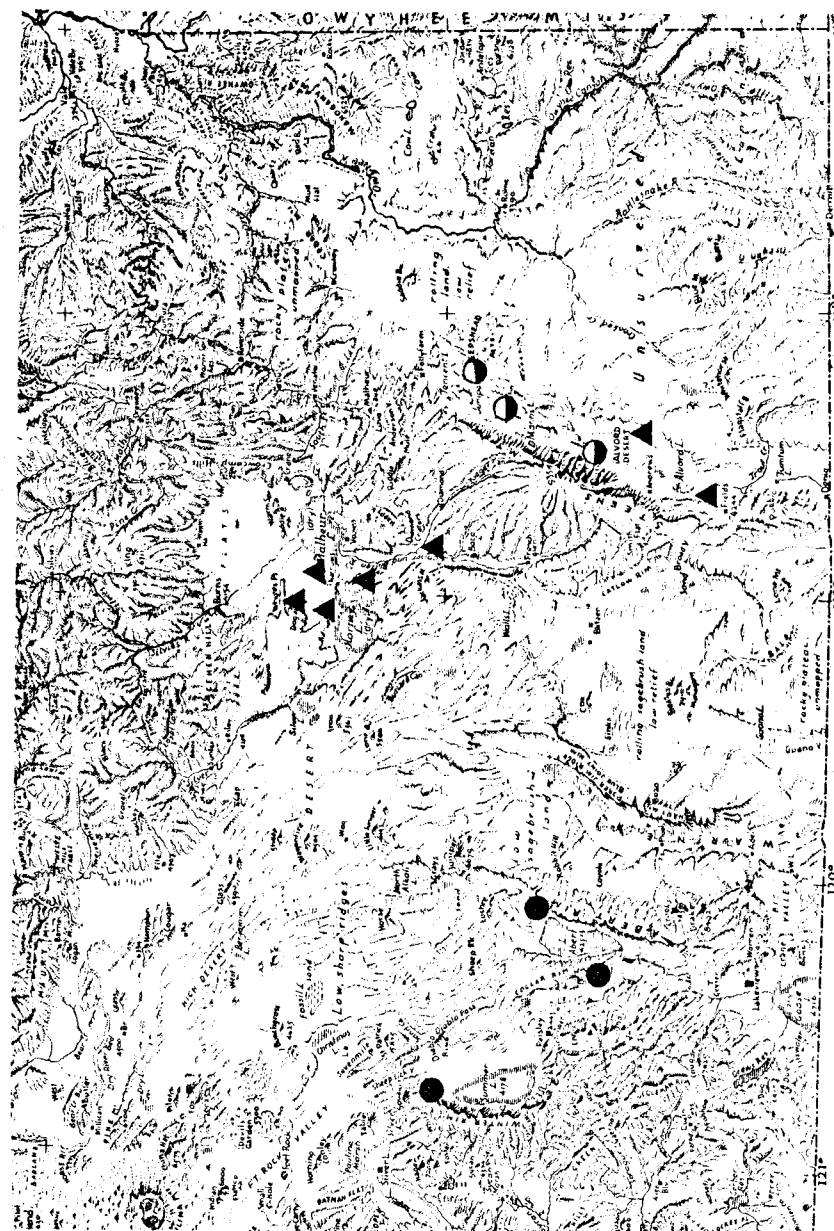


Figure 6. Known distribution of *Idiostatus* species in southern Oregon. Filled circles, *I. chewaucan*; triangles, *I. inermoides*; half-filled circles, *I.* species.

wandering about on the ground though none were heard singing. Males resumed singing shortly after sunset (8:45 P.M.). At night singing males were always found in bushes while females and other males would wander around on the ground. Driving along highway 395 near the type locality from 9:30 P.M. to 11:00 P.M. both females and males were found to be very numerous on the surface of the road and males could be heard singing from surrounding vegetation. Males continued singing until about 1:00 A.M. when the temperature dropped to 60°F.

No mating or oviposition was observed in the field though observations were made in captivity. Oviposition was observed often from mid August to the end of September, always occurring in the evening. All eggs were laid in sand. The oviposition procedure is exactly as described of *I. hermanii* (Rentz, 1973) though the number of eggs laid at a single site is not known. Mating was observed on August 25 at approximately 1:00 P.M., when the temperature was 85°. The mating procedure was similar to that illustrated of *I. hermani* (Rentz, 1972). Copulation took place on a sand surface, the female upright and the male on his back with his abdomen arched under the female. Copulation lasted 12 minutes after which the two separated and the female tried unsuccessfully to remove the spermatophore. Though no other matings were witnessed, throughout the month of August females were often seen in the afternoon with spermatophores attached. As mentioned, *I. chewaucan* is found in localized populations. These populations appear to be stationary. At all locations *I. chewaucan* was collected it was found to be quite numerous.

Song. — The song of *I. chewaucan* is very much like that of *I. inermoides* through somewhat louder. During both the daytime and night the song takes the form of a continuous buzz, broken intermittently by a few zicks. The day and night songs sound identical though the night song is at a somewhat slower pace, probably due to the cooler temperature. The song begins with a series of raspy zicks which gradually increase to a very rapid, continuous, zick-zick-zick - - -. At close range the rapid individual zicks can be made out but at a distance it sounds like a high-pitched, undulating, buzz. In the morning and early evening when singing begins the periods of buzzing are short and broken by long series of zicks. Both warning zicks and the Distress Call are used by *I. chewaucan*.

Additional Remarks. — In collecting specimens it was found that collecting on the road surface at night was by far the best method (Rentz, 1968, 1973). During the day specimens were always found in bushes where they were extremely difficult to capture. Once located in a bush the specimen usually dives into the middle to the dense, thorny plant where it is nearly impossible

Measurements (in mm) of *I. chewaucan*

	Length body	Length pronotum	Width pronotum	Length hind femur	Length ovipositor
Males:					
holotype	27.0	7.1	4.5	18.6	
paratopotype	23.0	6.3	4.5	18.0	
NE end Abert Lk	28.0	6.2	4.5	18.0	
NE end Abert Lk	30.0	6.0	4.5	18.5	
NE end Abert Lk	29.0	6.8	4.6	18.3	
NE end Abert Lk	28.0	6.0	4.0	18.5	
NE end Abert Lk	26.0	7.6	4.6	19.0	
NE end Abert Lk	26.5	6.0	4.5	19.0	
NE end Abert Lk	28.5	7.0	4.5	18.5	
Females:					
allotype	30.0	6.6	4.1	19.6	19.2
paratopotype	28.0	6.7	4.0	20.0	21.4
NE end Abert Lk	26.0	6.9	4.2	20.0	21.3
NE end Abert Lk	26.0	6.8	4.3	20.0	19.0
NE end Abert Lk	27.0	6.5	4.1	20.2	18.0
NE end Abert Lk	27.0	6.8	4.0	19.8	20.0
NE end Abert Lk	25.0	6.2	4.0	18.5	20.4
NE end Abert Lk	26.0	6.2	4.1	20.0	21.2
NE end Abert Lk	25.0	6.1	4.0	20.0	20.5
NE end Abert Lk	24.0	6.0	4.3	18.0	20.0

to see. Road collecting was also useful in determining the extent of populations as described by Rentz (1973).

I. chewaucan is most closely related to *I. inermoides* and the two could possibly come into contact at the southeastern limit of the range of *I. chewaucan* or the western limit of *I. inermoides*. Warner Valley would be one of the most likely areas where the two might come into contact. This area has not been collected for either species and future collecting here would be most desirable.

Males of *I. chewaucan* key to *I. inermoides* Rentz (Rentz: 1973:35). Females key to *I. hermani* Thomas. Both sexes can be readily separated at those points by inserting, at couplet 13 that males of *I. chewaucan* have the lower tooth of the cercus less elongate and more stout and the titillators have fewer teeth and are flanged basally. Females may be separated at couplet 8 (Rentz: 1973:39) by noting the difference in distribution between *I. hermanii* and *I. chewaucan*.

Records. — OREGON: LAKE COUNTY: Lake Abert, 4 mi. N.E., 15 July 1974 (D.C. Lightfoot & W.N. Mathis, 3♂♂, 2♀♀, holotype, allotype, paratypes); Lake Abert, 1-6 mi. NE., 17, 18 July 1975 (D.C. Lightfoot, 24♂♂, 27♀♀, 1 last instar ♂, 1 last instar ♀, paratypes); Lake Abert, X-L Ranch, 1 mi. E., 18 July 1975 (D.C. Lightfoot, 2♂♂, 1♀); Valley Falls, 6-7 mi. NW., 19 July 1975 (D.C. Lightfoot, 2♂♂, 1♀, 1 last instar ♂); Summer Lake, Ana Res., 1/2 mi. NE., 19 July 1975 (D.C. Lightfoot, 3♂♂).

The topotypic series was collected at mid-day around noon when singing males revealed their presence. Most of the specimens were collected on Russian thistle (*Salsola kali*) which was growing on the gravelly area adjacent to the gravel piles. Individuals also were heard and seen on the surrounding greasewood and saltbushes but were very difficult to capture. Both males and females were taken from vegetation. The species was fairly common at the type locality but seen nowhere else. On this same day, stops were made all along the east side of Lake Abert and at Alkali Lake, but *I. chewaucan* was not heard or seen at any of these locations. All specimens of the type series were green except one male which was gray-brown in color.

As with other members of the Hermani Group, the coloration of *I. chewaucan* is highly variable. The general color patterns are very similar to *I. inermoides* though usually there is not as much color variation per individual. The two basic color forms, green and gray-brown, were at about an equal proportion in all specimens seen. In green specimens, all retained two parallel pink-red stripes running the length of the body on the dorsum. Green specimens varied from having black markings only on the last two abdominal tergites to those with black markings on each tergite. In specimens lacking the black marks, the pink-red coloration was usually much more reddish than

those with the black markings which retained a more pinkish color in the two parallel stripes. In the gray-brown specimens, there are two general color patterns. In one the entire body is basically a mixture of gray and brown with the black variegated pattern on the dorsum of the abdomen. The other has a generally gray body except for a broad yellow stripe which runs dorsally the entire length of the body from the fastigium to the last abdominal tergite. The pattern of black markings on the dorsum of the abdomen is usually much less pronounced in specimens with the yellow band. There are color variations within the green color form and the gray-brown color form, but unlike *I. inermoides*, there was found to be no mixture of green and brown in any one specimen, with the rare exception of a slight greenish tinge in the legs of some gray-brown individuals.

Idiostatus inermoides Rentz.

Idiostatus inermoides was found to be fairly common throughout the southern end of the Sunset Valley between Harney and Malheur lakes. This is an area of extensive alkali flatland, vegetated mostly by greasewood with some sagebrush and *Atriplex* spp. *I. inermoides* was found only on the flats and unlike *I. chewaucan*, on heavy alkaline soils, where it showed a preference for *Sarcobatus vermiculatus*. Specimens were rarely taken on saltbushes (*Atriplex* spp.) and occasionally on Russian thistle (*Salsola kali*) growing along the road sides. *I. inermoides* was also collected in the Alvord basin, just north of the type locality (near Denio, Nevada; Rentz 1973). Here too, specimens were found only on alkaline flatland and showed a preference for *Sarcobatus vermiculatus*. In both the Sunset Valley and Alvord basin, the species was found over a wide area but in scattered, localized populations.

In most respects, *I. inermoides* was very similar to *I. chewaucan*. The species appeared to be most active during the early afternoon and late evening. The song of *I. inermoides* sounded very much like *I. chewaucan* though not quite as loud. At night *I. inermoides* did not sing to the degree of *I. chewaucan*, though the song did take the form of a buzz.

One interesting observation was that specimens were not found on the road surface at night. On five or six occasions, the second author drove for some time in the evenings on smooth, paved, roads but was able to find only one specimen (♀), crushed on the road surface, even though numerous males could be heard singing from roadside vegetation. In the Alvord basin, road collecting was impractical because the only road through the area had a very rough, gravel surface.

Records. — OREGON: HARNEY COUNTY: Narrows, 5 mi. N., 17 August 1974 (D.C. Lightfoot, 1♂); Malheur Environmental Field Station, 7-15 August 1975 (D.C.

Lightfoot, 13♂♂; Narrows, 5 mi. N., crushed on surface H.W. 205, 12 August 1975 (D.C. Lightfoot, 1♀); Narrows 20 mi. S., 13 August 1975 (D.C. Lightfoot, 2♂♂); Harney Lake, N.E. end, sand-dunes, 13 August 1975 (D.C. Lightfoot, 1♂); Alvord Desert, Borax Lake, 10 August 1975 (D.C. Lightfoot, 1♂); Fields, 1 mi. N., 10 August 1975 (D.C. Lightfoot, 1♂).

Idiostatus sp. ?

Traveling to the Alvord Desert a stop was made just north of Juniper Lake to collect Orthoptera and a species of *Idiostatus* was discovered that looked identical to *I. chewaucan*. The habitat at this location was very different from that typical of *I. chewaucan* or *I. inermoides*, being a sagebrush plant community rather than a greasewood-saltbush plant community. Specimens were collected on sagebrush and rabbit brush where males were found singing. Continuing south along the gravel road, a number of stops were made and the species was encountered each time. After many observations, it became apparent that the species had no host preference. Specimens were found on all plants from sagebrush to giant wild rye grass (*Elymus glauca*). Specimens were especially numerous in a dense growth of Russian thistle which bordered the road much of the way. The species was noted as far south as Mann Lake with the exception of one female that came to a black-light at Pike Creek, three miles south of Alvord Ranch. This location was also in the sagebrush plant community, well above the alkali flat below. No males were heard singing during the day at Pike Creek nor were any other *Idiostatus* seen. At both Mann Lake and Juniper Lake, specimens of *I. inermoides* were seen on greasewood which was found growing only near the lakes. Though attempts were made, unfortunately none of these specimens could be caught.

This species is very closely related to *I. chewaucan* and *I. inermoides* if not one of the two. It has characteristics similar to both species yet cannot be placed with either one. The size is nearly the same as *I. chewaucan* thus larger than *I. inermoides*. The cerci are very similar to both species though the internal tooth seems to be stouter than either *I. chewaucan* or *I. inermoides*. The subgenital plate of the female does not compare with *I. chewaucan*, though is similar to *I. inermoides*. The coloration is highly variable as in both species, but tends to follow the pattern of *I. chewaucan*. To the unaided ear the song could be taken for either species. The main reason we believe this species to be something other than *I. chewaucan* or *I. inermoides* is the very different habitat in which it was found. In collecting *I. chewaucan* and *I. inermoides* we have always found them to be quite particular as to the plant life they are associated with, which is not characteristic of this species. A strong possibility is that this population is just a variation of *I. inermoides*.

Typical orthopteran associates of *Idiostatus* sp: *Aulocara elliotti*, *Oedale-*

onotus enigma, *Melanoplus* spp., *Conozoa wallula*, *Trimerotropis pallidipennis*, *Cratypedes neglectus*, and *Steiroxys* sp.

Records. — OREGON: HARNEY COUNTY: Juniper Lake to Mann Lake, 9, 11 August 1975 (D.C. Lightfoot, 7♂♂, 2♀♀); Alvord Desert, Pike Creek, 9 August 1975 (D.C. Lightfoot, 1♀).

Capnobotes occidentalis (Thomas)

During the second author's stay at the Alvord Desert he camped at Pike Creek, a small stream which runs down the east face of Steens Mountain and discharges into the great playa of the Alvord Desert.

C. occidentalis was found to be quite common at this location. The two nights spent there were warm and still and males were very common at night singing from surrounding vegetation. The species was especially abundant in the vicinity of a cluster of cottonwood and willow trees growing along the portion of the creek where he camped. The surrounding vegetation consisted mostly of sagebrush and rabbit brush with many open areas of short grass. Most of the specimens were found on sagebrush growing near the creek though a few were on the cottonwood and willow trees. The species became very scarce and was seldom encountered away from this small grove of trees. All specimens seen on sagebrush were gray in color. Only two green individuals were found, one on willow and the other on cottonwood. Males situated themselves near the tops of sagebrush plants to sing. Those in the trees were usually on the lower branches. Singing began only after dark, about 9:00 P.M., and continued through the entire night. The temperature both nights ranged from 85°F at sunset to a low of 72°–74°F shortly after midnight. The song consisted of a continuous series of loud, rapid, tsh-ts-ts-ts-ts-ts-ts--tsh-ts-ts-ts-ts-ts-ts--tsh-ts-ts-ts-ts-ts-ts- - - -, each set lasting about 3 seconds at 1 second intervals. The species was also collected about 8 miles south of Pike Creek near Andrews in the early summer of 1972, when a male was swept from sagebrush and rabbit brush.

Records. — OREGON: HARNEY COUNTY: Andrews, 3 mi. N.E., 15 June 1972 (D.C. Lightfoot, 1♂); Alvord Desert, Pike Creek, 9-10 August 1975 (D.C. Lightfoot, 7♂).

Apote notabilis Scudder

While at Pike Creek, the second author collected a male of *Apote notabilis*,

which appears to be the southermost record for the species.

While collecting in the evening, a call similar to *Capnobotes* was heard. Though much time was spent trying to locate the source, the attempt was unsuccessful. The following afternoon the song was heard again and after stalking it for nearly a half hour, a large, gray, dectacid was spotted near the top of a five foot sagebrush plant. Attempts to catch it were unsuccessful as it dove for the center of the bush. Much of that evening and night was spent trying to locate the extremely wary insect as it sang. The next morning the song was again heard and after a great deal of time, finally the katydid was captured which to my surprise was an adult male *Apote notabilis*. This specimen sang at any and all times of the day and night, the form of the song never changing. The song itself consisted of a short series of very loud, rapid, tsit-tsit=tsit-tsit-tsit-tsit- - - , lasting for about 4 seconds. Only one series was elicited at a time and usually 2 to 3 minutes apart. This long pause in the song made locating the specimen a very difficult and time consuming task, especially since it would usually stop singing when approached within 75 feet. No other specimens of this species were heard or seen on the trip.

Records. -- OREGON: HARNEY COUNTY: Alvord Desert, Pike Creek, 11 August 1975 (D.C. Lightfoot 1♂).

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