

ON A COLLECTION OF ORTHOPTERA FROM SOUTHERN ARIZONA, WITH DESCRIPTIONS OF NEW SPECIES.

By ANDREW NELSON CAUDELL,
Of the Department of Agriculture.

The majority of the Orthoptera here noted were taken by E. J. Oslar, mostly in the Huachuca Mountains, during the summer of 1903. A few other species have been added, but where not otherwise mentioned the specimens were collected by Oslar. All the specimens are now deposited in the United States National Museum.

SPONGOPHORA APICIDENTATA, new species.

One male, one female, Tucson, Arizona, January 14, on giant cactus, by H. G. Hubbard.

Description.—In size and general appearance very like *S. brunnei-pennis*, the female being practically indistinguishable from that species. The males, however, differ quite decidedly from *brunnei-pennis* in the form of the forceps, which are shorter, more incurved, and armed with a single tooth, near the apex, and by having the pygidium wider and more broadly concave apically. Lateral folds of the abdomen, as in *brunnei-pennis*. The antennae seem to consist of but fourteen segments, but some of them may be missing.

Length, male, 9 mm.; female, 8 mm.; forceps, male, 3 mm.; female, 3 mm.

Type.—Cat. No. 8257, U.S.N.M.

Besides the types, I have seen six males and one female from the same place, taken under the same circumstances, one male and two females from Los Angeles and San Diego counties, California, as well as several females, probably belonging here, from Catalina Springs and Fort Yuma, in Arizona, and a few taken under old leaves near Columbia, Texas.

The apparently fourteen segmented antennae would serve to locate

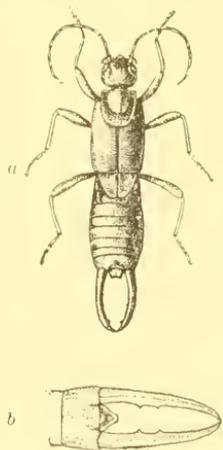


FIG. 1.—a, SPONGOPHORA APICIDENTATA. b, TERMINAL SEGMENT OF ABDOMEN OF *S. BRUNNEI-PENNIS*.

this species in the genus *Labis*, but its close relationship to *Spongophora brunneipennis* seems to justify its being placed as congeneric with that species. While normally with fifteen segments in the antennæ, many specimens of *S. brunneipennis*, even with antennæ seemingly perfect, have but fourteen. But in most forficulids the structure of the antennæ is such as to make it very difficult to tell if all the segments are present or not. The number of antennal segments in our species of *Spongophora*, and probably of some other genera, may be found to vary somewhat.

Apicidenata, as a whole, differs from its ally in being a little smaller, the female seemingly less elongate as a rule, and generally with the wings more unicolorous. A figure of the apex of the abdomen of a male *brunneipennis*, showing the pygidium and foreeeps, is given for comparison.

ISCHNOPTERA UHLERIANA Saussure.

One male, Patagonia Mountains, May 15; one male, Huachuca Mountains, August 22.

BLATTA ORIENTALIS Linnæus.

One male, Nogales, June 20.

The males of this species exhibit considerable variation in the length of the elytra, some having them but twice as long as the pronotum while in others they are two and one-half times as long.

PERIPLANETA AMERICANA Linnæus.

One immature female, Nogales, June 14. Also an adult male from Florence, Arizona, collected by Beiderman, and an adult female from Yuma, Arizona, taken by H. Brown.

This nymph from Nogales is colored more like *P. australis*, and would have been considered as that species but for the lack of records of this species from Arizona.

HOMŒOGAMIA APACHA Saussure.

Five males, Nogales, June 17, July 25; three males, Huachuca Mountains, August 20 to 28.

The U. S. National Museum contains specimens of *apacha* from California and Arizona, and of *H. erraticus* from Arizona, Texas, Colorado and New Mexico. Color and interocular space are not always correlated in these two species. Thus their distinctness is not so striking as was once thought.

A male taken at Phoenix, Arizona, on June 9, 1904, by R. E. Kunzé is wholly infuscated, except for a pale emargination of the front and sides of the pronotum and the anterior third of the costal

margin of the elytra. It corresponds with the variety *nigricans* of *H. bolliana*, and may be called *H. apacha* var. *infusata*.

A typical male *apacha*, also taken by Kunzé at Phoenix, on May 13, is below the record in size, measuring as follows: Length of elytra, 12 mm.; pronotum, 3.5 mm.; width of pronotum, 4.5 mm.

YERSINIA SOLITARIA Scudder.

One specimen, apparently immature, Huachuca Mountains, August 13.

This species occurs also in New Mexico, one of the specimens recorded as *Litaneutria minor* by Scudder and Cockerell^a being this species. I also have it from Las Vegas Hot Springs, New Mexico, August 11, and Dimmit Lake, New Mexico, August 21, all collected by Cockerell.

LITANEUTRIA MINOR Scudder.

There are specimens of both sexes in the collection of the U. S. National Museum. From a study of Scudder's original specimens it is seen that the four species now contained in our lists are very nearly allied to each other. *Obscura* and *pacifica* are scarcely distinct from *minor*, and *borealis* is retained with much doubt, being known only from the female, and separable from typical *minor* only by the smoother pronotum, a variable character. These nominal species are separable as follows:

1. Wings of the males without a subbasal fuscous spot.....*pacifica*.
Wings of the males with a subbasal fuscous spot2.
2. Wings of the males quite deeply fuliginous throughout.....*obscura*.
Wings of the males, aside from the subbasal fuscous spot, lightly fuliginous ...3.
3. Pronotum roughened in the female*minor*.
Pronotum smoother in the female*borealis*.

Typical *minor*, represented in the U. S. National Museum by six males and six females from Colorado, Arizona, and California, has the wings of the males lightly fuliginous, rarely if ever completely hyaline. This infuscation is variable and merges into the *obscura* type.

Obscura, represented in the national collection by four males and four females from Arizona and California, has the wings of the males wholly infuscated more deeply than in typical *minor*. The elytra is also usually much darker and the veins more distinctly marked with black than in *minor*. One specimen from California, however, has the elytra light colored as in *minor*, and this specimen has the anal are of the elytra infuscated at the base.

Pacifica, not represented in the collection of the U. S. National Museum, has the wings of the males feebly and uniformly fuliginous, the subbasal fuliginous spot not represented.

^a Proc. Davenport Acad. Sc., IX, 1902, p. 10.

Borealis, represented by two females from Colorado, is scarcely distinguishable from *minor*, the pronotum of the female being somewhat less tuberculous than in typical *minor*. The female elytra also seem slightly more elongate in the specimens before me.

The length of the elytra of these insects varies considerably in the males, the maximum being 22 mm. and the minimum 16 mm. The few specimens before me, however, exhibit a complete gradation from the greatest to the smallest measurement. The females have the wings infuscated mesially for nearly their entire width. As a rule the females, being inseparable, must be placed according to their locality unless associated with the males. A sufficient amount of fresh material would very probably justify the reduction of one or more of these species to the rank of variety.

STAGMOMANTIS LIMBATA Hahn.

Nine males, Nogales, June 15, August 3; one male, one female, Huachuca Mountains, June 29, August 13. Two immature females, Catalina Mountains, June 6.

This species is readily distinguished from *carolina* by the female having the costal area of the elytra much broader and by that of the male being opaque instead of transparent or translucent, as in *carolina*.

BACTROMANTIS VIRGA Scudder.

Four males, Huachuca Mountains, August 15. Four males, Nogales, June 15, July 19.

These specimens are larger than a single male specimen in the U. S. National Museum from Phoenix, Arizona. The elytra of this latter measures but 21 mm. and the pronotum 9 mm., while the elytra of the former measure 24 to 26 mm. and the pronotum 11 mm., except one of the specimens from Huachuca Mountains, which is scarcely larger than the one from Phoenix.



FIG. 2.—*VATES TOWNSENDI*, SIDE VIEW.

VATES TOWNSENDI Rehn.

Vates townsendi REHN, Proc. U. S. Nat. Mus., XXVII, 1904, p. 573.

Two males, Nogales, June 14, July 18.

The first reference of the occurrence of this handsome insect within the United States was by the writer in February, 1903,^a under the

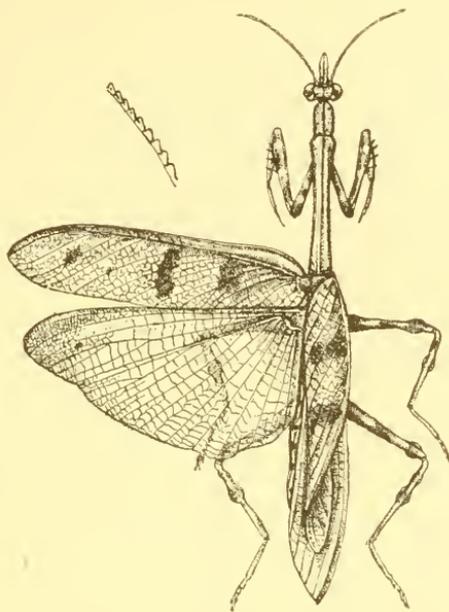


FIG. 3.—*VATES TOWNSENDI*, TOP VIEW.

name *Vates* sp., the record being based upon an immature specimen. A figure of the adult male, made from these Arizona specimens, has already been published and is here reprinted.^b

PARABACILLUS COLORADUS Scudder.

One male, Huachuca Mountains, August 15.

SYRBULA FUSCOVITTATA Thomas.

Two males, Huachuca Mountains, August 17. Altitude, 8,000 feet.

HESPEROTETTIX CURTIPENNIS Scudder.

One male, Hot Springs, July 2. Two females, Flagstaff, Arizona, June 7 (Barber and Schwarz, collectors).

This species was described from females taken in Colorado, and until now the male has remained unknown.

Description of male.—General color greenish. Head moderately prominent, green with a darker green line above and paler next the eyes above; vertex moderately tumid, slightly elevated above the pronotum; interocular space less than the width of the basal segment of

^aProc. Ent. Soc. Wash., V, 1903, p. 165.

^bJourn. N. Y. Ent. Soc., XIII, 1905, pl. III.

the antennæ: fastigium rectangular, very declivate, moderately sulcate with the bounding carinæ rounded; frontal costa just failing to reach the clypeus, moderately sulcate, more deeply between the antennæ, about as broad as the interocular space with sides parallel to near the vertex, where they converge to meet the fastigium. Eyes moderately large and prominent, considerably longer than the infraocular portion of the genæ. Antennæ rufotestaceous, obscure basally, about twice as long as the pronotum, apically blunt. Thorax rounded, sides parallel, scarcely expanded posteriorly, color greenish with a slender light dorsal line, and the lateral lobes marked with an elongate black spot terminating at the posterior sulcus and not quite reaching the anterior margin of the pronotum and bordered below with an ashy stripe; prozona nearly smooth; metazona somewhat rugulose, slightly punctate; anterior margin of the pronotum roundly truncate, hind margin obtuse angulate, the angle a little rounded; lateral carinæ not represented, median carina subobsolete, scarcely noticeable except on the metazona and there inconspicuous; transverse sulci slender but well developed, not lined with black; prozona nearly twice as long as the metazona. Prosternal spine short, pyramidal, well pointed and erect; interspace between the mesosternal lobes subquadrate, a little longer than broad; interspace between the metasternal lobes elongate, much longer than broad. Elytra abbreviate, scarcely as long as the pronotum and just touching each other above, scarcely overlapping, apically roundly pointed, the costal margin well rounded; color uniformly green; wings aborted. Fore and middle femora considerably and equally swollen, light brown in color; tibiæ and tarsi dark green, spines black; posterior femora moderately stout, uniformly green on the outer face, lighter below and on the inner face, rufescent above, unbanded; posterior tibiæ and tarsi greenish blue, the spines tipped with black, ten to eleven in outer series. Abdomen brownish above and below, very faintly tinged with greenish, apically scarcely swollen and very little upturned; supraanal plate triangular, centrally elevated and briefly and broadly sulcate, the tip beyond the median elevation with a slight but deep sulcus; furcula mere projections, no longer than broad, lying within the bounding walls of the median sulcus of the supraanal plate; cerci just reaching the tip of the supraanal plate, simple, tapering throughout, more rapidly in the basal half, the tip sharp and moderately incurved; subgenital plate no longer than broad, the subapical tubercle prominent.

Length 17 mm., antennæ 9 mm., pronotum 4.5 mm., elytra 3.5 mm., posterior femora 9.5 mm.

PSOLOESSA BUDDIANA Bruner.

One male, three females, July 17 to 30.

A female type of this species is in the U. S. National Museum and, like this series, it has the foveolæ visible from above for their entire length, thus differing from the other United States members of the genus, and in this respect allied to the genus *Stirapleura*, where indeed it may belong. The pronotal structure, however, is that of *Psoloessa*. Except for the wholly visible foveolæ, some of the specimens are very close to *P. ferruginæ*, but most are much darker than that species.

STIRAPLEURA PUSILLA Scudder.

One male, Huachuca Mountains, August 15. One female, Nogales, July 1.

ARPHIA ABERRANS Bruner, new species.

One male, one female, Nogales, June 24 to 29. One male, two females, Huachuca Mountains, August 12 to 27.

Professor Bruner has very kindly sent me the following description of this species, which he has previously recognized from a single female taken in the Huachuca Mountains by Mr. Kunzé.

His description is as follows:

ARPHIA ABERRANS, new species.

A rather slender, long-winged, grayish brown, profusely mottled insect with greenish-yellow wings and rather conspicuously banded hind femora.

Head of moderate size, about as wide as the front edge of the pronotum; the vertex gently depressed, its scutellum shallowly sulcate, oval (male) or pyriform (female), the bounding walls fairly prominent but not high; lateral foveolæ triangular, inconspicuous, rather flat and more or less filled with rugosities or coarse granules, frontal costa plane, scarcely sulcate, narrowing above to little less than its width at the ocellus and gradually merging into the sulcation of the vertex. Antennæ filiform, of moderate length. Pronotum a little constricted in advance of the principal sulcus, the disc moderately coarsely granulate; median carina fairly prominent, straight, cut in advance of the middle; anterior margin a little angulate, the hind margin right-angled. Tegmina of medium width, extending considerably beyond the tip of the abdomen in both sexes, the intercalary vein not especially prominent. Hind femora neither very heavy nor especially slender; about normal for insects of the group.

General color above, light grayish brown, profusely and rather evenly mottled and streaked with dark brown and dull black; below pale testaceous, the dorsum of the abdomen bluish tinged. Dorsum of prothorax obscurely decussate with paler, the sides and head back of eyes longitudinally streaked alternately with darker and paler dashes of brown and gray. Tegmina with the dorsal edge paler and nearly destitute of the otherwise rather general dusky markings. Wings transparent greenish-yellow on disc and along the anterior field nearly to the apex, the latter portion vitreous; fuliginous band rather broad but pale and broken by the radial veins, not quite reaching the anterior edge; terna quite prominent and reaching nearly to the base. Hind femora thrice obliquely banded with fuscous internally

black banded with testaceous, below blue tinted; tibiae bluish with a rather broad, pale basal annulus, the tarsi testaceous.

Length of body, male 21, female 29 mm.; of antennae, male 7, female 7.5 mm.; of pronotum, male 4.85, female 5.5 mm.; of tegmina, male 23, female 25 mm.; of hind femora, male 12, female 15 mm.

Habitat.—North America, Huachuca Mountains, Arizona, 1 female (R. E. Kunz⁶); Nogales, Arizona, 1 male, 1 female; Huachuca Mountains, 1 male, 2 females, Oslar (Coll. U. S. Nat. Mus.).

Type.—Cat. No. 8258, U.S.N.M.

This insect reminds me very much of some of the pale winged species of *Trimerotropis*, to which it bears a strong resemblance at first glance. The species seems to be rather local in its distribution, but may occur across the boundary line in Mexico as well.

HIPPISCUS CORALLIPES Haldeman.

One female, Catalina Mountains, June 6.

Scudder, in his table,^a says the inside of the hind femora is blue, but the original description gives it as bright vermilion. This specimen from Catalina Mountains agrees with the original description. *Hippiscus conspicuus* is nearly allied to this species.

LEPRUS CYANEUS Cockerell.

One female, Nogales, August 1.

LACTISTA OSLARI, new species.

One male, Nogales, July 3.

Description.—Ashy gray, heavily mottled with brown. Head scarcely prominent, no wider than the posterior portion of the pronotum, brown above, the lower half paler; vertex little elevated and with two oval areas bounded by well-elevated carinae, less distinctly so in front where they join the elongate, somewhat declivate fastigium, which is deeply sulcate and with the bounding walls well elevated, fastigium without median carina; interocular space not quite as broad as the width of one of the eyes, nearly twice as wide as the basal segment of the antennae; frontal costa percurrent, somewhat narrower than the interocular space, sulcate at and below the ocellus, flat and lightly punctate above the ocellus and angularly expanded at the intersection with the fastigium. Eyes moderate, quite prominent, about as long as the infraocular portion of the genae. Antennae brown, about as long as the head and pronotum. Thorax compressed, slightly widening behind; color brownish, with very obscure darker flecking on the sides; surface smooth, except on the disk where it is slightly rugose, anterior margin scarcely angulate, posterior margin acute-angulate, the apex quite sharp; lateral lobes slightly deeper than long, the posterior-inferior angle broadly rounded; lateral carinae rounded, subobsolete and broken before the

^a Psyche, VI, 1892, p. 278.

principal sulcus, more distinct and sharp on the metazona; median carina percurrent, considerably and evenly elevated, subcristate, cut by one sulcus only; transverse sulci cutting the lateral carinae and well developed on the lateral lobes. Interspace between the mesosternal lobes half as broad again as long, of metasternal lobes quadrate. Tegmina moderately slender, intercalary vein well developed and apically nearer the median than the ulnar vein, color brownish with a large, light-gray rectangular spot on the costal area just beyond the humeral angle and a trace of the same color before the angle and also beyond the costal spot; the lower portion of the tip is transparent membranous, and the whole elytra is marked with darker blotches. Wings broad, about two-thirds as broad as long; basal half, or a little more, yellow, followed by a moderately broad fuscous band which fails to reach the anal angle below, interrupted narrowly at the first anal vein and sending a tenia about half way to the base; beyond the fuscous band the wing is transparent with fuscous veins and with the apex again becoming infuscated; stigma fuscous. Legs moderately slender, fore and middle pairs brownish mottled lightly with fuscous; posterior femora with two black bars across the dorsal surface, scarcely extending across the brownish outer face, which has a pregenicular ashy band; inner face black with a broad pregenicular light band; geniculations black on the inner side, fuscous on the outer; hind tibiae blue with a light-colored basal band; spines black to the base, nine to ten in outer series. Abdomen light brown, darker above, moderately slender.

Length 18 mm., antennae 7.5 mm., pronotum 4.25 mm., elytra 19 mm., posterior femora 10 mm., greatest width of elytra 4 mm., wing 11 mm.

Type.—Cat. No. 8261, U.S.N.M.

I have also a female taken by Oslar at Albuquerque, New Mexico, without date. It is like the male, except the pronotum is somewhat more rugose and the tips of the wings are less infuscated. It measures as follows: Length 22 mm., antennae 7.5 mm., pronotum 5 mm., elytra 23 mm., greatest width of elytra 4 mm., of wings 11.5 mm.

Professor Bruner says this is near to, but distinct from, *L. gibbosus*. He also compared it with *pellepidus* and *punctatus* and found it different. The *L. boscanus* of Rehn has also been seen.

The insect recorded from New Mexico by Scudder and Cockerell^a as *Lactista pellepidus* is *Tomomotus aztecus*, as determined by careful comparison of those specimens in the Scudder collection with typical *aztecus* from Texas identified by Bruner.

^aProc. Davenport Acad. Sc., IX, 1902, p. 31, pl. III, fig. 1.

TOMONOTUS AZTECUS Saussure.

Two males, three females, Nogales, July 19 to 30. One male, one female, Huachuca Mountains, August 12 to 15.

Besides these specimens, the U. S. National Museum contains specimens from Organ Mountains, New Mexico, taken by Townsend at an elevation of 5,700 feet in Filimore Canyon and a few specimens from the same region by Cockerell in September.

TOMONOTUS FERRUGINOSUS Bruner, new species.

Two males, two females, Huachuca Mountains, August 11 to 18. One female, Nogales, no date.

Professor Bruner has furnished the description and following table of species of *Tomonotus* of *T. ferruginosus* in advance of their publication in his work in the *Biologia Centrali-America*, Orthoptera, II.

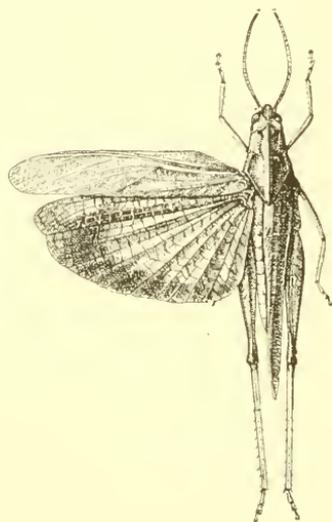


FIG. 4.—*TOMONOTUS FERRUGINOSUS*,
TOP VIEW.

Description.—In general structure nearest to *T. mexicanus* Saussure, but differing from that insect in its somewhat slenderer form, less strongly granulous head and thorax, in the more elongate and angulate pronotum, the longer and narrower antennae, the plain unbanded hind tibiae and hind femora, and in being of a uniform ferruginous color throughout instead of having the tegmina and body mottled and marbled with fuscous. The present species also differs from the insect with which it has been compared in having the wings tile red instead of rose color and the margin along with the shorter and less conspicuous tenia smoky brown instead of fuliginous. Its hind tibiae vary from pale greenish yellow, female, to glaucous, male, while in *mexicanus* these members are pale and dark banded as in *Spharagemon bolli*.

Length of body, male 20 mm., female 32 mm.; pronotum, male 6.5 mm., female 8.5 mm.; antennae, male 8 mm., female 10.5 mm.; tegmina, male 20.5 mm., female 28 mm.; hind femora, male 13 mm., female 17 mm.

Habitat.—Fort Grant, Arizona (Collector L. Bruner); Santa Rita Mountains, Arizona (E. A. Schwarz); Phoenix, Arizona (R. E. Kunz); Huachuca Mountains, Arizona (E. J. Oslar); California (A. Koebele).

TABLE OF SPECIES OF THE GENUS TOMONOTUS.

- A. Tegmina with their apices obliquely truncate. Head and pronotum rather roughly granulose; the scutellum of the vertex gently declivent; wrinkled. Eyes smaller. Pronotum cristate or suberistate, decidedly angulate in front. Wings some shade of red, the band following the border to anal angle. Spurs of the hind tibiae rather unequal in length, the outer ones being much shorter than the inner. Antennae decidedly flattened.
- B. Pronotum strongly compressed, elevato-lamelliformly cristate, this strongly and obliquely fissured; the anterior and posterior edges both angulate, upper carina of hind femora suddenly narrowed beyond the middle.

- C. Color variable, varying from cinereous to fulvo-fuscous mottled and mar-
 morate, with blacker dark brown. Wings rose color, with a narrow fuscous
 border and a prominent tænia reaching to the base; apex emarginately
 vitreous. Hind edge of disk of pronotum little acute. Hind tibiæ banded
 with fuscous and testaceous.....*mexicanus* Saussure.
- C C. Color uniformly ferruginous, without darker mottling, and marbling.
 Wings tile color, the fuscous border faint, the tænia inconspicuous and
 not reaching the base of the wing, the apex not perceptibly hyaline.
 Hind edge of disk of pronotum decidedly acute. Hind tibiæ unicolor-
 ous, pale testaceous to glaucous.....*ferruginosus*, new species.
- B B. Pronotum above plane, more gently cristate, the severing not oblique; ante-
 rior edge very obtusely angulate, behind subacute. Wings bright car-
 mine, the tænia and border deep black; apex emarginately vitreous.
 Upper carina of hind femora not suddenly narrowed.....*arizaba* Saussure.
- A A. Tegmina with their apices rounded. Head and pronotum less strongly gran-
 ulate; scutellum of the vertex more strongly declivent, smoother. Eyes
 larger. Pronotum carinate, but in nowise cristate; the anterior border sub-
 truncate. Wings yellow, the fuscous band not reaching the anal angle.
 Spurs of hind tibiæ not greatly unequal.....*aztecus* Saussure.

The above-described new species is very like a red winged *Arphia*,
 so much so indeed that it is very liable to be taken as such. The
 sternal characters serve, however, to separate it from the members of
 that genus.

MESTOBREGMA GRACILIPES, new species.

Two males, Nogales, June 30, July 21. Two females, Huachuca
 Mountains, August 25 and 27.

Description.—Light gray, conspicuously marked with fuscous.
 Head prominent, strongly elevated above the pronotum; color fuscous
 above with longitudinal light stripes, in front and below ashy with the
 face ornamented with a V-shaped black mark beginning below each
 eye and meeting on the clypeus; the sides are also marked with a
 horizontal black line parallel with the side of the V-shaped mark but
 much less conspicuous; vertex flat, inclined upward and at vertex
 between the eyes with an interrupted transverse carina; interocular
 space about as broad as one of the eyes in the female and scarcely as
 broad in the male, about twice as broad as the basal segment of the
 antenna; fastigium of the vertex declivate, moderately sulcate with
 well-elevated walls, narrowing anteriorly to meet the walls of the
 frontal costa from which it is not separated by transverse carinae;
 media carina absent; frontal costa not reaching the clypeus, at
 narrowest point, above the ocellus, about one-third as broad as the
 interocular space, male, or about one-fourth as broad, female, deeply
 sulcate, the walls well elevated and diverging uniformly. Eyes very
 prominent, hemispherical, about as long, male, or not as long, female,
 as the infraocular portion of the genæ. Antennæ rufotestaceous,
 slender, slightly, female, or considerably, male, longer than the head

and pronotum. Thorax mesially somewhat compressed, disk clepsydral in shape and markings, the marking light on dark background; lateral lobes higher than broad, the lower margin descending, causing posteroventral angles to be acute, though not very sharply so; color fuscous on disk, margined above and behind with ashy and a more or less distinct square spot of the same color on the anterioventral angle and a slight semicircular spot on the center of the disk; anterior margin of the disk truncate, posterior rectangular, the sides straight; median carina distinct, equally elevated throughout, cut a little in front of the middle by the principal sulcus and in front of that point cut very inconspicuously by the anterior sulcus; lateral carinae slight and the lateral lobes furnished about the middle of the upper half with a short longitudinal carina, not reaching the anterior margin of the pronotum and terminating at the anterior sulcus; interspaces between the mesosternal and metasternal lobes about twice, male, or more than



FIG. 5.—*MESTOBREGMA GRACILIPES*, TOP VIEW.

twice, female, as broad as long. Elytra long and slender, nearly seven times as long as broad; color light with a large triangular fuscous spot at the humeral angle, a quadrate spot about the same size located its own width from the triangular spot on the costal margin and three or four less conspicuous rounded spots beyond on the costal area; the tip of the elytra is membranous with the veins infuscated, the anal area pallid, basally infuscated in male and wholly obscured in the female; intercalary vein well developed. Wing long and pointed, about twice as long as broad, transparent with the basal fifth washed with citrus, a bluish costal stigma

beyond the middle, no trace of a transverse fuscous band. Legs weak and very slender, the anterior and intermediate femora scarcely more than one-half as broad as the interocular space, color light gray with darker mottlings; posterior femora slender, pallid with the inner face infuscated basally and the outer face with a short median black streak and the dorsal surface marked with three oblique black spots, conspicuous but small; hind tibiae light yellowish, the spines black tipped, seven to ten or eleven in outer series. Abdomen slender, pale yellowish, more or less infuscated above and, in female, on the sides.

Length of body, male 17 mm., female 23 mm.; antennae, male 9 mm., female 9 mm.; pronotum, male 3.5 mm., female 4 mm.; elytra, male 17 mm., female 23 mm.; posterior femora, male 10.5 mm., female 13 mm.; greatest width, elytra, male 2.5 mm., female 3.5 mm.; wing, male 7.5 mm., female 10 mm.

Type.—Cat. No. 8259, U.S.N.M.

This species is allied, in shape of wings, to the *M. rosaceus* of Scudder, of which my *Arwopteryx pendopæ* is a synonym as determined by direct comparison with Scudder's type. *Pendopæ* has been referred to by Rehn as synonymous with *Trepidulous rosaceus* McNeill. This species, as well as the one here described and certain others, are apparently generically distinct from typical *Mestobregma*, and either *Trepidulous* or *Arwopteryx* should properly be applied to them, depending upon whether or not *Trepidulous* is the same as *Arwopteryx*. The type of *Trepidulous* should be in the U. S. National Museum, but, like a lot of other type material, was retained by the describer, all efforts toward having it returned so far failing.

MESTOBREGMA PLATTEI Thomas.

One male, two females, Nogales, July 30.

CONOZOA SULCIFRONS Scudder.

Five males, one female, Nogales, July 15 to 31. Two males, Huachuca Mountains, August 20.

TRIMEROTROPIS ALLICIENS Scudder.

Trimerotropis alliciens SCUDDER, Proc. Davenport Acad. Sc., IX, p. 37, pl. 11, fig. 1, 1902.

Two males, Nogales, July 31.

These specimens were compared with Scudder's types. Except for the elytral bands being a very little more distinct in the type specimens there seems to be no difference between them.

TRIMEROTROPIS BRUNERI McNeill.

Two males, July 21, August 2. One male, one female, Huachuca Mountains, August 11 to 13.

Trimerotropis fasciula is quite certainly not distinct from this species and *T. modesta* is probably but a stronger marked form of the same.

TRIMEROTROPIS CYANEIPES Bruner.

Four males, seven females, Huachuca Mountains, August 12 to 20.

These were taken at an altitude of 8,000 feet. One of the males has the blue disk of the wing deeply tinged with sea green.

TRIMEROTROPIS LATICINCTA Saussure.

One male, five females, Huachuca Mountains, August 12 to 29. Two females, Nogales, July 11 to 21.

Taken at an altitude of 8,000 feet. Some specimens of this species rival *melanopleura* in the width of the wing band.

TRIMEROTROPIS VINCULATA Scudder.

Four males, five females, Huachuca Mountains, August 11 to 25. Twenty-three males, sixteen females, Nogales, June 17 to August 2. Six males, one female, Patagonia Mountains, May 15. One male, two females, Catalina Mountains, June 6.

This series is very uniform in coloration, but shows considerable variation in shape of the thorax, some having the pronotum much longer and more slender than others, the short broad form approaching McNeill's *sarutilis*.

HADROTETTIX TRIFASCIATUS Say.

Six males, two females, Huachuca Mountains, August 12 to 29.

Some of these specimens are labeled as having been taken at an elevation of 8,000 feet.

HELIASTUS ARIDUS Bruner.

One female, Huachuca Mountains, August 12.

The collection also contains a female from Albuquerque, New Mexico.

HELIASTUS BENJAMINI, new species.

One male, one female, Huachuca Mountains, August 16. One female, Nogales, July 5.

Description.—General color reddish brown, elytra banded with black, and the wings red in basal half. Head moderately prominent, color reddish brown above, lighter on the genæ and face; vertex scarcely tumid, somewhat elevated above the pronotum, especially in the male; interocular space considerably less than (male) or almost as (female) wide as the width of one of the eyes; fastigium moderately declivent, the bounding walls slight but distinct, no median carina; lateral foveolæ faintly impressed elongate triangular spaces, below each of which is a very distinct ocellus; frontal costa not nearly reaching the clypeus, about two-thirds as broad as the interocular space, expanded at the ocellus, also somewhat expanded at the lower extremity and above where it joins the vertex, the boundary walls but little elevated but sharp and distinct; eyes prominent, more so in the male, as long as (male) or considerably shorter (female) than the infraocular portion of the genæ; antennæ fuscous, basally more or less rufotestaceous, about (female) or more than (male) as long as the head and pronotum. Thorax rounded, broadening slightly posteriorly, quite uniformly reddish brown, the lateral lobes sometimes, not always, with a whitish central spot; surface smooth, slightly punctate on the metazona; lateral lobes as deep as long, the posterior-inferior angle rounded; lateral carinae obsolete or, on metazona, bluntly indicated; median carina indicated only on the metazona, and there linear; transverse sulci well developed on lateral lobes, the posterior one dividing

the pronotum into nearly equal parts, the posterior probably a little the longer, at least in some females; interspace between the mesosternal lobes nearly twice (male) or more than twice (female) as long as broad, between the metasternal lobes slightly broader (male) or twice as broad (female) as long. Tegmina moderately slender, extending nearly a fourth of their length beyond the tips of the posterior femora; basally densely reticulate, apically more coarsely reticulate and membranous; color reddish brown, marked at the location of the humeral angle with a solid brownish-black band reaching completely across the elytra; beyond this transverse band are a number of more or less distinct blotches of a brownish color. Wings with the basal half red, except an obscure tænia interruption; beyond the colored disk the wing is transparent with infuscated veins, transverse fuscous band barely indicated; stigma fuscous, about one-fourth as long as the wing. Posterior femora stout and heavy, outer face brownish, with a moderately broad blackish bar across near the base of the outer half, faint in the female; inner face of the hind femora light in color with two broad, black transverse bars, the basal one sometimes extending to the base; hind tibiae yellowish basally, the inside blackish, ringed just before the middle more or less distinctly with black and beyond red; spines black tipped, eight (male), six to seven (female) in outer series; tarsi yellowish brown, tinged with red, usually decidedly reddish. Abdomen reddish brown, parallel not apically swollen in the male; valves of the female

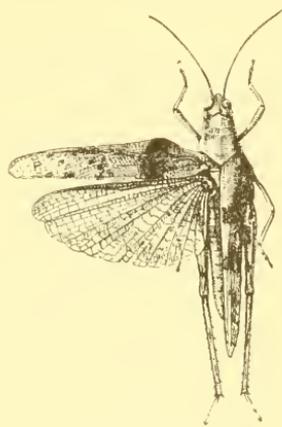


FIG. 6.—HELLASTUS BENJAMINI.

ovipositor unarmed, considerably scooped out; male subgenital plate apically acutely elevated a little above the supraanal plate; supraanal plate subtriangular, sides somewhat rounded, centrally tumid at the base, and with a short basal sulcus, scarcely more than one-fourth as long as the plate itself. Cerci simple, rapidly tapering in the basal half, the apical half scarcely half as broad as the basal portion.

Length, body, male 19 mm., female 25 to 30 mm.; antennæ, male 12 mm., female 12 mm.; pronotum, male 4 mm., female 5.5 to 6 mm.; elytra, male 19 mm., female 23 to 24.5 mm.; posterior femora, male 11 mm., female 13 to 14 mm.; width at widest part, elytra, male 3.5 mm., female 5 mm.; wing, male 9.5 mm., female 11.5 mm.

Type.—Cat. No. 8260, U.S.N.M.

This species resembles somewhat the variety of *H. sumichrasti* described from Texas, but is more robust, has stouter posterior femora and has the elytra more distinctly banded. Mr. Rehn says the body is still smoother in *H. astecus*, with which he kindly compared these

specimens. He further states that the elytral band is less distinct and the legs more slender in *aztecus* than in the species here described.

I take pleasure in naming this handsome insect in honor of Dr. Marcus Benjamin, the editor of the Proceedings of the United States National Museum.

SCHISTOCERCA CARINATA Scudder.

Recently Doctor Kimz6 submitted to me for identification a pair of this species taken by him at Phoenix, Arizona, October 11 and 18. They are now in the National Museum.

SCHISTOCERCA SHOSHONE Thomas.

One female, Huachuca Mountains, August 29; altitude, 8,000 feet.

SCHISTOCERCA VEGA Scudder.

Three males, Huachuca Mountains, August 22 to 27; six males, four females, Nogales, June 29 to July 19; four females, Oracle, June 9 to 12; two females, Catalina Mountains, June 6; one female, Patagonia Mountains, May 15.

While the females of this species seem quite uniform in size the males are quite variable in this respect. The extreme measurements exhibited by the males in this series, which perfectly intergrade, are as follows: Pronotum, 6 mm. to 8.5 mm.; elytra, 33 mm. to 44 mm.; posterior femora, 16.5 mm. to 22 mm.

Aside from the maculate lateral lobes of the prothorax and the more heavily maculate elytra, *vega* is very similar in appearance to *S. carinata*.

SCHISTOCERCA VENUSTA Scudder.

One female, Huachuca Mountains, August 15.

This species is very similar to *S. shoshone*, and should probably be considered as but a variety of it. The separating character, the median stripe of the pronotum, varies from conspicuous, typical *venusta*, to absent, typical *shoshone*.

CONALCAEA NEOMEXICANA Scudder.

One male, Huachuca Mountains, August 17.

The antennae are nearly as long as the posterior femora and are infuscated at the base and tip, the median portion reddish. The interspace between the mesosternal lobes is nearly twice as long as broad. The measurements of this specimen are as follows: Antennae, 12 mm.; thorax, 5 mm.; elytra, 4 mm.; posterior femora, 13.5 mm.

HORMILIA ELEGANS Scudder.

One female, Huachuca Mountains, August 15. One female, Catalina Mountains, June 6.

The specimen from Huachuca Mountains was taken at an altitude of 8,000 feet.

SCUDDERIA MEXICANA Scudder.

Three males, two females, Nogales, June 1 to July 30. One female, Huachuca Mountains, August 18.

MICROCENTRUM RETINERVE Burmeister.

Ten males, Nogales, June 17 to July 22.

CACOPTERUS PUNCTATA Scudder.

One immature male, Nogales, July 13.

CEUTHOPHILUS CALIFORNIANUS Scudder.

One male, Huachuca Mountains, August 18.

GRYLLUS PENNSYLVANICUS Burmeister.

One male, Patanonia Mountains, May 15. One female, Nogales, July 13.

GRYLLUS PENNSYLVANICUS var. NEGLECTUS Scudder.

One male, two females, Huachuca Mountains, August 16 to 23.

This is very surely the insect described many years ago by Mr. Scudder under the name *Gryllus neglectus* and recently referred by him to the synonymy under *pennsylvanicus*. It is not a distinct species, but is a very good variety. Professor Morse, of Wellesley, in conversation with the writer some months ago, said that he was informed by Doctor Scudder that, owing to the misreading of a scale, some of his, Scudder's, early descriptions contained measurements one-half too small. This quite probably explains the unusually short ovipositor and hind femora of the type of *neglectus*.

That Blatchley's *G. americanus* is a synonym of this species is quite certain. The Scudder collection contains a number of specimens referable to *neglectus* and they seem specifically similar to *americanus*, of which Professor Blatchley has kindly sent me cotypes.

GRYLLUS PERSONATUS Uhler.

Two males, seven females, Nogales, July 13 to August 3. One male, Huachuca Mountains, August 22. One female, Oracle, June 9. Two immature females, Nogales, June 17.

CECANTHUS NIGRICORNIS Walker.

Two nymphs, Huachuca Mountains, August 13 to 18.