STUDIES IN THE MALACHIIDAE V.

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The present number of these Studies is largely the result of examination of some four thousand specimens of Malachiidae, belonging to the California Academy of Sciences. This material constitutes the bulk of the Academy's collection in this family, except for the genus *Attalus,* which I examined in connection with Studies III (1), and also includes the Ralph Hopping collection of Malachiidae.

Collops Erichson

Collops subaeneus Fall

In 1912 Fall (2) described this species from a unique female and the male has remained unknown, so far as I am able to determine, to the present time. I have a male specimen which I shall describe as the allotype of the species. A single female from Lake Town, Utah differs from Fall's type in having the prothorax entirely rufous, except for two small dorsal spots, about as in *bipunctatus* (Say) and the first two antennal segments entirely testaceous, with the remaining segments slightly infuscate. The clypeus and a trilobed frontal area also testaceous and the tarsi rufotestaceous.

Male. Similar to the female, except as follows. The reflections on the elytra especially toward the base are purplish rather than aeneous. The clypeus and the labrum are testaceous and there is a rounded yellow spot between the antennal foveae. The foveae are definitely larger than in the female and markedly narrow the anterior margin of the front. The antennae are piceotestaceous except for the two basal segments which are testaceous. On the first two pairs of legs, the distal tips of the tibiae and the basal joints of the tarsi are piceotestaceous. The first antennal segment is elongate triangular, viewed from the front, twice as long as broad, without teeth, the anterior surface strongly convex, the posterior concave or sinuate; the second segment very large, twice as broad as long, the posterior margin strongly produced, the tooth on the anterior face long and acute, the appendix heavy, elongate and curved at the tip; the third segment elongate triangular, peduncuIate, twice as long as the following, which are strongly serrate. Length 4.0 mm.

Allotype, male, collected at Woodland, California, V-13-33, by E. C. Zimmerman, in the collection of the California Academy of Sciences.

Collops granellus Fall

This species very rarely has the elytral vittae completely divided rendering the specimen quadrimaculate. Such specimens may be distinguished from any of the normally quadrimaculate species by the fine tuberculation of the elytral surface and from *laticollis* Horn in that the apical spots extend to the apical margins of the elytra. One such specimen, in which the vittae are narrowly divided, is in my collection, from Culberson Co., Texas and one, in which the vittae are broadly divided, in that of the California Academy of Sciences, from Globe, Arizona.

Collops balteatus Leconte
Collops oklahomensis Brown (new synonymy)

C. oklahomensis was described by Brown in 1928 (3) from one male and one female collected in Payne Co., Oklahoma. He states that it "is more closely allied to *balteatus* (than to *validus* Horn, with which he also compares it), with which it agrees in elytral coloration and in the form of the second antennal segment in the male." He separates it from *balteatus* mainly by the fact that the pronotum in *oklahomensis* is bimaculate, whereas in *balteatus* it bears a large, undivided discal spot. This last statement agrees with that of Fall (2) who places *balteatus* in Group C of his key, in the section with "prothorax with discal black spot." Fall states: "I have seen but few specimens and these exhibit almost no variation." Evidently all of his specimens had the undivided prothoracic discal spot and all of his specimens were from Texas.

There is before me a series of 27 specimens of *balteatus,* from Texas, Alabama, Florida and Oklahoma. In 14 of these the discal spot is completely divided and in 13 it is either solid or incompletely divided. In most of the latter group the tendency to division is indicated by a more or less pronounced emargination of the anterior and posterior borders of the spot. In the three or four classed as incompletely divided, there is a narrow yellow median line which is not clearly marked throughout its length. In those which have the thorax bimaculate, the separation of the two spots varies from a narrow yellow median line to the condition described in *oklahomensis,* in which "each spot is separated from apical and basal margin and from the other by approximately half its width." This variation is parallel to that which exists in *vittatus* (Say), except that in *vittatus* it proceeds still farther and furnishes specimens with completely immaculate prothorax. The three specimens in the above series from Oklahoma all have the prothorax bimacu-

late with the spots narrowly divided. The color of the legs varies from entirely black to the bicolored condition described in the male holotype of *oklahomensis,* the heavier pigmentation of the legs being usually associated with a heavier pigmentation of the prothorax.

The only other differences noted by Brown are: "In *oklahomensis* the first antennal segment of the male is more elongate and the elytral punctures are slightly less coarse than in *balteatus.*" These differences appear to be well within the limits of intraspecific variation.

Collops simplex Marshall

In 1951 (1) I described this species from a unique male from California. I now have a female from California which I have compared with the male holotype kindly loaned to me for that purpose by the California Academy of Sciences and am satisfied that the two are conspecific. The specimen from the Ralph Hopping collection was labeled by him "Malachius sp. Fall can't name."

Female. Similar to the male, except as follows. The elytra lack the violaceous tinge of those in the male and are black, with the apical margins broadly and the lateral margins very narrowly testaceous, the apical pale margins extending for a very short distance along the suture. Broad lateral margins of the prothorax rufotestaceous. The first two antennal segments and the legs (femora excepted) paler than in the male. The head is more oval than in the male and more prolonged behind the eyes, which are much smaller. This gives the appearance of the head being longer, in proportion to the width, but actual measurements show that the length-width ratio is the same in the two sexes, i. e., 1.0. The entire upper surface is alutaceous, as in the male. The pygidium is rounded, with a minute apical notch, as in the male. The last abdominal segment appears to be completely divided in the midline. Length 4.0 mm.

Allotype, female, El Mirador, Tulare Co., California, Apr. 12, Ralph Hopping collection, in the California Academy of Sciences, with the holotype.

This specimen could only be confused with the female of *punctulatus* Leconte, which is the only other described North American species with the entire upper surface alutaceous. In *punctulatus,* however, there is no appreciable sexual difference in the shape of the head and the size of the eyes. Also, in those specimens of *punctulatus* in which the apical and lateral elytral margins have become entirely pale, as in *simplex,* the sutural margins are also

entirely pale. The last abdominal segment in *punctulus* is also completely divided, but the pygidium is broadly emarginate.

The marked sexual difference in the shape of the head and size of the eyes, a difference which I do not find in other species of *Collops,* creates the suspicion that I may be mistaken in associating the present female with the male of *simplex.* If so, further collecting will disclose the error which easily can be corrected.

Collops knulli Marshall

This species was described by the present author (1) from a single male collected in Gillespie Co., Texas. Two females are before me now collected at Bastrop, Texas, about 75 miles east of Gillespie County, one of which is herewith described as the allotype of the species.

Female. Similar to the male, except as follows. The elytral spots are narrowly separated. The antennae are unmodified and very feebly serrate. The last abdominal segment is completely divided and the pygidium is broadly truncate. Length 3.5 mm.

Allotype, female, Bastrop, Texas, VI-12-29. J. O. Martin, collector, in the California Academy of Sciences. One parallotype, same data, in the author's collection. The parallotype has the elytral spots narrowly confluent, as in the male holotype and the abdominal segments are slightly darker than in the allotype.

Both sexes of this species can be easily separated from our other quadrimaculate species of *Collops* by the following characters: small size, elytral spots confluent or nearly so, legs pale, head pale anterior to the front margin of the eyes, the pale portion not separated clearly from the adjacent dark portion, the elytra finely and densely punctured and conspicuously pubescent.

Tanaops Leconte

This genus, obviously derived from *Attalus,* is apparently recent and in a stage of active evolutionary development. The situation is much the same as in the genus *Omus* (Cicindellidae) with numerous imperfectly differentiated forms of limited distribution, a great amount of variation especially as to color and frequent "intermediate" specimens which are difficult, if not impossible, to place accurately. All this renders *Tanaops* the most difficult genus to study yet at the same time the most interesting group of the family in North America. Transitional or intermediate specimens, however, are valuable as indicators of the relationships between the various species.

In my 1948 key (4) to the North American genera of *Malachiidae* I stated that in *Tanaops* the antennae are inserted "on the front, the antennal foveae distant from the clypeal suture by almost or quite the diameter of a fovea," as in the genus *Malachius*. A closer examination of several of the species shows that this statement was in error, arising from the fact that the clypeal suture in *Tanaops* is either indistinct or quite invisible. The clypeolabial membrane appears to be always extended in *Tanaops* and feebly chitinized, so that it is incapable of retraction, as in the other genera. Where the clypeal suture is visible, it shows that the anatomical position of the antennal fovea is the same as in *Attalus*, i.e., "at the front margin of the front, near the sides and contiguous to the clypeal suture." Since several species of *Atalus* have elongate heads and other species of the same genus have ventral abdominal pits, the only real distinction between the two genera is the formation of the second male protarsal segments, which, in *Tanaops*, do not possess free lobes extending over the following segment.

Tanaops sexualis n. sp.

Male. Oblong, slightly widened posteriorly. Black, the elytra becoming piceous toward the apex, the elytral apices, the posterior half of the sutural margins, the anterior half of the lateral margins, prosternum, anterior trochanters, first three abdominal segments and the central portions of the fourth and fifth rufotestaceous. Head 1.5 times longer than broad, the front feebly triimpressed; surface shining, punctures and pubescence spare, extremely fine and inconspicuous, the punctures more dense in the frontal impressions. Antennae long, passing the prothorax by about three segments, moderately serrate, the outer edges of the intermediate joints not sinuate. *Prothorax* quadrate, 1.2 times wider than long, the sides parallel, the anterior margin moderately produced, all the angles rounded, the impressions just inside the posterior angles distinct, surface and vestiture as on the head, with a few short, erect, black setae along the lateral and anterior margins. Elytra shining, slightly scabrous, the punctures fairly dense and very minute, pubescence very short, fine and visible only in an oblique light, erect black setae numerous and evenly distributed over the surface. The apices are broadly pale, the sutural pale stripe extremely narrow, the lateral stripes somewhat wider. Ventral surface densely and finely punctured, the pubescence much more conspicuous than on the dorsum. Ventral pits on segments four and five large, coalescent, with a blunt median carina or elevation at

the bottom of each pair. Pygidium small, the apex truncate. Length 3.7 mm.

Female. Similar to the male, except as follows. Elytra more strongly widened posteriorly. Uniformly black or piceous black above, without the pale elytral markings present in the male; anterior half of the lateral elytral margins just perceptibly paler. Piceous black beneath, except for the pale prosternum and posterior margins of the ventral segments. Apices of elytra smooth. Antennae shorter than in the male, scarcely serrate. Ventral segments unmodified. Length 4.0 mm.

Holotype, male and allotype, female, Big Sur, Monterey Co., California. VI-18-33, L. S. Slevin collection, in the collection of the California Academy of Sciences. Paratypes in that collection and in the collection of the author.

Described from a series of 17 specimens, 9 males and 8 females, 15 with the same data as the types, two from the same locality, but collected VI-26-28.

The color dimorphism, which suggested the specific name, is largely but not exclusively sexual in nature. Four of the nine males are colored as in the female type, whereas only one of the eight females shows the pale elytral markings of the male type and in this specimen the pale areas are definitely darker in tint, piceotestaceous and narrower, the pale sutural stripe being scarcely discernible. In the four otherwise normally colored male paratypes, the first three ventral segments are more or less heavily maculate or washed with piceous.

There are three other species with which the bicolored specimens of *sexualis,* mostly males, might be confused; *oregonensis, nunenmacheri* and *sierrae,* all described by the present author in 1946 (5). The first two of these are smaller species and in all three the males and females are similarly colored. In addition, the males of *oregonensis* are narrower and more parallel, the elytra are smoother and more shining and the prothorax is pale, with a narrow median stripe or spot. *Nunenmacheri* has the upper surface relatively dull and alutaceous, with practically no erect setae and the yellow markings are more extensive. The separation from *sierrae* offers more difficulties, since the two species are of the same size, shape and general appearance. Besides having the lateral elytral margins entirely pale, *sierrae* has the antennae more strongly serrate in both sexes and the male antennae at times have the intermediate segments moderately sinuate. So far as known, *sierrae* occurs only in the Sierra Nevada Mts., whereas *sexualis,* from Monterey County, is a coastal species. The unicolorous specimens, mostly

females, run to *coelestinus* in my 1946 key (5). This is also a smaller species, the elytra are bluish, granulate and with more conspicuous pubescence.

ANTHOCOMUS Erichson
Anthocomus horni (Fall)
Malachius antennatus Hopping (new synonymy)
Malachius rotgeri Marshall (subspecies)

This species is more variable both as to color and structure than existing literature would lead one to believe. The pale lateral thoracic stripes become narrowed in many specimens, giving a black thorax with narrow lateral margins pale. In some the thorax is entirely black. Likewise, the yellowish sutural angles of the elytra in both sexes become darker and the pale areas smaller until they are piceous in color and scarcely distinguishable from the rest of the elytra. In some, these areas disappear altogether and the elytra are black, with a faint aeneous or bluish luster. The smaller females of some of these dark specimens are easily confused with dark females of *mixtus* Horn and have been found mixed with the latter in several collections. They may be separated by the fact that the antennae are more strongly serrate in the females of *horni.*

Horn (6) and Fall (7), in their keys to the genus *Malachius,* both state that in *M. horni* (*spinipennis* Horn) the elytral appendages are not visible from above and the same statement appears in my key to *Anthocomus* (4), to which genus the species has been transferred. This is not true in a number of specimens that I find in the Hopping collection, especially those from the northern portion of its range in Oregon and British Columbia. Such specimens would run in my key (4) to *rotgeri* (Marshall) and a reexamination of the types of that species forces me to reduce it to the rank of a subspecies of *horni.* There are two series of *horni* in the Hopping collection, one seen by Fall in 1936 and designated by him as "new," the other set aside by Hopping and given a manuscript name. I was led astray by the previous statements of Horn and Fall as to the invisibility, from above, of the elytral appendages in *horni,* as were evidently also Hopping and Fall.

The Hopping collection contains two male and three female paratypes of *M. antennatus* Hopping, as well as five other females placed under this species, all from British Columbia. The only character of any consequence given by Hopping (8) to distinguish *antennatus* from *horni* is the form and length of the antennal pectinations. Horn (6) states that one of the two male specimens

from which he described the species *spinipennis* "has the antennae less distinctly pectinate" than the other and an examination of about 20 males of this species now available to me shows a considerable variation in the length and shape of the antennal pectinations, several of them having these pectinations equally as long and as distinctly clubbed as in the paratypes of *antennatus*. None of them, incidentally, has the pectinations as short and as broadly triangular as shown in Hopping's figure of the antennae of *horni*. I conclude that *antennatus* is a synonym of *horni*. The presence in my collection of specimens from Nevada, the antennae of which match those of *antennatus* almost exactly, would seem to preclude considering the latter as a subspecies.

Anthocomus mirandus (Leconte)

A series of over one hundred specimens in the Hopping collection demonstrates a degree of color variation in the female which has not been previously noted and which may cause some confusion in the matter of identification. Leconte (9), following his original description, states: "In the female there is a long common sutural spot, confluent each side with one extending nearly the whole length of the margin, forming a very wide band of greenish color," which he speaks of in the description as "fascia latissima e plagis tribus confluentibus composita." Leconte must have had a very unusually colored female before him, probably a single specimen, since among the seventy or more females in the present series, there is not one which displays such a fascia. Horn (10) states that the elytra are "variable in color from ocreous to blue, frequently the former color clouded with the latter." He says further that "in some unusually large specimens the aspect is that of *auritus*." He must have had some other species than *mirandus* when he made this statement. At any rate, in examining a good many hundreds of specimens of *mirandus* in the past several years, I have never seen one which at all resembled *auritus*.

The present series shows the following. The males have the elytra luteous or pale clay yellow in color, the sutural edges very narrowly black and the apices rufotestaceous or orange colored. Very rarely do the males show the variation to be described for the females. In the majority of the females, the elytra are colored as in the males, except that the luteous portion is more or less "clouded," as Horn states, or washed with a fuscous or bluish tint. In a very few females the entire elytra are a bright orange. In a minority of the females, approximately 20%, the black sutural

stripe is more or less dilated and a black spot appears near the posterior end of the lateral margins. The extreme of this variation gives specimens, about 5% of the total, in which the elytra are bluish black, with a median yellow vitta on each. Such specimens are easily confused with normally colored females of *macer* Horn. *Mirandus,* however, is a larger species than *macer* and the female antennae are more sharply serrate. Similarly colored males, which do occur rarely, may be easily distinguished from the males of *macer* by the appendiculate elytra.

Anthocomus theveneti (Horn)

Malachius contortus Fall (12) (new synonymy)

The recent examination of several dozen males of *theveneti* from California has convinced me of the correctness of this synonymy which I have suspected for some time. My original set of *contortus* from Alberta, Canada was identified by the late F. S. Carr and I have subsequently received the same form from Montana (the type locality), Idaho, Washington and British Columbia. *Theveneti* was decribed from southern California, but typical specimens occur also in northern California, Oregon and Nevada. Although I have not seen Fall's types of *contortus* for several years, I have no doubt as to the correctness of the identification of the Alberta specimens, which agree in every respect with Fall's description.

The only characters which Fall (12) gives in his description of *contortus* which serve to distinguish it from *theveneti* are the serrate antennae (pectinate in the typical male of *theveneti*) and the almost completely dark thoracic disc. The series of male *theveneti* referred to above shows the antennae vary from rather feebly pectinate to strongly serrate forms with the latter condition being indistinguishable in this respect from typical *contortus.* The species should be included in both the "pectinate" and the "serrate" sections of any key to the genus and when placed in the "serrate" section it runs immediately to *contortus.* The degree of darkening of the prothorax is notoriously unreliable as a specific character in this family. In most of the specimens of *contortus* the elytra are black, although in the type series they are "deep blue," as in *theveneti.* The form *contortus* might properly be retained as a northern subspecies of *theveneti,* were it not that specimens of *theveneti* occur in the San Francisco bay area with all the distinguishing characters of *contortus.* A careful examination of the elytral appendages which are unusually complicated and distinctive reveals them to be identical in both forms.

It is rather odd to note that Fall states: "In form, size and sexual characters this species (*contortus*) is almost precisely like *uniformis*" [name changed to *falli* when the species was transferred to *Anthocomus*] (4), but he does not compare it with *theveneti;* whereas in his description of *uniformis* (*inornatus*) (7), he states that this species "is nearest *M. auritus* and *M. theveneti.*" A glance at the elytral appendages of *auritus* shows that species to be quite distinct from the others under discussion, but the elytral appendages of *uniformis* are indeed quite similar to those of *theveneti.*

Anthocomus minutus n. sp.

Male. Oblong parallel, the elytra slightly widened posteriorly. Black, with faint bluish or greenish reflections, depending upon the light, the labrum, genae, antennae and tarsi piceous, broad lateral prothoracic margins rufotestaceous. Head short, front bi-impressed, frontoclypeal suture indistinct, surface shining, no punctures or pubescence visible. Antennae strongly serrate, the intermediate joints five-sixths as wide as long, extending almost to the middle of the elytra. Prothorax transverse, 1.4 times broader than long, the sides parallel, the anterior border moderately produced, all the angles rounded, a strong depression just within each posterior angle; the wide black median stripe extending semicircularly on each side into the pale lateral margin, in its middle third; surface shining, punctures and pubescence extremely fine. Elytra scabrous, the suture depressed, the puncturees not visible, pubescence pale, prostrate and so fine as to be visible only in an oblique light, no erect setae present. Elytral apices smooth, tridentate, the middle tooth on each at the same level as the rest of the elytron, the two lateral teeth at a lower level; the appendages small, roughly triangular, their apices directed mediad, narrowly visible from above, their upper surfaces rather densely pubescent and with an antemedian rib or thickening; the process contorted, also directed obliquely mediad, almost reaching the tips of the appendages. Ventral surface shining, very finely and moderately densely punctate, the pubescence more conspicuous than on the dorsum. Lobes of the last sternite large, leaving a small penile opening. Pygidium truncate. Length 2.7 mm.

Holotype, male, collected at Kaweah, California, by Ralph Hopping (no date given); from the Hopping collection in the California Academy of Sciences. Female unknown. No paratypes.

This specimen had been set aside by Hopping and labeled *Malachius minutus,* but not described. I have used Hopping's specific

name. It also bears a label "*Malachius* n. sp., near *pristinus*," probably a determination by Fall. It resembles *pristinus* Fall superficially, but can be easily distinguished by the much more strongly serrate antennae, the absence of yellow elytral tips and the differently formed elytral appendages.

Anthocomus pusillus n. sp.

Male. Elongate, oblong, parallel, the elytra semicircularly dilated just before the apex, as in *horni.* Piceous black, faintly aeneus, the mouth parts (except the basal portions of the clypeus and labrum, the mandibles and terminal joints of the maxillary palpi), the genae, lower surface of the first two antennal segments, wide prothoracic margins and elytral apices pale testaceous, under surface and legs piceous, the tibiae and tarsi slightly paler and the posterior border and center of the abdominal segments testaceous. Head broad, the front triimpressed, the central impression foveiform, the eyes large and prominent, the tempora longer than usual in the genus and rapidly converging posteriorly, the surface strongly shining, punctures and pubescence sparse and extremely minute. Antennae rather long, reaching about the basal third of the elytra, strongly serrate, the segments slender, the intermediate ones two-thirds as wide as long. Prothorax 1.2 times wider than long, the anterior margin arcuately produced, the sides slightly converging posteriorly, the posterior margin and basal angles moderately reflexed, surface and vestiture as on the head. Elytra feebly scabrous, shining, the individual punctures not visible, the pubescence sparse, extremely fine, no erect setae present. Elytral apices unmodified, the pale areas large and angulate anteriorly. Ventral surface minutely and densely punctulate, the pubescence more conspicuous than above. Pygidium with the apex only about one-half the width of the base, the apex narrowly truncate, but with the apical angles rounded, sparsely covered with long yellow pubescence. Length 2.5 mm.

Holotype, male, Carrville, Trinity Co., California, VI-16-1913, no collector's label, in the author's collection. Female unknown. No paratypes.

This specimen has been in my collection for several years, identified as *blaisdelli* Hopping. When the opportunity recently arose, however, to examine Hopping's paratypes of *blaisdelli,* it was at once apparent that this was a distinct species. *Blaisdelli* is a larger species, with the antennae strongly and unquestionably pectinate. The antennae in *pusillus* might be described as feebly pectinate and

are, in fact, as much so as in some specimens of *theveneti* Horn, in which they are so described. I have thought it more accurate to describe them as strongly serrate. If placed in a key, however, *pusillus* should be included in both the "serrate" and "pectinate" sections.

ATTALUS Erichson

Attalus plumbeus Champion and *A. olivaceus* Champion

These two Mexican species, each described (11) from a single female specimen, are so similar that they cannot be separated with certainty by the characters given in the descriptions. They can, however, be separated without difficulty by the character of the terminal abdominal segment in the female. The species which I identify as *plumbeus,* on account of the smaller head, has this segment unmodified as in most other species of the genus whereas in *olivaceus* the tip of this segment shows a narrow, deep emargination, much as in *A. morulus* Leconte and *A. smithi* Hopping.

One of the four female specimens of *plumbeus* before me has the posterior thoracic angles narrowly rufous; in the other three the thorax is uniformly black, as in the type. Champion states that the males of both species are unknown. I have males of the species that I take to be *olivaceus,* but hesitate to describe an allotype without being able to examine the type, said to be in the Oxford Museum.

Attalus viridivittatus Champion

According to the description of this species (11), the type of which was a unique male, the prothorax has "an elongate triangular patch on the anterior portion of the disc" and this character is given prominence in Champion's key to the Mexican and Central American species of the genus. Of four males now before me, the prothorax is marked as in the type in two cases, while in the other two it is immaculate; five females all have the prothorax immaculate, or virtually so. The description and key are also somewhat misleading in describing the elytral vittae as green; they are rather black with a greenish tint.

Attalus piceus n. sp.

Male. Oblong, parallel, very slightly widened posteriorly. Color piceous, the under surface of the first two antennal segments, a minute spot to the inner side of each antennal fovea, labrum, genae, posteriorthoracic angles, narrow elytral margins, involving the entire lateral margin, apex and posterior two-thirds of the sutural

margin of each elytron, legs, except for a piceous dorsal stripe on the first two pairs of femora and the hind femora (exclusive of the knees) and the mesosternal epimera testaceous to pale testaceous. Head short, oval, 1.1 times wider than long, moderately produced behind the eyes, which are prominent; the surface shining, very finely and rather densely punctate and pubescent, two erect black setae on each tempus. Antennae slender, passing the thorax by about three segments, very feebly serrate. Prothorax transverse, 1.4 times wider than long, the sides parallel, all the angles rounded, the posterior angles slightly impressed; surface and vestiture as on the head. Elytra minutely rugulose, faintly shining, not metallic, finely and densely punctured, the pale prostrate pubescence rather dense but so fine as to be relatively inconspicuous; a few erect black setae in the neighborhood of the humeri. The common pale sutural stripe is slightly dilated in its anterior half. Ventral surface very finely and densely punctulate, the pubescence inconspicuous. Second protarsal segments projecting in a rather broad, flattened lobe over the third, concealing about one-half of the latter, their tips black and rounded. Pygidium small, bluntly rounded at the tip.

Female. Similar to the male, except as follows. The antennae are shorter and not at all serrate. The pronotum is completely margined with yellow, the margin widest at the posterior angles. The elytra are more testaceous than piceous, the dark disc having developed two wide oblique pale stripes, three piceous areas remaining, i.e., a common scutellar and postscutellar spot, an oblique stripe extending from the humerus to near the sutural apex and an elongate spot in the posterior half adjacent to the pale lateral margin. The pygidium is shaped as in the male, but is testaceous, except at the base. The anterior tarsi and last abdominal segment are unmodified. Length, male and female, 2.0 mm.

Holotype, male and allotype, female, S. E. slope of Mt. Colima, Mexico, XII-2-48. H. B. Leech, collector, in the collection of the California Academy of Sciences.

Described from a series of five males and three females, all with the same data. Paratypes in the California Academy of Sciences and the collection of the author.

The four male paratypes do not show any variation of consequence, except that one has the prothorax narrowly margined with yellow throughout and one has both thorax and elytra colored as in the three females. The three females show some variation in the relative amounts of brown and yellow on the elytra, but the pat-

tern remains the same.

The species is neotropical, from almost exactly the same latitude as Mexico City. It runs to *albomarginatus* Champion in Champion's key (11), described from a single male from an unknown Mexican locality. This species, however, according to Champion, has the elytra violaceous and the prothorax, "a lanciform mark on the disc excepted," testaceous. The pale male in the present series, which has the elytra more testaceous than piceous, still has the prothorax piceous, with only a narrow pale margin. It also resembles our North American *lobulatus* Leconte, but the paler specimens of *lobulatus* have the dark discal area of the prothorax definitely trilobed, the sutural stripe is more widely dilated toward its anterior end and the sexes are similarly colored.

The following distributional records are supplementary to those contained in Leng's Catalogue and Supplements and in Nos. III and IV of the present series of Studies.

Collops cribosus Lec., Oregon; *C. tricolor* (Say), Louisiana; *C. sublimatus* Schffr., Virginia; *C. punctatus* Lec., Texas; *C. dux* Fall, California; Sinaloa, Mex.; *C. claricollis* Fall, Utah; *C. subtropicus* Fall, Georgia; *C. nigriceps* (Say), Colorado; *C. floridanus* Schffr., New Jersey; *C. bipunctatus* (Say), Nevada; *C. limbellus* G. & H., Kansas, Utah; *C. marginellus* Lec., Colorado; *C. vittatus* (Say), Michigan, Massachusetts; *C. histrio* Er., Texas; *C. tibialis* Schffr., Sonora, Mex.; *C. femoratus* Schffr., Sonora and Sinaloa, Mex.; *C. quadrimaculatus* (Fab.), Ohio, Michigan, Mexico; *C. balteatus* Lec., Oklahoma, Lower California. *Temnosophus impressus* Sz., Alabama. *Tanaops basalis* Brown, Arizona. *Anthocomus auritus* (Lec.), Texas, British Columbia; *A. directus* (Fall), Arizona; *A. ulkei* (Horn), Montana; Ontario; *A. nigrinus* (Lec.), Oregon; *A. franciscanus* (Fall), Oregon, British Columbia; *A. bipunctatus* Harrer, Delaware. *Attalus grisellus* Fall, San Luis Potosi, Mexico.

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Robberfly preys on stink bug: A robberfly, *Promachus albifacies* Williston, was collected upon a wheat stem shortly after it had captured and started to feed upon a Say stink bug, *Chlorochroa sayi* Stal. This observation was made in a field of fall-planted dryland wheat in upper Erda, Tooele County, Utah, on July 3, 1953. The stink bug was still kicking weakly when predator and prey were captured with an insect net.—G. F. Knowlton and Wilford J. Hanson, Logan, Utah.

Chrysomelid on Willow: Large numbers of larval and adult Chrysomelidae beetles, identified by G. B. Vogt as *Plagiomorpha arizonae* (Cr.), were feeding on and damaging foliage of black willow trees near "Zion Village" on September 9, 1953. This was at Springdale, in southern Utah near Zion National Park. A moderate infestation of aphids, together with numerous predacious ladybird beetles, *Chrysopa* adults and their larvae, plus some syrphid fly larvae, also was observed on these trees.—George F. Knowlton, Logan, Utah.