

# A GENERIC REVISION OF THE FOSSORIAL WASPS OF THE TRIBES STIZINI AND BEMBICINI, WITH NOTES AND DESCRIPTIONS OF NEW SPECIES

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## INTRODUCTION

The wasps comprising the subfamily, Bembicinae, as that subfamily is herein understood, have always been regarded by authorities on the Hymenoptera as forming two well-defined groups, the tribes *Stizini* and *Bembicini* of the present paper, but the taxonomic position assigned to the two groups within the family or superfamily (Sphecidae or Sphecoidea) by the various authorities has not been uniform. Some, as for example, Ashmead, who, in his scheme of classification, attached great importance to the number of tibial spurs on the second leg, separated these two groups widely; but others, as Cresson, Fox, Kohl, and Rohwer, have considered them closely related and as forming subdivisions of a larger group, although these authorities differ from one another as to the rank these subdivisions should be given. In accepting the subfamily referred to above I am following the classification adopted by J. H. Comstock in his work, *An Introduction to Entomology*, published in 1924.

The genus *Sphecius*, which was long included in the tribe, *Stizini*, does not belong there, as Rohwer has pointed out.<sup>1</sup> Consequently that genus is not considered in this revision.

In a preceding paper,<sup>2</sup> in which I undertook the revision of the *Bembicini* for North America north of Mexico, it was shown that within that region this tribe is represented by the following genera: *Bembix* Fabricius, *Microbembex* Patton, *Bicyrtes* Latreille (= *Bembidula* Burmeister), *Steniolia* Say, *Stictia* Illiger, and *Stictiella* Parker. Wasps included in the last two genera, *Stictia* and *Stictiella*, had up to the time of the publication of that paper been included in the genus *Monedula* as that genus was understood by Handlirsch,

<sup>1</sup> Proc. U. S. Nat. Mus., vol. 59, 1921, p. 403.

<sup>2</sup> Idem, vol. 52, 1917, pp. 1-155.

Kohl, and others. In that paper I pointed out, as Fox had done before me, that the generic name *Monedula* as applied to wasps must be dropped because of its preoccupation in another field, and that its place in Hymenoptera should be filled by the generic term *Stictia* Illiger. *Vespa signata* Linnaeus was at that time designated as the type of the genus *Stictia*.

I am fully aware of the difficulties that result from the breaking up of an old and long-established genus, such as the genus *Monedula*, into a number of new genera. But when an old genus, as is true in this case, embraces groups of species that possess characters rendering them just as distinct from one another as these groups are individually distinct from other long-recognized genera in the tribe, there is nothing left to do but to give these groups generic rank if our treatment of the tribe is to be at all consistent. That the genus *Monedula*, as understood by Handlirsch and others, was made up of such groups was pointed out in my previous paper. One of these groups is embraced in the genus *Stictia* Illiger, typified by *Vespa signata* Linnaeus, and to a second group the name *Stictiella* was given with *Monedula formosa* Cresson designated as the type. For a third group Burmeister's subgeneric term *Hemidula* was proposed with *Monedula singularis* Taschenberg as the type of this genus. Among the remaining described species not included in the three genera named above, I distinguish four additional groups represented by the following species: *Monedula vulpina* Handlirsch, *Monedula chilensis* Eschscholz, *Monedula gravida* Handlirsch, and *Monedula magnifica* Perty, each of which species is made the type of a new genus. To this list of new genera I have added another based upon a new species described in this paper under the name *Selman angustus*.

Inasmuch as I have not seen a specimen of *Monedula singularis* Taschenberg and find myself unable to determine from the available descriptions of this species just what generic characters it exhibits, it is possible that one of the new genera proposed herein may prove to be a synonym of *Hemidula* Burmeister. But from data furnished me by Dr. H. Bischoff, who at my request kindly examined a female of this species in the museum at Berlin, I learn that the mandibles are edentate, a character possessed in this tribe only by members of the genus *Microbembex*, to which genus *Monedula singularis* certainly does not belong. The uncertainty attached to the taxonomic position of this species will doubtless remain until representatives of both sexes of the species shall have been obtained.

In making this generic revision of the *Bembicini* I have studied with some care the various characters that have been regarded as of generic value in this tribe. Of these I have found the make-up of the maxillary and labial palpi of less value than that generally

assigned to this feature. My examination of these structures in the several genera was not extensive enough to warrant the drawing of broad conclusions, but it was carried far enough to show that in the genus *Bembia*, in which the typical numbers are four segments for the maxillary and two for the labial palpus, the variation in the number of segments in the palpi of some species is such as to lessen the value of these structures for generic purposes. Variation in respect to the number of segments in the palpi was also found in some species of *Steniolia* and *Microbembea*, but the number of individuals examined in each genus was too small to warrant any other statement than that variation does occur. In those genera in which the typical number of segments for the maxillary palpus is six and for the labial four, I did not find variation in the limited number of individuals examined. Since these numbers, however, are regarded as indicating primitive conditions, this lack of variation is readily explained. It was this search for variation in the mouth parts that led to the discovery that the number of segments in the palpi of *Monediula chilensis* Eschscholz is five for the maxillary and three for the labial instead of six and four as had heretofore been supposed.

Since in this tribe (*Bembicini*) the ocelli are much distorted or are reduced to cicatrices, I have found the anterior ocellus providing one of the most reliable characters on which to separate the tribe into genera. Although I have found within a genus some variation with regard to the extent to which the reduction or distortion of the anterior ocellus has been carried, I have found no variation in the form which that reduction shows or to which the reduction is tending. Another character in which I have found little or no variation within a genus is the pattern of the spatha of the male genitalia. With the exception of *Therapon* and *Trichostictia*, in which genera the spatha is almost identical in form, each of the other genera has its own peculiar form of the spatha. I have refrained from using this character in my keys for distinguishing the genera since there is no corresponding character in the female, but for all that, it is a character that must be taken into consideration. In addition to the characters cited above, I have made use of the pubescence of the eyes, the form of the dorsal border of the clypeus, and of certain differences in the venation of the wings.

In the accompanying table I have attempted to show my conception of the relationship existing among the several genera included in this revision. I have not, however, included in the table the genus *Hemidula*, for the simple reason that I have had no opportunity to study a single specimen of *Monediula singularis* Taschenberg.

The difficulty met in an attempt to show exact relationships among genera by a linear arrangement becomes apparent at once. If, as is generally conceded, the presence of unimpaired ocelli, labial palpi

of four segments and maxillary palpi of six segments, and three spines on the eighth sternite of the male indicate primitive conditions in this group, then the first three genera included in the table certainly belong together and are more closely related to one another than to any other of the genera considered. The other genera have become specialized along one or more of the three lines indicated above, and by selecting one of these three lines of specialization on which to base the main divisions we get a different grouping of the genera from that which would have been obtained had we selected either of the other two. It is my opinion that by making the variation in the form and extent of the reduction of the anterior ocellus the main point of departure the relationship existing among the several genera can best be brought out when a simple linear arrangement is employed. I have used such an arrangement in the table submitted.



Ocelli showing no evidence of reduction. Labrum not elongated dorso-ventrally. Intermediate tibia with two calcaria. Submedial cell extending beyond the junction of mediotibia and cubitella.	Propodeum concave; submedian cell distally subtending a single short vein.	Bembicinus.
	Inner eye-margins parallel; mandibles dentate; second abscissa of radiella straight.	Stizus.
	Inner eye-margins convergent at clypeus; mandibles edentate; second abscissa of radiella bent forward.	Stizoides.
	Anterior ocellus raised on a prominence above the general level of the frons.	Therapon.
	Anterior ocellus a semicircular cicatrice or showing a tendency toward reduction to that form.	Trichostictia.
		{ Nervulus post furcal. . . . . Editha.
		{ Nervulus normal. . . . . Selman.
	Anterior ocellus only a cicatrice.	Stictia.
	Maxillae of normal length.	Stictiella.
	Maxillae greatly elongated.	Stenolia.
	Anterior ocellus showing a tendency toward reduction to a vertical cicatrice, being placed in a pit.	{ Maxillary palpus 6-segmented; labial, 4-segmented. . . . . Rubrica.
		{ Maxillary palpus not 6-segmented; labial, not 4-segmented. . . . . Bembix.
	Anterior ocellus a transverse cicatrice or showing a tendency toward reduction to that form.	{ Mandibles dentate; radial cell normal. . . . .
		{ Mandibles edentate; radial cell appendiculate. . . . . Microbembex.
	Posterior surface of propodeum concave.	Bicyrtes.

With each genus of the tribe *Bembicini* I am presenting a key to the species of the genus, including in the key only such species as I have had an opportunity to study from mounted specimens. In a great many cases I have had only one specimen of a species from which to derive characters to be used in separating that species from other species of the genus included in the key. Any key so constructed must of necessity prove faulty, since color characters, on which we are so often forced to rely in separating species, often vary widely within the species, and since, in the case of some species, even structural differences are not constant. Defects arising out of these difficulties will be found most abundant in the key to the species of the genus *Bembix*, wherein I have disregarded geographical distribution on the theory that if two wasps belong to different species there should be some way of distinguishing one from the other aside from their geographical origin. I am fully aware of the imperfections in these keys, but I am submitting them as the best I could devise from the material available. I, therefore, ask of those who may attempt to make use of them a full measure of their generous sympathy, and to those who may find them intolerably bad I shall look with expectancy for a speedy publication of something better.

To the following institutions and to those connected with them having charge of their collections of Bembicine wasps I desire to acknowledge my indebtedness for the loan of material and for suggestions and assistance in the preparation of this paper: The California Academy of Sciences, Carnegie Museum in Pittsburgh, Cornell University, Massachusetts Agricultural College, Academy of Natural Sciences of Philadelphia, Zoologisches Museum der Universität, Berlin, American Museum of Natural History, Kansas University, and the United States National Museum.

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#### DESCRIPTION OF SPECIES

Hymenoptera belonging to the two tribes, *Stizini* and *Bembicini*, which seem to me to form a subfamily, Bembicinae,<sup>3</sup> may be distinguished from all other members of the order by the following

<sup>3</sup> This agrees with the arrangement proposed by Rohwer, Bull. 22, Conn. Geol. Nat. Hist. Surv. (1916), 1917, p. 691, except that it excludes the genus *Sphécus* and reduces the group from family to subfamily rank.

combination of characters: Lateral expansion of the pronotum forming on each side a well differentiated, rounded lobe (tubercle) which does not touch the tegula; posterior metatarsus not dilated; no plumose hairs present; maxillae normal, or if elongate, then the ocelli are more or less reduced or distorted; hind wing always with an anal lobe that is short and lacks an auxiliary vein; abdomen sessile, with the male having seven and the female six exposed segments and the last sternite of the female not turned dorsally around the sting; three closed cubital cells, of which the second receives both recurrent veins; basal vein removed from the stigma by two or more times the distance from the apex of the radial cell to the apex of the wing; stigma small, not wider than the costal cell; neither epinemia nor episternal suture present; labrum exerted and often rostriform; mandibles without an external notch. Although the members of this subfamily are thus definitely distinguished from other hymenopterous forms by possessing in common the characters given above, nevertheless the two tribes may be distinguished from one another by characters that are equally definite. These are set forth below.

KEY TO THE TRIBES OF BEMBICINAE

1. Ocelli normal; dorso-ventral length of the labrum always less than its greatest width; tibia of second leg provided with two apical spurs; submediellan cell extending beyond the junction of the mediella and cubitella veins...**Stizini.**  
 Ocelli distorted or completely reduced to cicatrices; dorso-ventral length of the labrum equal to or greater than its greatest width; tibia of second leg provided with only one spur; submediellan cell not extending beyond the junction of the mediella and cubitella veins.....**Bembicini.**

Tribe STIZINI

Handlirsch in his *Monographie der mit Nysson und Bembex verwandten Grabwespen*, part 6, published in 1892, considered *Bembicinus* Costa and *Stizoides* Guerin as synonyms of *Stizus* Latreille, and Fox in his *Proposed Classification of the Fossorial Hymenoptera of North America* took the same position as Handlirsch. Kohl also considered these two genera synonyms of *Stizus* Latreille. After a careful study, however, of all available material, which included representatives of all these genera, I am convinced that the characters on which *Bembicinus* and *Stizoides* were based are of generic importance and I have accordingly given both names generic rank.

Of the two tribes, the Stizini appear to be the more primitive and therefore the less specialized group. In this tribe the ocelli are normal and the labrum has what may be regarded as the normal form; that is, its greatest width exceeds its dorso-ventral length. The tibia of the mesothoracic leg is provided with two spurs and the submediellan cell extends beyond the junction of the mediella and cubitella veins.

## KEY TO THE GENERA OF STIZINI

1. Posterior surface of propodeum concave, its posterior-lateral angles prominently compressed and wedge-shaped; second cubital cell petiolate; second abscissa of the cubitella lacking.....**Bembicinus.**  
 Posterior surface of propodeum flat or convex, its posterior-lateral angles rounded; second cubital cell not petiolate (rarely subpetiolate); second abscissa of both radiella and cubitella present.....**2.**
2. Inner eye-margins approximately parallel; mandibles dentate; second abscissa of the radiella at its origin strongly bent forward toward the costal border of the wing; scutellum of the female usually with a small median depression.....**Stizus.**  
 Inner eye-margins convergent at the clypeus; mandibles edentate; second abscissa of the radiella approximately straight; scutellum of the female without a median depression.....**Stizoides.**

Genus **BEMBICINUS** Costa

Figures 3, 4

*Bembicinus* COSTA, Fauna del Regno di Napoli, vol. 4, 1859.—PATTON, Bull. U. S. Geol. Surv., vol. 5, 1879, p. 345.—CRESSON, Synopsis, 1887, Supp. vol. Trans. Amer. Ent. Soc., p. 115.

*Stizus* HANDLIRSCH (part), Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 101, 1892, p. 26.—FOX (part), Proc. Acad. Nat. Sci. Phila., 1894, p. 304.—KÖHL (part), Ann. des. K. K. Naturhist. Hofmus., vol. 11, 1896, p. 421.—DALLA TORRE (part), Cat. Hym., vol. 8, 1897, p. 519.

*Genotype*.—*Vespa tridens* Fabricius, designated by Patton, 1879.

Members of this genus can readily be distinguished from those of the other two genera of the tribe by the character of the posterior surface of the propodeum. This is distinctly concave and its lateral angles are compressed and more or less prominently wedge-shaped. In this respect members of this genus resemble those of the genus *Bicyrtes* Lepeletier, but in this latter genus the ocelli are completely reduced to cicatrices.

Head broad as thorax; eyes strongly convergent at the clypeus; width of labrum approximately double its dorso-ventral length; posterior margin of tenth flagellar segment of the male prolonged into a slightly curved, slender process; posterior surface of the propodeum concave, its posterior-lateral angles compressed and more or less wedgelike; second cubital cell usually petiolate but in some cases the first and second cubital cross veins simply join at their union with the radial or even join the radial separately; mediellan cell subtends only one short vein, which is the second abscissa of the radiella; the first abscissa of the discoidella is much shorter than the width of the submediellan cell; eighth sternite of the male ends in three spines.



Genus *STIZUS* Latreille

Figures 1, 2

*Stizus* LATREILLE, Hist. Nat., vol. 3, 1802, p. 344.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 101, 1892, p. 26.—Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 266.—KÖHL, Ann. K. K. Naturhist. Hofmus., vol. 11, 1896, p. 421.—DALLA TORRE, Cat. Hymn., vol. 8, 1897, p. 519.

*Megastizus* PATTON, Bull. U. S. Geol. Surv., vol. 5, 1879, p. 344.—CRESSON, Synopsis, 1887, Supp. vol. Trans. Amer. Ent. Soc., pp. 115 and 278.

*Genotype*.—*Bembex ruficornis* Fabricius, designated by Latreille in 1810.

In this genus the inner eye-margins are approximately parallel, whereas in the other genera of the tribe the inner eye-margins are more or less strongly convergent at the clypeus. The posterior-lateral angles of the propodeum are rounded and the mandibles are dentate.

Head narrower than thorax; frons broad; inner eye-margins approximately parallel; width of labrum greater than its dorso-ventral length; mandibles dentate; flagellar segments of the male without processes; scutellum of the female with a more or less prominent medial depression (absent on some species); posterior surface of propodeum flat, its posterior-lateral angles rounded; first cubital cell twice the length of the radial cell; points of union of the first and second cubital cross veins with the radial vein always distinctly separated; mediellan cell subtending two short veins, the anterior of which (second abscissa of the radiella) is strongly curved forward at its origin; first abscissa of the discoidella is long, very much longer than the width of the submediellan cell; eighth sternite of the male ends in three spines.

*STIZUS OCCIDENTALIS*, new species

Figure 29

*Type* (male).—Black; labrum; clypeus; mandibles except tips; lower part of frons, except pair of black spots at junction of clypeus; pair of triangular spots below anterior ocellus; scape below; broad inner orbits; broad fascia on pronotum; tubercles; narrow line leading down from tubercles; conspicuous spot anterior to tubercles; tegulae; narrow lateral line on scutum above tegula; conspicuous interrupted fasciae on tergites, smallest on tergite one; fasciae on sternites 2-6 very much narrowed and interrupted medially; legs, except basal part of coxae; *yellow*. There is but little black upon the abdomen, this color being almost wholly replaced by ferruginous of varying degrees of intensity.

The first three or four segments of the flagellum and the terminal 1 are for the most part ferruginous. The segments of the flagellum gradually increase in diameter from the first to the eleventh; the twelfth is conical, scarcely curved, and roundly pointed. The radial cell is distinctly infumated, the remainder of the wing very slightly so, particularly in the mid-region.

*Allotype* (female).—The allotype resembles very closely the type in the general pattern of the maculations but the yellow and ferruginous are much more extensively developed. With the exception of a pair of spots above the base of the antennae the entire frons up to the level of the anterior ocellus is yellow. The prothorax is yellow and ferruginous; there is a yellow fascia on the scutellum and also one on the metanotum. On the scutum there is a pair of obscure ferruginous discal stripes and on the metapleura a small yellow spot and two ferruginous spots. The dorsum of the propodeum bears an obscure ferruginous curved fascia; the antennae are lighter than those of the type, the flagellum being ferruginous below throughout its length. As in the case of the type the radial cell is infumated but elsewhere the infumation of the front wing is less pronounced than in the case of the wing of the type.

The clypeus of this species is distinctly six-sided and is twice as wide as long dorso-ventrally. The frons is wider on the allotype than on the type and the inner eye-margins on both are approximately parallel. The head (except the eyes), the thorax, the propodeum, and the first segment of the abdomen are covered with thickly set, moderately long, white pubescence, which is better developed on the allotype than on the type. The scutellum of the allotype bears an evident medial pit studded with short white pubescence.

Length 20 mm. Described from two specimens, a male from San Diego County, Calif., collected by Mr. Coquillett, and a female from Florence, Ariz.

*Type* (male).—Cat. No. 40847, U.S.N.M. Allotype in the collection of the Academy of Natural Sciences of Philadelphia.

#### Genus STIZOIDES Guerin

Figures 5, 6

*Stizoides* GUERIN, Incon. du Regne Anim., 1844, p. 438.

*Stizus* PATTON, Bull. U. S. Geol. Surv., vol. 5, 1879, p. 346.—CRESSON, Synopsis, 1887, Supp. vol. Trans. Amer. Ent. Soc., pp. 115 and 278.—HANDLIRSCH (part), Sitz Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 101, 1892, p. 26.—FOX (part), Proc. Acad. Nat. Sci. Phila., 1895, p. 266.—KOHLE (part), Ann. des K. K. Naturhist. Hofmus., vol. 11, 1896, p. 421.—DALLA TORE (part), Cat. Hym., vol. 8, 1897, p. 519.

*Genotype*.—*Larra fasciata* Fabricius (*Stizus calopteryx* Handlirsch), by present designation.

In this genus the mandibles are edentate, a character not present in either of the other genera of the tribe. The inner eye-margins are convergent at the clypeus and the posterior-lateral angles of the propodeum are rounded.

Head broad as thorax; inner eye-margins distinctly convergent at the clypeus; labrum rather strongly arched, its dorso-ventral length about equal to its width; mandibles edentate; posterior surface of propodeum flat, posterior-lateral angles rounded; radial cell shorter than the first cubital cell, which is less than one and one-half times as long as the radial; second cubital cell not petiolate, but the first and second cubital cross veins may have a common point of union with the radial; second abscissa of both radiella and cubitella present and approximately parallel; first abscissa of discoidella longer than the width of the mediellan cell; tenth flagellar segment of male with conspicuous process; eighth sternite of male ending in three spines.

#### Tribe BEMBICINI

With the exception of the genus *Bembix*, which is world wide in distribution, members of this tribe are confined to the Western Hemisphere. The ocelli are either completely reduced to cicatrices or are to a greater or less degree distorted. In some species the ocelli are still provided with more or less well-formed lenses, but whether these lenses are functional is a matter of conjecture. The labrum is well developed; its dorso-ventral length always exceeds its greatest width, and in some species its length is several times its width at the base. The tibia of the mesothoracic leg is provided with only a single spur. The submediellan cell does not extend beyond the junction of the mediella and cubitella veins.

#### KEY TO THE GENERA OF BEMBICINI

1. Maxillae unusually long, reaching the posterior coxae when at rest and incapable of being concealed behind the labrum; maxillary palpus composed of three segments; labial composed of one.....*Steniolia*.  
Maxillae when at rest concealed behind the labrum, or if elongated never reaching the posterior coxae; maxillary and labial palpi otherwise (in all genera except *Microbembex*).....2.
2. Anterior ocellus (or cicatrice) placed in a pit, the borders of which are distinctly elevated.....*Stictiella*.  
Anterior ocellus (or cicatrice) not placed in a pit.....3.
3. Posterior surface of propodeum (median segment) concave, its posterior-lateral angles prolonged, compressed, and wedgelike (in one species the posterior-lateral angles are rounded).....*Bicyrtes*.  
Posterior surface of propodeum (median segment) flat or convex; posterior-lateral angles rounded.....4.
4. Mandibles edentate.....5.  
Mandibles dentate (in some species teeth on inner margin of mandible may be vestigial).....6.



5. Anterior border of radial cell confluent with anterior border of wing; maxillary palpus composed of six segments, labial of four.....**Hemidula.**  
 Anterior border of radial cell at distal end not confluent with anterior border of wing; maxillary palpus and labial palpus otherwise.....**Microbembex.**
6. Eyes hairy .....**Trichostictia.**  
 Eyes naked .....7.
7. Maxillary palpus composed of six segments, labial composed of four.....8.  
 Maxillary palpus and labial palpus otherwise.....10.
8. Anterior ocellus reduced to a cicatrice, circular in form but less than a complete circle in extent.....**Stictia.**  
 Anterior ocellus reduced to a cicatrice, linear in form, transverse in position, arcuate in shape .....**Rubrica.**  
 Anterior ocellus not completely reduced to a cicatrice; a true lens present, though more or less distorted.....9.
9. Nervulus postfurcal by a distance equal to or greater than its own length; origin of discoidella distad of the junction of the nervella and cubitella.  
**Editha.**  
 Nervulus postfurcal by a distance less than its own length; origin of discoidella at the junction of the nervella and cubitella.....**Selman.**
10. Anterior ocellus not completely reduced to a cicatrice; maxillary palpus composed of five segments, labial composed of three.....**Therapon.**  
 Anterior ocellus completely reduced to a transverse, linear cicatrice; maxillary and labial palpi not composed of five and three segments, respectively.  
**Bembix.**

### Therapon, new genus

Figures 19, 20

*Monedula* HANDLIRSCH and AUTHORS (part).

*Genotype.*—*Stictia chilensis* Eschscholz.

The species on which the genus *Therapon* is based differs from all other species formerly included in the genus *Monedula* in that the maxillary palpus is composed of five segments and the labial of three. No other species in the entire subfamily have the palpi thus developed. In many respects *Therapon chilensis* resembles species of the genus *Trichostictia*: it has the maculations of the abdomen of the same color and the same general pattern; the pubescence of the thorax is similar; the ocelli are provided with lenses; and the spines on the middle coxae and the spatha of the genitalia of the male are also quite similar. It differs from the species of that genus, however, not only in the character of the maxillary and labial palpi, but also in the fact that the eyes of *chilensis* are not hairy and the clypeus is not produced upward between the antennae.

Head somewhat narrower than the thorax; eyes naked; vertex lower than the level of the top of the eyes; inner eye-margins slightly divergent at the clypeus; anterior ocellus with lens present, elliptical in form, transversely placed, and situated on a slight elevation; clypeus moderately arched, median apical area very little flattened,



carinate on median line at base but not markedly depressed on either side the midline at base; mandibles dentate; proboscis long, not wholly concealed when folded behind the labrum; maxillary palpus composed of five segments, labial of three; propodeum narrower than the thorax, its posterior-lateral angles narrowed and reduced; middle coxa of male provided with a relatively long, curved tooth; middle femur of male below at apical end provided with stout, flat tooth; second and sixth sternites of male plain; eighth sternite of male ends in short, stout, curved spine; seventh tergite of male unusually broad, bearing short, stout, lateral spines, the medial portion deeply and roundly emarginate; spatha of male genitalia as in Figure 77; venation of wings similar to that found in the genus *Stictia*.

THERAPON CHILENSIS (Eschscholz)

Figures 19, 20, 76-79

*Stictia chilensis* ESCHSCHOLZ, Naturw. Abh. Dorpat., vol. 1, 1823 (Entomograph. 1822), p. 150.

*Monedula d'Orbignii* BURMEISTER, Bol. Acad. Nac. Cordova, vol. 1, 1874, p. 116.

*Monedula chilensis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 132.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 497.

I have examined five males and three females of this species, of which Handlirsch in his monograph has given an excellent detailed description. The middle tibia of the male has the anterior apical border drawn out into a short spinelike process such as sometimes is found on species of *Bembix*. Three specimens from Chile, one female and two males, of which one is unusually small, have the dorsum of the thorax and propodeum, except for very small spots above the base of the wings, wholly black and the maculations on the sides of the thorax and propodeum greatly reduced or lacking. The remaining specimens, two males and two females from Argentina and one male from Chile, all have conspicuous lateral spots on the scutellum and well developed maculations on the sides of the thorax and propodeum. The pubescence on the thorax and propodeum is long, dense, and white but on the abdomen it is almost lacking. The seventh tergite of the male in this species is relatively broader than in any other species known at present. The lateral spines of this tergite are short and stout and the apex of the median part is strongly and roundly emarginate.

SPECIMENS EXAMINED

ARGENTINA: Bahia Blanca.

CHILE: Santiago (1923, Father C. Joseph); (E. C. Reed).

The species has been reported also from Peru, Patagonia, and La Plata.

## TRICHOSTICTIA, new genus

Figures 11, 12

*Monedula* HANDLIRSCH and AUTHORS (part).*Genotype*.—*Monedula vulpina* Handlirsch.

Wasps belonging to this genus have the eyes hairy. Of all the wasps formerly included in the genus *Monedula* none save those assigned to this genus possess this character. In addition to this they are also distinguished by the shape of the dorsal border of the clypeus, which on the medial line is produced upward to a point above the level of the lower border of the insertion of the antennæ (fig. 11).

Head scarcely as wide as the thorax; vertex at midline slightly below the level of the top of the eyes; eyes hairy, their inner margins straight but divergent at the clypeus; anterior ocellus with lens present, in form somewhat elliptical, transversely placed, and situated on a distinct, rounded elevation; mandibles dentate; clypeus moderately arched, carinate on midline dorsally, median ventral area slightly flattened, and dorsal margin at midline produced upward between the antennæ to a point above the level of the lower margin of their insertion; maxillary palpus composed of six segments, labial of four; propodeum narrower than the thorax, its posterior lateral angles less prominent than in allied genera; middle coxa of male with prominent, posterior, curved tooth; second and sixth sternites of male plain; eighth sternite of male ends in a single, curved spine; seventh tergite of male bears lateral spines and the apex of the median part is rounded, not emarginate; spatha of male genitalia as in Figure 70.

## KEY TO SPECIES OF TRICHOSTICTIA

1. Males (visible segments in abdomen 7; antenna composed of 13 segments) — 2.  
Females (visible segments in abdomen 6; antenna composed of 12 segments) ----- 4.
2. Scape above wholly ferruginous; discal spots on tergites 4-6 usually (not always) united on midline ----- *guttata*.  
Scape black above; discal spots on tergites 4-6 always separated on midline ----- 3.
3. Black on flagellum present to a greater or less degree on all segments; pubescence on thorax and propodeum white ----- *vulpina*.  
Black on flagellum limited to apical half; pubescence on thorax and propodeum decidedly brownish ----- *brunneri*.
4. Scape above wholly ferruginous; scutellum bearing a complete fascia ----- *guttata*.  
Scape black above; scutellum bearing only lateral spots ----- 5.
5. Black on flagellum present in greater or less degree on all segments; pubescence on dorsum of propodeum white ----- *vulpina*.  
Black on flagellum limited to apical half; pubescence on dorsum of propodeum long and decidedly brown ----- *brunneri*.

## TRICHOSTICTIA GUTTATA (Taschenberg)

Figure 70

*Monedula guttata* TASCHENBERG, Zeitschr. f. d. ges. Naturw., vol. 36, 1870, p. 23.*Monedula (Hemidula) guttata* BURMEISTER, Bol. Acad. Nac. Cordova, vol. 1, 1874, p. 120.*Monedula guttata* HANDLIRSCH, Sitz. Akad. wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 136.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 498.

I have examined four specimens of this species, two males and two females, all from Argentina, South America. Two of these, a male and a female, determined by Kohl, agree quite closely with Handlirsch's description of the species. Of the other two specimens that I have referred to this species, the male has the fascia on the scutellum interrupted at the midline and also has the discal spots on tergites 4 and 5 separated from one another as well as from the lateral spots on these same tergites. On the female the discal spots on tergite 4 are separated as on the male. On both male and female the maculations on the sternites consist of rather widely separated lateral spots and the sixth sternite of the female is wholly black.

## SPECIMENS EXAMINED

ARGENTINA: Mendoza (H. Rolle, Berlin W. Det. Kohl).

Handlirsch reports this species also from Montevideo, Uruguay.

## TRICHOSTICTIA VULPINA (Handlirsch)

Figures 11, 12, 69

*Monedula vulpina* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 138.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 501.

Of this species I examined two males and two females, all from Chile. The species resembles the preceding but is not quite so slender and the maculations on the thorax are less extensive. The maculations on the sternites are almost pure white and the pubescence on the propodeum is long, dense, and white, characters that serve to distinguish this species from the other two belonging to the genus.

## SPECIMENS EXAMINED

CHILE: Santiago (December, 1922, A. Faz); Southern part (M. J. Rivera).

Handlirsch reports this species also from Peru.

## TRICHOSTICTIA BRUNNERI, new species

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except small pair of discal spots and narrow border on baso-lateral margins; spot between antennae; scape and first two segments of flagellum below; narrow vertical stripe below anterior ocellus; broad anterior orbits deflected inward above anterior ocellus;



posterior orbits, broad below, narrow above; posterior border of pronotum extended around posterior border of tubercle; spot on side of prothorax; short lateral line above base of wings on scutum; narrow transverse, rectangular, lateral spots on scutellum; narrow interrupted fascia on posterior border of metanotum; small spot on side of propodeum; spot on metapleura; spot on mesopleura; lateral and discal spots completely separated on tergite one; discal spots separated from one another but united to lateral spots on tergites 2-5; four distinct spots on tergite 6; apical part of tergite 7; fasciae on sternites 2-5 broad laterally and almost interrupted by a deep anterior, median emargination; fascia on sternite 6 broad in the middle but narrowed laterally; femora in part; tibiae and tarsi wholly; *yellow*. The color of the maculations on the abdomen, labrum, clypeus, and scape is a very pale creamy yellow, while that on the thorax and legs is a much richer shade of yellow.

The basal half of the flagellum is ferruginous and none of the segments shows any special modifications. The apical part of the middle femur is dentate below. The median part of the seventh tergite is narrow and rounded at the apex while the lateral spines are short, rounded, and sharply pointed.

*Allotype* (female).—The allotype, with respect to the maculations, so closely resembles the type that a separate description is unnecessary. It differs from the type, however, in not having black discal spots on the clypeus; in having the black baso-lateral borders much reduced; in having the sides of the thorax and propodeum somewhat more extensively maculated; in having a pair of yellow spots on the posterior surface of the propodeum; in having the discal and lateral spots separated from one another on all the tergites except the fourth; and in having the coxae maculated. The sixth sternite has its apical portion wholly yellow.

The wings of this species are almost hyaline. The pubescence on thorax and propodeum is unusually dense, relatively long, and of a decidedly brownish color. There is some variation among the paratypes. On none of them do we find a pair of black spots on the clypeus. On one male the lateral and discal spots are separate on tergites 1-3, and on two of the females the lateral and discal spots are separate on all the tergites. The baso-lateral black border on the clypeus varies in extent but is never lacking. The extent of the maculations on the side of the thorax and propodeum varies on the different individuals.

This species is very closely related to *vulpina* (Handlirsch), from which it can be readily distinguished (1) by the maculations of the abdomen, which are practically white in *vulpina* and are creamy yellow in *brunneri*; (2) by the pubescence on the propodeum, which is decidedly white in *vulpina* and decidedly brownish in *brunneri*;



and (3) by the color of the basal half of the flagellum, which in both sexes of *vulpina* is predominantly black while in *brunneri* it is wholly or predominantly ferruginous.

Length 18–20 mm. Described from three males and five females. The males, including the type, and one of the females bear the simple label "Peru." Four of the females, including the allotype, bear the label "Arequipa, Peru, October 30, '98."

*Type*.—Male, Cat. No. 40848, U.S.N.M.

### EDITHA, new genus

Figures 25, 26

*Monedula* HANDLIERSCH and AUTHORS (part).

*Genotype*.—*Monedula magnifica* Perty.

This genus is very closely allied to the genus *Stictia*, from which it differs, however, in having the ocelli provided with well-formed lenses, in having the middle of the vertex not depressed but on a level with the top of the eye, in having the inner margins of the eyes strongly divergent at the clypeus, in having the temples broad, and in having the nervulus vein distinctly postfurcal.

Head narrower than thorax; eyes naked; ocelli provided with lenses; anterior ocellus circular in form but scarcely more than a semicircle in extent; inner eye margins strongly divergent at clypeus; vertex not depressed, middle part on a level with the top of the eyes; frons below anterior ocellus and dorsal part of clypeus distinctly carinate on median line; clypeus on either side the median carina somewhat depressed, ventral area more or less flattened; maxillary palpus composed of six segments, labial of four; nervulus joins the discoideus distinctly distad of the origin of the basal vein; middle coxa of male with short tooth; prominent groove and stout tooth on posterior, apical border of middle femur of male; seventh tergite of male with short, stout, lateral spines, and with median part short, broad, and truncate; eighth sternite of male ends in a single stout, curved spine; second and sixth sternites of male may or may not show distinct modifications or processes.

#### KEY TO SPECIES OF EDITHA

1. Males (abdomen with 7 visible segments; antenna with 13).....2.  
Females (abdomen with 6 visible segments; antenna with 12).....4.
2. Sixth sternite provided with a transverse row of spines.....3.  
Sixth sternite devoid of spines.....*magnifica*.
3. Maculations on tergites consisting of fasciae on first and second tergites.  
*adonis*.

Maculations on tergites consisting of lateral spots on tergites 1–4...*fuscipennis*.

- |   |              |
|---|--------------|
| 4. Maculations on tergites only lateral spots-----  | fuscipennis. |
| Maculations on tergites consisting of fasciae-----  | 5.           |
| 5. Fasciae limited to first and second tergites-----  | 6.           |
| Fasciae present on tergites 2-5-----  | pulcherrima. |
| 6. Large, length 35 mm. or more; ventral and dorsal areas of clypeus separated<br>by a well-defined transverse ridge----- | magnifica.   |
| Smaller, length 25 mm.; ventral and dorsal areas of clypeus ill defined;<br>transverse ridge almost lacking-----          | adonis.      |

EDITHA MAGNIFICA (Perty)

Figures 25, 26, 75

*Monedula magnifica* PERTY, Delectus Animal, Art. 144, pl. 28. fig. 3, 1834.—  
HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890,  
p. 122.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 498.

This handsome wasp, measuring from 35 to 45 mm. in length, is the largest species known among the bembicids. Its color is intense velvety black, with yellow markings on the head, broad yellow fasciae on first and second tergites, and yellow lateral spots on the second sternite. The temples in this species are very broad and yellow in color.

SPECIMENS EXAMINED

BRAZIL: Chapada (March).

EDITHA ADONIS (Handlirsch)

*Monedula adonis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol.  
99, 1890, p. 130; vol. 104, 1895, p. 969.—DALLA TORRE, Cat. Hym., vol. 8, 1897,  
p. 496.

*Monedula stridulans* STRAND, Zool. Jahrb. Abt. Syst. Geol. and Biol., p. 147.

A careful study of Strand's description of *M. stridulans* and a comparison of this description with Handlirsch's description of *M. adonis* convinces me that the two descriptions deal with one and the same species. In color this species so closely resembles *magnifica* that it appears to be only a smaller form of that species. The male of this species, however, differs from the male of *magnifica* in having the sixth sternite provided with a row of spines closely applied to the ventral surface of the sternite. The female is distinguished from the female of *magnifica* by its smaller size and by the lack of a transverse ridge separating the dorsal and ventral areas of the clypeus.

SPECIMENS EXAMINED

BRAZIL: Chapada (March).

PARAGUAY: Asuncion, Villa Morra (January 7, 1906, J. D. Anisits, Det. Strand).

Handlirsch reports this species also from Ipanema, Brazil.

## EDITHA FUSCIPENNIS (Lepeletier)

*Monedula fuscipennis* LEPELETIER, Hist. Nat. Ins. Hym., vol. 3, 1845, p. 286.—  
HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p.  
128.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 497.

I have before me two males that were received by the United States National Museum in an exchange and were determined by Kohl as males of this species.

Handlirsch, in his discussion of this species, writes that he had only females before him and that Lepeletier and Dahlbom likewise examined only females. A comparison of these two males with Handlirsch's description of the species convinces me that Kohl's determination is correct. In this species the temples and the division of the clypeus into dorsal and ventral areas are by no means so prominent as in the case of *magnifica*. The middle femur at the apical end below bears the characteristic groove and tooth. The second sternite is plain and the sixth bears a transverse row of spine similar to those on the male of *adonis*. Segments 6-12 of the flagella below are somewhat excavated or modified; 6 bears an evident spine below; 8 and 9 each bears a smaller spine; and 9, 10, and 11 each at the apical end below bears on the anterior border a number of spine-like hairs. The spine on the eighth sternite of the male is distinctly spear-shaped. The wings are heavily and uniformly infumated. Of the two specimens one is without a locality label and the other bears the label "Brasilia, Esperito Santo."

Handlirsch reports the species from Ipanema, and San Paola, Brazil.

## EDITHA PULCHERRIMA, new species

*Type* (female).—Black: labrum; clypeus, except fine line at base; base of mandibles; lower part of frons; broad anterior orbits; scape below; posterior orbits, narrowed above; large lateral spot on prothorax; broad fascia on pronotum, including the tubercles; pair of discal lines on scutum; spot on tegula; scutellum; metanotum; broad fascia on dorsum of propodeum narrowly interrupted on median line; lateral angles of propodeum broadly; small spot on metapleura; broad vertical line and small spot on mesopleura; first tergite, except a pair of longitudinal elliptical discal marks and a median anterior notch between them; broad fasciae on tergites 2-5 bisinuate on anterior margin, those on 2 and 3 each narrowed at the midline by a V-shaped notch; pair of triangular spots on sixth tergite; lateral spots on sternites 2-4; spot on anterior coxa; femora in part; tibiae, except posterior surfaces; anterior border of anterior tarsus; anterior border of middle tarsus to a less degree; apical segment of posterior tarsus in part; *yellow*.

Length about 27 mm.

The flagellum is black, with the tip of the apical segment reddish, the segments increasing in diameter outward to the tenth, thence slightly decreasing to the apex. The wings are hyaline. The pubescence is short and inconspicuous. The apical tergite bears a median carina and is closely and finely punctate, the punctures becoming coarser toward the apex, where a slight tendency to rugosity becomes evident. The sixth sternite is finely punctulate with widely separated coarser punctures scattered over the surface.

Described from a single female from Santa Isabel, Rio Negro, Uruguay, collected by J. D. Haseman.

*Type*.—Female, in the Carnegie Museum, Pittsburgh, Pa.

#### SELMAN, new genus

Figures 17, 18

*Genotype*.—*Selman angustus*, new species.

The characters that distinguish this genus from the genus *Stictia*, to which it is closely related, are the following: ocelli functional (at least not reduced to cicatrices); middle of vertex elevated instead of being depressed; body slender instead of stout and robust.

Head wide as thorax; eyes naked; ocelli provided with true lenses (not reduced to cicatrices); anterior ocellus circular in shape, but only slightly greater than a semicircle in extent; middle of vertex on a level with the top of the eyes; inner eye-margins parallel; slight but evident carina on lower part of frons and base of clypeus; middle part of the clypeus to near the base slightly flattened; maxillary palpus composed of six segments, labial of four; wings narrow and relatively short, about double the width of the thorax; venation of wings similar to that in the genus *Stictia*; body slender; male generic characters, if any, unknown.

#### SELMAN ANGUSTUS, new species

Figures 17, 18

*Type* (female).—Black: clypeus, except pair of transverse basal spots; labrum; mandibles, except tips; lower part of frons; scape; basal segments of flagellum below; broad anterior orbits shortened above; narrow posterior orbits broad below; tubercles continuous with broad spot on sides of prothorax and with broad fascia on posterior border of pronotum; lateral lines and pair of large, longitudinal, pear-shaped spots on scutum; fascia on anterior border of scutellum; narrow fascia on metanotum; arcuate fascia on propodeum extended in a pair of points on its posterior surface; posterior lateral angles and sides of propodeum; metapleura and mesopleura almost wholly; fasciae on tergites 1-5 interrupted at dorsal midline



and broader laterally than at midline; fascia on tergite 1 very broad laterally; continuous fascia on sixth tergite broad at midline and narrow laterally; continuous fasciae on sternites 2-5, broad laterally and narrow medially; legs, except line above on all femora and tibiae and spot below on all trochanters and proximal ends of all femora; *yellow*.

The flagellum, except the first and second segments, is more or less reddish below; above it is darker suffused with reddish basally. The distal end of the apical segment is distinctly reddish. The flagellum of the paratype shows but little of this reddish color except on the apical segment. The wings are hyaline, narrow, and relatively short. The pubescence is sparse and short, in fact, almost lacking. The discal marks on the scutum and the lower part of the maculation of the mesopleura show a tendency to the reddish color seen on the flagellum. The male of the species is unknown.

Length, 18 mm. Described from two specimens (including the type) from Chapada, Brazil.

*Type and paratype*.—In the Carnegie Museum in Pittsburgh, Pa.

#### Genus STICTIA Illiger

##### Figures 23, 24

*Vespa* LINNAEUS, *Systema Naturae*, ed. 10, vol. 1, 1758, p. 574 (part).

*Bembex* FABRICIUS, *Syst. Ent.*, 1775, p. 361.

*Bembex* FABRICIUS, *Mant. Ins.*, vol. 1, 1787, p. 285.—DAHLBOM, *Hym. Eur.*, vol. 1, 1845, p. 486.

*Monedula* LATREILLE, *Hist. Nat. Ins.*, vol. 3, 1802, p. 343.—DAHLBOM, *Hym. Eur.*, vol. 1, 1845, p. 492.—BURMEISTER, *Bol. Acad. Cordova*, vol. 1, 1873, p. 110.—HANDLIRSCH, *Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl.*, vol. 99, 1890, p. 77.—KÖHL, *Ann. des K. K. Naturhist. Hofmus.*, vol. 11, 1896, p. 439.—DALLA TORRE, *Cat. Hym.*, vol. 8, 1897, p. 496.

*Stictia* ILLIGER, *Fauna Etrusca* (Rossi), ed. 2, vol. 2, 1807, p. 131.—FOX, *Ent. News*, 1901, p. 269.—PARKER, *Proc. U. S. Nat. Mus.*, vol. 52, 1917, p. 15.

*Genotype*.—*Stictia signata* Linnaeus, designated by Parker in 1917.

Wasps belonging to this genus have the ocelli completely obliterated. The anterior cicatrice is circular in form but less than a complete circle in extent and is not placed in a pit or upon a distinct prominence or elevation. The middle of the vertex is depressed, is distinctly lower than the level of the top of the eyes, whose inner margins are somewhat divergent at the clypeus. The male has at the apical end of the posterior border of the middle femur a distinct notch and stout tooth. The sixth sternite of the male bears a conspicuous median area and the seventh tergite bears lateral spines and its median part is emarginate at the apex.

Head almost as wide as thorax; eyes large, their inner margins slightly divergent at clypeus and the facets near the inner border somewhat larger than those near the outer border; ocelli reduced completely to cicatrices, flat, not placed in a pit or on an elevation, circular in form but only slightly greater than a semicircle in extent; mandibles dentate; maxillary palpus composed of six segments, labial of four; clypeus but moderately arched and not distinctly divided into a dorsal and ventral area by a transverse ridge, a short carina at dorsal midline continuous with median carina of frons; median part of vertex depressed, distinctly below the level of the top of the eyes; lateral angles of propodeum somewhat prominent but rounded, not wedge shaped; seventh tergite of male with prominent lateral spines, the median part emarginate at apex; sixth sternite of male with median area slightly raised and granular in appearance; eighth sternite of male terminating in a stout curved spine; spatha of male genitalia as in Figure 72; venation of wings as in Figure 24.

## KEY TO SPECIES OF STICTIA

1. Males (abdomen with 7 visible segments, antenna composed of 13 segments) ----- 2.  
 Females (abdomen composed of 6 visible segments, antenna composed of 12 segments) ----- 16.
2. Maculations on tergites confined to lateral spots ----- 3.  
 Maculation on tergites in the form of fasciae, either more or less widely interrupted or broken into lateral and discal spots, or some broken into spots and others simply interrupted ----- 6.
3. Scutellum, metanotum, and dorsum of propodeum with broad, conspicuous fasciae; remainder of thorax and propodeum entirely black ---- trifasciata.  
 Thorax and propodeum not as above ----- 4.
4. Lateral spine on seventh tergite truncate and its apical surface concave. heros.  
 Lateral spine on seventh tergite not as above ----- 5.
5. Metanotum with narrow fascia continuous or interrupted; anterior metatarsus bearing eight spines ----- medea.  
 Metanotum black; anterior metatarsus bearing seven spines ----- antiopa.
6. Maculation of first tergite consisting of two fasciae united laterally and interrupted medially, thus forming a pair of U-shaped marks; no fasciae broken into lateral and discal spots ----- signata.  
 Maculation of first tergite otherwise: or if as above, then on one or more tergites the fascia is broken into lateral and discal spots ----- 7.
7. Fasciae on tergites not broken into lateral and discal spots. (Rarely fascia on third tergite may be broken, in which case the fasciae on the sternites are continuous) ----- 8.  
 Fasciae on some tergites or on all broken into lateral and discal spots --- 9.
8. Scutum without discal lines; fasciae on sternites 2-5 continuous -- decorata.  
 Scutum with prominent pair of discal lines; sternites 2-5 with only lateral spots ----- dives.
9. Fasciae on first and second tergites prominent; fascia on third broken into four spots; tergites 4 and 5 black or with small lateral spots; thorax and propodeum black ----- carolina.  
 Combination of maculations as given above not present ----- 10.

10. Scutum with prominent pair of discal marks.....11.  
 Scutum without discal marks.....14.
11. Side of thorax and propodeum sparingly maculated; tarsi almost wholly black.....12.  
 Side of thorax and propodeum profusely maculated; tarsi (except in some cases apical segment in part) yellow.....13.
12. Posterior apical angle of lateral spine on seventh tergite rounded; fascia on second tergite not broken into four spots.....mexicana.  
 Posterior apical angle of lateral spine on seventh tergite pointed; fascia on second tergite broken into four spots.....pantherina.
13. Lateral spine of seventh tergite almost squarely truncate, not pointed at apex; anterior metatarsus with seven spines.....sombрана.  
 Lateral spine of seventh tergite very obliquely truncate, pointed at apex; anterior metatarsus with six spines.....maculata.
14. Fasciae on scutellum and metanotum continuous or broken.....15.  
 Scutellum and metanotum not maculated (rarely small lateral spots on scutellum).....punctata.
15. Fasciae on tergites 1-4 broken into discal and lateral spots.....lineata.  
 Fasciae on tergites 2 and 4 not broken into lateral and discal spots.  
 mexicana.
16. Maculations on tergites consisting of broad continuous fasciae.....infracta.  
 Maculations on tergites not continuous fasciae.....17.
17. Maculations on tergites consisting of only widely separated lateral spots.....18.  
 Maculations on tergites consisting of fasciae, either simply interrupted or some or all broken into lateral and discal spots.....20.
18. Fasciae on metanotum and propodeum, continuous or interrupted.....medea.  
 Metanotum and propodeum without fasciae.....19.
19. Maculations on tergites creamy white; scutellum with fine and coarse punctures intermingled; wings lightly infumated.....heros.  
 Maculations on tergites yellowish; scutellum uniformly and finely punctured with some coarse punctures scattered about; wings rather heavily infumated.....antiopa.
20. Scutum without discal marks.....21.  
 Scutum with discal marks.....27.
21. All fasciae on tergites 1-4 broken into lateral and discal spots.....22.  
 Not all fasciae on tergites 1-4 broken into lateral and discal spots.....23.
22. Fasciae on scutellum and metanotum.....lineata.  
 Fasciae absent on scutellum and metanotum.....punctata.
23. Scutellum and metanotum each with fascia, continuous or interrupted.....24.  
 Scutellum with only very small, round lateral spots; metanotum immaculate.  
 carolina.
24. Fasciae on tergites 1-3 broken into lateral and discal spots; evident tooth on tenth segment of flagellum.....mexicana.  
 Not all fasciae on tergites 1-3 broken into lateral and discal spots: no tooth on flagellum.....25.
25. Tubercles maculated; broad curved fascia on dorsum of propodeum.....26.  
 Tubercles black; fascia on propodeum lacking.....carbonaria.
26. Mesopleura, metapleura, and side of propodeum without maculations.  
 arcuata.  
 Mesopleura, metapleura, and side of propodeum with prominent maculations.  
 proserpina.
27. First tergite with U-shaped lateral marks; no fascia on tergites broken into lateral and discal spots; apex of sixth tergite maculated.....signata.  
 Combination of maculations as given above not present.....28.



23. Fasciae on tergites simply interrupted (rarely broken on third tergite into lateral and discal spots)-----29.  
 Some or all of the fasciae on tergites broken into lateral and discal spots...30.
29. Sixth tergite with evident median carina extending the length of the tergite; posterior tibiae black with silvery pubescence; labrum yellow.  
 vivida.  
 Median carina on sixth tergite reduced or wanting; posterior tibiae marked with yellow; labrum with median black stripe-----dives.
30. Posterior tarsi almost wholly yellow; mesopleura wholly yellow-----31.  
 Posterior tarsi almost wholly black; mesopleura not wholly yellow, only maculated-----pantherina.
31. Scutellum lacking pubescence, very finely punctured with a few scattered larger punctures; labrum yellow; discal stripes on scutum narrow\_andrei.  
 Scutellum pubescent (at least at sides), uniformly and rather coarsely punctate; labrum with black central stripe; discal stripes on scutum broad-----maculata.

## STICTIA TRIFASCIATA, new species

## Figure 72

*Type* (male).—Black: longitudinal lateral stripes on labrum; apical line on clypeus joined to a median vertical line to base of same; pair of minute spots between antennae; narrow line on scape below; narrow anterior orbits; very narrow posterior orbits; broad fascia with short sharp prolongation at its posterior middle on scutellum; fascia on metanotum; broad curved fascia on propodeum; conspicuous, widely separated lateral spots on tergites 1–5, decreasing in size from one to five; minute lateral spots on sternite three; narrow stripe on anterior border of tibia and tarsus of first pair of legs; small spot at distal end of femora of middle and posterior legs; *yellow*. The flagellum is black and segments 6, 10, 11, and 12 bear prominent pits below, the excavation on 6 being best developed. Segments 7 to 9 bear shallow pits and are somewhat rounded out below.

This species, which in Handlirsch's key runs to *Monedula heros*, is remarkable for the presence of the three yellow bands on the thorax and propodeum. These are unusually well developed; yet, aside from these, the thorax and propodeum are entirely black. The spots on the tergites are well developed but are widely separated and the ventral surface is wholly black except for the small pair of spots on the third sternite. The wings are slightly infumated, due to the fact that the veins are bordered by a slightly infumated area, particularly evident on the anterior pair.

Length 26 mm. Described from a single male from Sapucy, Paraguay, South America.

*Type* (male).—Cat. No. 40849, U.S.N.M.



## STICTIA HEROS (Fabricius)

*Bembex heros* FABRICIUS, Syst. Piez., 1804, p. 222.

*Monedula heros* HANDLIRSCH, Sitz. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 108.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 498.

*Stictia heros* and the two species immediately following, *medea* and *antiopa*, are distinguished by having only widely separated lateral spots on the tergites and relatively few or no maculations on the thorax and propodeum. The maculations on the tergites of *heros* are a pale creamy color, almost white, whereas those on *medea* and *antiopa* are decidedly yellowish and the wings of *heros* are less heavily infumated than are those of the other two species. I have at hand 2 males and 11 females of this species, of which one female bearing the label, "Panama" has been determined by Handlirsch.

## SPECIMENS EXAMINED

ECUADOR: Posorja.

PANAMA: Ancon, Canal Zone (L. H. Dunn); Old Panama (May 15, 1909, A. H. Jennings; Jan. 31, 1911, A. Busck).

Handlirsch reports this species from Montevideo, and also from Rio Grande do Sul and Santa Catherina, Brazil.

## STICTIA MEDEA (Handlirsch)

*Monedula medea* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 109.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 498.

I have before me from Brazil four females that I have referred to this species. All bear fasciae on the metanotum; on three the curved fascia on the propodeum is continuous, on the fourth interrupted; on one the fascia on the scutellum is continuous, on a second it is narrowly interrupted, and on the other two it is reduced to lateral spots. On all four the maculations are a bright light yellow.

I have before me also a male from Surinam determined by Kohl as belonging to this species. Handlirsch did not have a male at hand when he described the species, and if Kohl has published a description of the male, I have not seen it. The maculations on the tergites of this specimen are more yellowish than in the case of the males of *heros*, but the difference is not so great as in the case of the females of the two species. The sixth segment of the flagellum and also the three apical segments are deeply excavated, much more so than is true of *heros*. Furthermore, the apical surface of the lateral spine on the seventh tergite of *heros* is distinctly excavated, whereas in the case of *medea* the lateral spine is bluntly rounded at the apex.

## SPECIMENS EXAMINED

BRAZIL: Amazonas, Rio Branco (Nov., 1903, P. Kibler S. Rolle V.); Souza, Para (Sept. 16, 1920, Cornell U. Exped.).

SURINAM.

## STICTIA ANTIOPA (Handlirsch)

*Monedula antiopa* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 109.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 496.

Handlirsch described this species from a single female and distinguished the species from *heros* because of the finer puncturing of the scutum and heavier infumation of the wings of this species, and from *medea* through the lack of yellow fasciae on the scutellum, metanotum, and propodeum. I have at hand a female, determined by Kohl, that bears the characters given by Handlirsch. I have also another female (labeled "Surinam"), which I have referred to this species and which bears a pair of lateral spots on the scutellum, a small pair on the metanotum, and small spots on the posterior lateral angles of the propodeum. The wings are more heavily infumated than those of *medea*.

Of a male that I have determined as belonging to this species, I submit the following description: Black: lateral borders of labrum; ventro-lateral borders and median vertical stripe on clypeus; scape below; vestiges of anterior and posterior orbits; very small lateral spots on scutellum; very small lateral spots on dorsum of propodeum; small spots on lateral angles of propodeum; lateral spots on tergites 1-5; lateral spots on sternites 2-4; anterior lines on anterior femora and tibiae; posterior apical spot on middle and posterior femora; *yellow*.

The wings are more heavily infumated than in the case of *heros* or *medea*. The lateral spines of the seventh tergite are more nearly perfectly truncate than are those of *medea* and are not hollowed out at the apex as are those of *heros*.

## SPECIMENS EXAMINED

SURINAM: (Fruhstorfer).

VENEZUELA: Maturin (1898—female, det. Kohl).

## STICTIA SIGNATA (Linnaeus)

## Figure 23

*Vespa signata* LINNAEUS, Syst. Nat., ed. 10, vol. 1, 1758, p. 574.

*Monedula signata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 36.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 499.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 104, 1895, p. 966.

*Stictia signata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 18.

This species is one of the most common and most widely distributed of the genus, having been reported from localities scattered throughout South America, Central America, Mexico, and the West Indies. I have examined more than one hundred specimens of this species, which may be distinguished from all other species of the genus by

the fact that the first tergite bears a pair of U-shaped maculations whose open ends are approximated and by the fact that the fasciae on the remaining tergites, though interrupted at mid line, are never broken into discal or lateral spots.

## SPECIMENS EXAMINED

- BAHAMAS: Andreas Island (J. J. Northrop).  
 BOLIVIA: Herachi Beni (September, W. M. Mann); Rurrenabaque, Beni (October, W. M. Mann).  
 BRAZIL: Ceara-Mirim (W. M. Mann); Flores (November 15, 1919, Parish); Itacoatira (November 22, 1919, Parish); Manaos (Mann, Baker); Matto Grosso; Obidos (August 10, 1919, Parish); Para (Mrs. H. B. Merrill).  
 BRITISH GUIANA (April 9, 1901, R. J. Crew).  
 COSTA RICA: San Carlos (Skiel and Burgdorf).  
 CUBA: Baracoa (August, 1901, A. Busck); Cabanas (May 18, Palmer and Riley).  
 ECUADOR (C. T. Baker).  
 FLORIDA.  
 GUATEMALA: Los Amates (February 7, 1905).  
 HONDURAS: La Ceiba (April 8, 1916, F. J. Dyer).  
 MEXICO: Cozacacoalcos (December, 1898, C. C. Deam); Rosario, Sinaloa (B. P. Clark); Santa Lucretia, Vera Cruz (F. Knab).  
 PANAMA: Alhajuelo (April 10, 1911, A. Busck); Taboga Island (February 16, 1912, A. Busck); Tabernilla (A. Busck); Old Panama (January 31, 1911, A. Busck).  
 PARAGUAY: Sapucay (April 8, 1903, W. T. Foster).  
 PERU: Lima (December 21, 1912, C. H. T. Townsend).  
 SAN SALVADOR: Cockburntown (P. Bartsch).  
 SURINAM.  
 VENEZUELA: Rio Moto, Cuara District (October 9, M. A. Carricker).

## STICTIA DECORATA (Burmeister)

*Monedula punctata* var. *decorata* TASCHENBERG, Zeitschr. f. d. ger. Nat., 1870, p. 22.

*Monedula decorata* BURMEISTER, Bol. Acad. Cordoba, vol. 1, 1874, p. 144.—HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 105.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 497.—HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 104, 1895, p. 968.

I have at hand a single male of this handsome species determined by Kohl. The clypeus and labrum are wholly yellow; the yellow on the scutum is confined to short, narrow lateral lines above the base of the wings; the fasciae on tergites 1-5 are well developed and are narrowly interrupted at midline; tergite 6 bears small lateral spots; sternites 2-5 bear broad fasciae narrowed at midline; sternite 6 bears small lateral spots. Segment 6 of the flagellum is only moderately excavated below and at the apex bears below a single short but distinct spine. The lateral spines of the seventh tergite can not be said to be truncate, but at the end they are sloping and terminate in a blunt, rounded point.

## SPECIMENS EXAMINED

ARGENTINA: Mendoza (December 14, 1906, H. Rolle Berlin W.).

Handlirsch reports this species also from Philippi, Chile.

## STICTIA DIVES (Handlirsch)

*Monedula dives* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 106.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 497.

I have before me a single male specimen that I have referred to this species. Unfortunately it bears no locality label. It has a pair of small medial black spots on the clypeus and a short median black stripe at the apex of the labrum. In other respects the coloration of this specimen fits very accurately the description of the male of the species given by Handlirsch. The excavation on the sixth segment of the flagellum is a little more prominent than in the case of *decorata*, and, as in the case of that species, this segment bears a distinct spine on the distal margin below. The lateral spines on the seventh tergite are distinctly and almost squarely truncate.

Handlirsch described the species from specimens from Mexico.

## STICTIA CAROLINA (Fabricius)

## Figure 24

*Bembex carolina* FABRICIUS, Ent. Syst., vol. 2, 1793, p. 249.

*Stictia carolina* ILLIGER, Mag. f. Ins., vol. 6, 1807, p. 195.

*Monedula carolina* LEPELETIER, Hist. Nat. Hym., vol. 3, 1845, p. 281.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 110.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 497.

With the exception of a single specimen of *Stictia signata* taken in California (D. W. Coquillett), this large and handsome species is the only one of the genus to occur within the bounds of the United States, and, so far as I am aware, it has not been found without them, although it is highly probable that it will be found in Mexico. Its large size, black thorax sparsely maculated or not at all, and the broad, bright, creamy maculations of the abdomen render this species easy of identification.

## SPECIMENS EXAMINED

ALABAMA: Booth (June 15, 1924, E. S. Holt); Montgomery (T. J. Key).

FLORIDA: Apalachicola (July, 1909, J. C. Bradley); Fernandina (W. H. Finn); Jacksonville (Ashmead); Palm (C. F. Baker).

GEORGIA: Egypt (W. H. Finn).

LOUISIANA: Houma (August 6, 1911, E. C. Wurzlów); Lee Post Office (June 29, 1896, D. W. Eavens).

MARYLAND: Chesapeake Beach (July 26, 1912, William Palmer).

OKLAHOMA: Ardmore (June 26, C. R. Jones).



TEXAS: Calmesneil (June 20, 1907, W. W. Yothers); Dallas (June 6, 1910, E. G. Blasi); Jacksonville (June 28, 1906, F. C. Bishopp); Kerrville (July 19, 1907, F. C. Pratt); Rosser (July 6, 1905, F. C. Bishopp); Victoria (May 30, 1911, J. D. Mitchell).

In addition to the localities listed above, the species has been reported from Illinois, Kansas, New Jersey, New Mexico, and Pennsylvania.

STICTIA MEXICANA (Handlirsch)

Figure 74

*Monedula mexicana* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 107.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 498.

Of the five males that I have referred to this species, four have conspicuous discal lines, and lateral lines above the base of the wings, on the scutum, but the fifth lacks the discal lines and the lateral lines are much reduced. On this same fifth specimen the fascia both on the scutellum and on the metanotum is interrupted and the fascia on the propodeum is almost obsolete while the maculations on the mesopleura and metapleura are wholly wanting and those on the lateral angles of the propodeum are reduced to small spots. On all five the fascia on the third tergite is broken into lateral and discal spots and on three of the five the fascia on the first tergite is likewise broken into lateral and discal spots.

Handlirsch described the species from two males from Mexico. A female bearing the label, "Cuernavaca, 9, '23, Moi Mex., E. G. Smyth," I regard as the female of this species. Its description is as follows: Black—lateral borders of labrum; mandibles in part; very narrow lateral spots on ventral border of clypeus; short anterior orbits; very narrow posterior orbits; posterior border of pronotum, almost obsolete; posterior border of tubercle; lateral spots on scutum above base of wings; narrow and widely interrupted fascia on scutellum; narrow, interrupted fascia on metanotum; fasciae on tergites 1-3 broken into lateral and discal spots; fasciae on tergites 4 and 5 widely interrupted; lateral spots on sternites 2-4; narrow line on anterior border of anterior tibia and tarsus and on anterior border of middle tibia; *yellow*.

The scutellum is closely and evenly punctured throughout but nowhere are the punctures of uniform size; the size and the number of coarse punctures are greater, however, in the central area than on any of the four margins. The eleventh segment of the antenna at the middle on its posterior border bears a short rounded tooth, a character that I should consider an abnormality did it not occur on both antennae. The infumation of the wings is somewhat heavier

than in the case of the male, particularly along the margins of the veins.

MEXICO: Atencingo (June 1 and 2, 1922, E. G. Smyth); Cuernavaca (September, 1923, E. G. Smyth).

**STICTIA PANTHERINA (Handlirsch)**

*Monedula punctata* var. LEPELETIER, Hist. Nat. Ins. Hym., vol. 3, 1845, p. 285.

*Monedula pantherina* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 95.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 498.

I have at hand five females that I have referred to this species, which is closely related to *maculata* and like *maculata* has the discal spots on tergites 1-4 always separate from the lateral spots. The following characters serve to distinguish this species from *maculata*: the discal lines on the scutum of this species are usually very much narrower than those on *maculata*; the maculations on the sides of the thorax and propodeum of *pantherina* are much reduced, whereas on *maculata* these parts are wholly or almost wholly yellow; the tarsi, particularly the hind tarsi on *pantherina* are almost wholly black, whereas the tarsi, particularly the hind tarsi on *maculata* are predominantly or wholly yellow.

**SPECIMENS EXAMINED**

FRENCH GUIANA: Cayenne (February, March, 1917).

VENEZUELA: Pedernales (January 25, 1911, S. Browne).

Handlirsch reports this species from Colombia and Brazil.

**STICTIA SOMERANA, new species**

*Type* (male).—Black: clypeus, except pair of broad stripes extending from base almost to apex; labrum: spot between antennae; scape below; anterior orbits shortened above; posterior orbits narrowed above; prothorax, except band extending from one tubercle to the other; pair of narrow discal lines and short line above base of wings on scutum; narrow interrupted fascia on anterior margin of scutellum; narrow fascia on metanotum: lateral lines on propodeum; posterior-lateral angles and large spot on sides of propodeum; metapleura; mesopleura; mesosternum except pair of round spots; pair of small discal and large lateral spots on tergites 1-4; large lateral spots on tergite 5; apex of seventh tergite; lateral spots on sternites 2-5, those on second sternite being very large; legs except black lines on femora and tibiae; *yellow*. The color of the labrum, clypeus and the maculations on the tergites is very light creamy yellow; that of the legs and thorax, orange yellow.

This species seems close to *Stictia mexicana* Handlirsch and, like that species, has the hind metatarsus unusually long, in this species nearly as long as the hind tibia. The apical segment on the anterior and middle tarsi (posterior missing) is marked with a black spot. The sixth segment of the flagellum is excavated on its posterior surface and is slightly spinose as is also the seventh and ninth. The tenth, eleventh, and twelfth segments are also excavated below. The lateral spines of the seventh tergite are almost squarely truncate. The wings are hyaline. The punctation of the scutellum is relatively fine and uniform; that of the scutum is similar to that of the scutellum save that very fine punctures are scattered among the coarser ones.

Length about 25 mm. Described from a single male (the type) taken by J. Chester Bradley and bearing the label, "La Sombra to El Encapto, Putumayo Dist., Peru, Aug. 23, '20."

*Type*.—In the collection of Cornell University.

#### STICTIA MACULATA (Fabricius)

*Bembex maculata* FABRICIUS, Syst. Piez., 1804, p. 222.

*Monedula maculata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 92.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 498.

This species is characterized by having broad longitudinal discal stripes on the scutum; fasciae on scutellum, metanotum and propodeum; the sides of the thorax and propodeum wholly yellow or nearly so, and on some specimens the greater part of the venter of the mesothorax also yellow; the discal spots on tergites 1-4 separated from the lateral spots; and the tarsi preponderantly or entirely yellow. On some specimens the maculations on the first tergite resemble those found on *Stictia signata* but in all cases observed the U-shaped marks were more or less broken. On some specimens one or both of the discal spots on the second tergite may be united with the corresponding lateral spot, but on no specimen studied did I find such a union on the fourth tergite—here the discal spots are always distinct. The sixth tergite of the female is invariable black and the form of the lateral spines of the seventh tergite of the male is similar to that of *signata*.

#### SPECIMENS EXAMINED

BRITISH GUIANA: Essequibo (William Schaus).

COSTA RICA: Carillo, San Carlos (Schild and Burgdorf).

MEXICO: (C. F. Baker).

PANAMA: Albajuelo (A. Busck); Cobima (May 24, 1911, A. Busck); Punta de Pensa (July 22, 1908, R. E. B. McKenney).

PERU: El Campaniento (June 28, 1920, Perene).

## STICTIA PUNCTATA (Fabricius)

*Bembyx punctata* FABRICIUS, Ent. Syst., 1775, p. 361.

*Monedula punctata* HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 97.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 499.—HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 104, 1895, p. 967.

This species once seen can scarcely be mistaken for any other of the known species of *Stictia*. The thorax and propodeum are black, sometimes wholly black, but usually with very small lateral spots on the scutellum, on the sides of the mesothorax, and on the posterior lateral angle of the propodeum. Sometimes there are traces of yellow on the prothorax. The paired discal spots on tergites 1—4 are small, widely separated from one another and widely separated from the small lateral spots on the same segments. The legs are black, with traces of yellow or ferruginous, especially on the front pair. I have at hand one male and eight females of this species.

## SPECIMENS EXAMINED

BRAZIL: Guaraja, Sao Paulo (December 2, 1916, Cornell U. Exped.); Pernambuco (December 28, 1882); Sao Paulo (Hammar).

## STICTIA LINEATA (Fabricius)

*Bembyx lineata* FABRICIUS, Ent. Syst., vol. 2, 1793, p. 250.

*Bembyx punctata* OLIVER, Enc. Meth., vol. 4, 1798, p. 290. (Misidentification).

*Monedula punctata* BURMEISTER, Bol. Acad. Cordoba, vol. 1, 1874, p. 111.

*Monedula lineata* HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 100.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 498.

This species most closely resembles *Stictia punctata*, from which it may be distinguished by the presence of fasciae on the scutellum and the metanotum and usually also on the propodeum. I have at hand one male and four females that I have referred to this species. The male has the fasciae on the scutellum and metanotum very narrow, and the fascia on the propodeum is reduced to a pair of small lateral spots. The posterior lateral angles of the propodeum bear yellow spots. There are small lateral spots on the scutum above the base of the wings, a small spot on the mesopleura below the wings, and a fascia on the pronotum that does not reach the tubercles, which are wholly black. The maculations on the abdomen are characteristic of the species. The apex of the lateral spine of the seventh tergite is obliquely truncate and its posterior angle is bluntly pointed. The male is large and robust, as is also one of the females. Two of the females are much smaller than the others and they have the scape wholly black. One of these two has the clypeus black and the yellow on the labrum reduced to small lateral spots; the other one has the



yellow on the clypeus reduced to mere traces at the extreme ventro-lateral borders and the yellow on the labrum reduced to lateral lines. The yellow on the prothorax is reduced to spots on the tubercles. The fasciae on scutellum, metanotum, and propodeum are well developed, as are the maculations on the abdomen. There are also small spots on the sides of the thorax and propodeum. The legs are predominantly black, but on three of the four females the apical segment of the tarsi is largely or wholly yellow, whereas on the fourth female and on the male this yellow is reduced to a spot or is wanting.

## SPECIMENS EXAMINED

## ARGENTINA.

BRAZIL: Chapada (March 10); Sao Paulo (Hammar); Guaraja, S. Paulo (December 2, 1919, Cornell U. Exped.).

Fabricius reports the species from Cayenne.

## STICTIA INFRACTA, new species

*Type* (female).—Black: labrum; mandibles, except tips; clypeus, except a small pair of black spots; lower part of frons extended on median line above antennae; scape below; anterior orbits; posterior orbits broad below; narrow posterior border of pronotum; tubercles and sides of prothorax almost entirely; narrow lateral lines on scutum; narrow fascia of scutellum; fascia on metanotum; narrow fascia on propodeum extending downward in a V-shaped prolongation on the posterior surface and inclosing a triangular black spot; posterior-lateral angles and sides of propodeum almost wholly; metapleura and mesopleura, except black lines at the sutures; mesosternum, except a pair of black spots in front of middle coxae; broad continuous fasciae on tergites 1-5, slightly emarginate at anterior middle and produced forward slightly on either side the emargination on all except the first, and produced forward laterally on all; pair of median spots on anterior surface of tergite 1; interrupted fascia on tergite 6 produced forward laterally as on preceding; sternites 1-3 entirely; 4, except anterior median spot; 5, except median and pair of lateral black spots; pair of small lateral spots at apex of sixth; legs entirely, except black lines above on all femora and tibiae; *yellow*. Flagellum black above, tawny below. Wings hyaline.

In form this species is relatively slender and resembles more closely members of the genus *Bembia* than it does the robust forms of *Stictia*. If it were not for the form of the anterior ocellus and the character of the mouth parts, it would readily pass for a *Bembia*. The color of the dorsal markings and the clypeus is a pale greenish or creamy yellow, while that of the labrum, the ventral markings, and

the legs is more nearly orange. The pubescence is white, very short, and sparse. The swelling at the base of the second sternite is less evident than is usual in this genus. The sixth tergite is coarsely punctate with a slight tendency to become rugose at the apex. It bears a slight but evident median carina and along the lateral borders are numerous coarse, stiff hairs. The sixth sternite is also slightly carinate on the median line and is covered with uniform shallow punctures, among which, toward the apex, are numerous coarser ones.

Length, 19 mm. Described from a single female taken at Piura, Peru, by Townsend, April 28, 1911.

*Type* (female).—Cat. No. 40850, U.S.N.M.

**STICTIA CARBONARIA (Burmeister)**

*Monedula carbonaria* BURMEISTER, Bol. Acad. Nac. Cordova, vol. 1, 1874, p. 113.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 102.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 497.

I have at hand two females of this species determined by Handlirsch. On one specimen the sides of the thorax are entirely black, except for a very narrow line on the border of the prothorax below the tubercles. On the other specimen these same lines below the tubercles are present and also a minute spot below the wings on the mesothorax. On this latter specimen there is a trace of color on the posterior border of the pronotum, but on both specimens the tubercles are black as is likewise the scutum.

SPECIMENS EXAMINED

BRAZIL: Ihering, Rio Grande (Det. Handlirsch).

Handlirsch reports this species from Parana and Montevideo, and cites Burmeister as reporting it from Corrientes and Rio Quaiquiraro.

**STICTIA ARCUATA (Burmeister)**

*Monedula punctata* var. *arcuata* TASCHENBERG, Zeitschr. f. d. g. Nat., vol. 2, 1870, p. 22.

*Monedula arcuata* BURMEISTER, Bol. Acad. Cordova, vol. 1, 1874, p. 112.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 104.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 496.

I have before me two females of this species determined by Handlirsch. The prothorax, exclusive of the broad fascia on the pronotum including the tubercles, is entirely black. The scutum, the mesopleura, the metapleura, and the side of the propodeum, exclusive of the posterior lateral angles, are also black. The scutellum on its anterior border bears a broad fascia narrowly interrupted at the midline. The metanotum is almost wholly yellow and there is a broad curved fascia on the propodeum and its posterior lateral angles

are yellow. The fascia on the third tergite is broken into lateral and discal spots.

## SPECIMENS EXAMINED

BRAZIL: Ihering, Rio Grande (Det. Handlirsch).

Handlirsch reports this species also from Montevideo and cites Burmeister as reporting it from Uruguay and from Mercedes, Argentina.

## STICTIA VIVIDA (Handlirsch)

*Monedula vivida* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 101.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 501.

I have at hand seven females from Mexico that I have referred to this species. The labrum is wholly yellow and the clypeus also, except for a large basal mark that is almost divided into two by a wide median yellow stripe. The scutum bears a pair of lateral yellow lines and a pair of long, narrow, rufous discal lines. There is a conspicuous fascia on the anterior border of the scutellum narrowed medially and partially or wholly interrupted at the median line. The metanotum is almost wholly yellow and the broad, curved fascia on the propodeum covers much of the posterior surface. There is a fascia on the posterior border of the pronotum that includes the tubercles. There are large maculations on the sides of the mesothorax and metathorax and the sides of the propodeum are almost entirely yellow. The fasciae on the tergites are unusually well developed, resembling both in size and color those of *decorata*. They are interrupted at midline, the posterior ones somewhat more widely than the anterior ones, but in no case is any fascia broken into discal and lateral spots. Three of the seven specimens have the sixth tergite with a pair of small yellow spots. This tergite is closely punctured, the punctures near the apex being coarser than those toward the base, and practically all the punctures subtend stiff spinelike hairs which are very conspicuous along the lateral borders of the tergite. This tergite bears a distinct median carina as does also the sixth sternite. The legs, which are covered with a fine silvery pubescence, are black with some reduced yellow markings. The wings are hyaline. It is a large, brightly-colored, handsome species.

## SPECIMENS EXAMINED

MEXICO: Alta Mira, Tampa (June 30, 1903).

## STICTIA PROSERPINA (Handlirsch)

*Monedula proserpina* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 99.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 499.

I have at hand a single specimen, a female from Bolivia. It agrees quite closely with Handlirsch's description of the species. The macu-



lations on the clypeus are reduced to a short median stripe and a pair of small lateral spots. The widely interrupted fasciae on the tergites are broad laterally but are very narrow medially. The third is broken into lateral and discal marks.

## SPECIMENS EXAMINED

BOLIVIA: Rio Colorado (September, M. R. Lopez).

Handlirsch described the species from specimens taken at or near Nauta, Peru.

## STICTIA ANDREI (Handlirsch)

*Monedula andrei* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 94.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 496.

I have at hand two females of this species determined by Handlirsch, of which one bears the label "E. Peru" and the other "Nauta." The characteristics of this species, as set forth by Handlirsch, are well shown by these two specimens. All the specimens, 3 males and 21 females, on which Handlirsch based his description of the species, were from Peru.

## Genus STICTIELLA Parker

Figures 13, 14, 32

*Stictiella* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 21.

*Genotype*.—*Monedula formosa* Cresson, designated by Parker in 1917.

This genus may be distinguished from all nearly related genera, except *Steniolia*, by the fact that the ocelli are placed in pits or depressions. From *Steniolia* it may readily be distinguished by the character of the maxillae, which in *Steniolia* are exceedingly long, reaching the hind coxae, and can not be folded behind the labrum when at rest, whereas in *Stictiella* the maxillae are of normal development. Available records indicate that this genus is confined to North America.

Head usually as wide as the thorax, in some species narrower; eyes naked, their inner margins approximately parallel or slightly divergent at the vertex; ocelli placed in pits or depressions, their lenses not completely obliterated, but much distorted; anterior ocellus with a distinct elevation round about it; middle of vertex not depressed below level of top of eyes; clypeus only slightly arched, no dorsal median carina present and no flattened ventral area; mandibles dentate; maxillary palpus composed of six segments, labial of four; posterior apical border of middle femur of male lacking groove and stout tooth, such as is present in the genus *Stictia*; seventh tergite of



male without lateral spines; eighth sternite of male terminating in three spines and in some species provided with an additional discal spine; venation of wings as in Figure 14; spatha of male genitalia as in Figure 32.

## KEY TO THE SPECIES OF STICTIELLA

1. Males (antenna with 13 segments; abdomen with 7 visible segments).....2.  
Females (antenna with 12 segments; abdomen with 6 visible segments).....20.
2. Middle metatarsus more or less strongly curved; inner curved surface frequently beset with spines.....3.  
Middle metatarsus not curved.....13.
3. Second sternite nontuberculate.....4.  
Second sternite unituberculate.....8.  
Second sternite bituberculate.....9.
4. Middle femora smoot beneath.....pictifrons.  
Middle femora serrate or dentate beneath.....5.
5. Pulvilli large and distinct; apical segment of all tarsi black; anterior tarsi dilated and flattened.....formosa.  
Pulvilli indistinct; tarsi normal.....6.
6. Scutum with discal marks; abdominal fasciae all continuous...melanosterna.  
Scutum without discal marks; no continuous fasciae on sternites.....7.
7. Wings hyaline; lateral spots on sternites lacking or confined to sternites 2 and 3.....plana.  
Wings distinctly infumated; lateral spots on sternites not confined to sternites 2 and 3.....serrata.
8. Apical segment of anterior tarsus broadly dilated and black; process on second sternite blunt and strongly hirsute distally.....tuberculata.  
Apical segment of anterior tarsus normal form and yellow; process on second sternite pointed and smooth distally.....callista.
9. Middle femora smooth below; head narrower than thorax.....10.  
Middle femora serrate or dentate below; head normal.....11.
10. Width of second cubital cell on radial and cubital veins about equal; second sternite almost wholly yellow.....bituberculata.  
Width of the second cubital cell on the radial vein about half its width on the cubital; second sternite mostly black.....emarginata.
11. Pulvilli indistinct; apical segment of tarsi normal.....pulchella.  
Pulvilli distinct; apical segment of tarsi black; anterior pair dilated.....12.
12. Large and stout, 18-20 mm.; fasciae on tergites broad and, except first, continuous; second inclosing pair of black discal spots; fasciae on sternites continuous or narrowly interrupted.....speciosa.  
Slender, about 15 mm., fasciae on tergites interrupted on 1 or 1-3, leaving on one or more of these tergites a pair of yellow discal spots; yellow on sternites in form of lateral spots.....spinifera.
13. Head, thorax, base of abdomen and basal joints of legs covered with long, dense, white pubescence; most specimens, but not all, have the second sternite bituberculate.....scitula.  
Pubescence of head, thorax, etc., of normal character.....14.
14. Second sternite nontuberculate.....tenuicornis.  
Second sternite unituberculate.....15.  
Second sternite bituberculate.....16.
15. Tubercle of second sternite ending in a single point.....megacera.  
Tubercle of second sternite ending in two points.....bifurcata.

16. Middle femora of normal form, not emarginate-----	17.
Middle femora more or less strongly emarginate posteriorly-----	19.
17. Scutum with a pair of discal marks-----	exigua.
Scutum without discal marks-----	18.
18. Clypeus with black more or less extensive on dorsal border-----	pulla.
Clypeus wholly pale and silvery-----	argentata.
19. Scape black above; mesosternum marked with black; genital stipes as in Figure 33-----	femorata.
Scape entirely yellow; mesosternum yellow; genital stipes as in Fig- ure 34-----	divergens.
20. Pulvilli distinct-----	21.
Pulvilli indistinct-----	25.
21. Scutum without discal markings-----	22.
Scutum with discal marks more or less well developed-----	25.
22. Head narrower than thorax; width of second cubital cell on radial vein about half its width on cubital-----	emarginata.
Head normal, wide as thorax; second cubital cell normal-----	23.
23. Anterior and middle femora entirely yellow-----	argentata.
Anterior or middle femora or both marked with black-----	24.
24. Spots on scutellum rectangular; spots on either side of anterior ocellus. Spots on scutellum triangular; V-shaped spot enclosing anterior ocellus. -----	pulla. megacera.
25. Discal marks on scutum, consisting of a pair of irregular spots, or of pair of lines not broken, not curved inward or approximated posteriorly-----	26.
Discal marks on scutum in form of a U, either broken, interrupted medially, or broken into lines and spots-----	28.
26. Scutellum with pair of large triangular lateral spots-----	pulla.
Scutellum with a continuous fascia, rarely interrupted on the medial line-----	27.
27. Fasciae on tergites yellow; that on first tergite deeply emarginate on an- terior border at midline or entirely cut through, leaving a posterior me- dian discal spot-----	pictifrons.
Fasciae on tergites pale; that on first tergite not deeply emarginate on anterior border-----	argentata.
28. Second sternite more or less black; not entirely yellow-----	29.
Second sternite entirely yellow-----	31.
29. Species small, 10-12 mm.; discal marks on scutum narrow and broken; fasciae on tergites rather narrow, wavy, scarcely to be considered emar- ginate-----	femorata.
Species larger, 16-20 mm.; discal marks on scutum two broad lines curved and approximated posteriorly; fasciae on tergites broad and emarginated anteriorly-----	30.
30. Tergites without posterior black border; posterior tarsi, save basal joint, dusky above-----	speciosa.
Tergites with a posterior black border; posterior tarsi yellow-----	formosa.
31. Species large, 15-20 mm-----	32.
Species small, 10 mm-----	34.
32. Clypeus with pair of basal black spots-----	bifurcata.
Clypeus entirely yellow-----	33.
33. Scape yellow; black spot on mesosternum near middle coxa-----	tenuicornis.

- Scape with black spot above; mesosternum yellow.....bituberculata.
34. Fascia on first tergite inclosing a medial black spot basally; head, thorax, and base of abdomen covered sparsely with long, white pubescence, most evident on the lateral angle of the propodeum.....scitula.  
Fascia on first tergite without medial black spot; pubescence not as above; face and sides of thorax more or less silvery.....exigua.
35. Scutum without discal markings.....36.  
Scutum with discal markings.....37.
36. Mesopleura immaculate; fascia on first tergite interrupted widely...serrata.  
Mesopleura with large yellow spot; fasciae on all tergites continuous.  
pulchella.
37. Discal marks on scutum small; mesopleura black, rarely with small maculations; venter of abdomen almost entirely black.....38.  
Discal marks on scutum conspicuous; mesopleura yellow; venter of abdomen almost entirely yellow.....39.
33. Wings infumated; fascia on first tergite widely interrupted and yellow.  
serrata.  
Wings hyaline; fascia on first tergite narrowly interrupted and white.  
plana.
29. Species large, 18-20 mm.; no black on mesosternum.....callista.  
Species smaller, 12-14 mm.; black spot, variable in size, in front and slightly above middle coxa.....melanosterna.

## STICTIELLA PICTIFRONS (Smith)

*Monedula pictifrons* SMITH, Cat. Hym. Brit. Mus., vol. 4, 1856, p. 335.

*Monedula incermis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 144.

*Monedula denverensis* CAMERON, Trans. Amer. Ent. Soc., vol. 34, 1908, p. 235.

*Stictiella pictifrons* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 25.

The female of this species, in color and color pattern, so closely resembles *Steniolia duplicata* Provancher that it is very frequently mistaken for that species and I have frequently found specimens so labeled. The maculations on the dorsal side of the thorax and abdomen of the male are much lighter than on the female; in fact, they are almost white. The male is characterized by having on the third and fourth segments of the anterior tarsus well developed posterior apical processes that are invariably black.

## SPECIMENS EXAMINED

COLORADO: Livermore (July 8, 1900); Boulder (September 8, 1908, S. A. Rohwer); Denver (August 24, 1908, C. Bennett).

GEORGIA: Marietta (June 7, 1909).

NEW MEXICO: Las Vegas, Hot Springs.

PENNSYLVANIA: Carlisle Junction (July 1, 1909, P. R. Myers).

TEXAS: Kerrville (June 19, 1907, F. C. Pratt).

This species has also been reported from Virginia, North Carolina, Kansas, Arizona, and California.

## STICTIELLA FORMOSA (Cresson)

Figure 32

*Monedula formosa* CRESSON, Trans. Amer. Ent. Soc., vol. 4, 1872, p. 221.*Monedula speciosa* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 140.*Stictiella formosa* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 27.

The males of this species can be readily distinguished by the character of the apical segment of the anterior tarsus. This is black, greatly dilated and flattened, its claws are greatly modified and, strange to say, the two claws are not alike. The claws on the middle and posterior tarsi are of normal form.

## SPECIMENS EXAMINED

OKLAHOMA: Bennington (August 28, 1907, F. C. Bishopp).

TEXAS: Paris (August 11, 1904, C. R. Jones); Sabinal (June 13, 1910, F. C. Pratt).

This species has also been reported from Kansas. It has also been reported from Guaymas, Sonora, Mexico, by C. L. Fox.

## STICTIELLA MELANOSTERNA Parker

*Stictiella melanosterna* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 30.

The type and allotype of this species (in United States National Museum) were taken at Las Cruces, N. Mex. It has been reported also from Arizona and Utah.

## STICTIELLA PLANA (Fox)

*Monedula plana* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 367.*Monedula usitata* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 371.*Stictiella plana* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 32.

This species is not represented in the collection of the United States National Museum. In his description of his species *usitata* Fox associated as sexes of one species male and female that in my judgment belong to different species. The evidence on which I based my conclusions was presented in my previous paper. The male of Fox's *usitata* I regard as the male of Handlirsch's *pulla* and the females of *usitata* I have associated with the male of Fox's *plana* as sexes of the same species.

## STICTIELLA SERRATA (Handlirsch)

*Monedula serrata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 99, 1890, p. 143.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 499.*Stictiella serrata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 31.

## SPECIMENS EXAMINED

FLORIDA: Biscayne Bay.

GEORGIA: Tipton (May 18, 1896).



NORTH CAROLINA: Southern Pines (June 5, 1909, A. H. Manee); White Lake, Bladen County (March, 1909, F. Sherman).

This species has also been reported from Wisconsin.

**STICTIELLA TUBERCULATA (Fox)**

*Monedula tuberculata* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 366.

*Stictiella tuberculata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 34.

Fox's type, which is in the collection of the Academy of Natural Sciences of Philadelphia, is from Nevada. A specimen of this species, which I have examined, was taken by Mr. C. L. Fox at Lewiston, Idaho.

**STICTIELLA CALLISTA Parker**

*Stictiella callista* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 34.

The type and allotype of this species (both in the United States National Museum) were taken at Mesilla Park, N. Mex., by Cockerell, the former on June 9, 1898, and the latter on July 21.

**STICTIELLA BITUBERCULATA Parker**

*Monedula tenuicornis* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 369, male (not female).

*Stictiella bituberculata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 36.

The male of this species is characterized by its narrow head, its curved middle metatarsus destitute of spines on the curved surface, the bituberculate second sternite, and the paired discal spots, almost white, on the tergites. The female resembles the female of *tenuicornis*, from which it may be distinguished by the characters set forth in the accompanying key. Furthermore, the abdomen of the female of *tenuicornis* is more slender and the tendency of the fasciae on the tergites is to inclose black discal spots, whereas on *bituberculata* the tendency of the fasciae on the tergites is to break up into lateral and discal yellow spots.

**SPECIMENS EXAMINED**

CALIFORNIA: San Bernardino County (Coquillet); Los Gastos Canyon, Mount Diablo Range (June 2, 1907, J. C. Bradley).

This species has been reported from Arizona and New Mexico.

*Type*.—In the United States National Museum.

**STICTIELLA EMARGINATA (Cresson)**

*Monedula emarginata* CRESSON, Proc. Ent. Soc. Phila., vol. 4, 1865, p. 468.

*Monedula mamillata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 146.

In this species the head is narrower than the thorax, more evident in the male than in the female, and the second cubital cell is greatly

narrowed on the radial vein. The second sternite of the male is bituberculate, the tubercles being widely separated. The specimen from Pennsylvania (male) and also the specimen from Giant Forest, Calif., have the maculations yellow instead of white, which is the color in the case of all other specimens of this species that I have seen.

## SPECIMENS EXAMINED

CALIFORNIA: Giant Forest (C. L. Fox).

COLORADO: Custer County (T. D. A. Cockerell); West Cliff.

OREGON: Mount Hood (C. L. Fox).

PENNSYLVANIA: Carlisle Junction (May 24, 1910, W. S. Fisher).

WYOMING: Snake River (August 18, 1917, W. B. Sheppard).

## STICTIELLA PULCHELLA (Cresson)

*Monedula pulchella* CRESSON, Proc. Ent. Soc. Phila., vol. 4, 1865, p. 471.

*Monedula minutula* HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 99, 1890, p. 148.—DALLA TORRE, Cat. Hym., vol. 8, 1891, p. 498.

*Stictiella pulchella* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 40.

This species was described by Cresson from two females and one male taken in Colorado. All the material at hand was taken in California as indicated below.

## SPECIMENS EXAMINED

CALIFORNIA: Los Angeles County (Coquillet); Los Gastos Canyon, Mount Diablo Range, Fresno County (June 2, 1907, J. C. Bradley).

## STICTIELLA SPECIOSA (Cresson)

*Monedula speciosa* CRESSON, Proc. Ent. Soc. Phila., vol. 4, 1865, p. 470.

?*Monedula speciosa* PATTON, Bull. U. S. Geol. Surv., vol. 5, 1879, p. 361.

*Stictiella speciosa* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 41.

There are in the collection of the United States National Museum three female specimens of this handsome species. The maculations of the thorax and abdomen are almost white. The legs are yellow with the apical tarsal segments of the middle and posterior legs decidedly dusky or black. On one specimen this is true for the apical segment of the anterior tarsi.

## SPECIMENS EXAMINED

CANADA: Medicine Hat, Assiniboia (August 20, 1916, Sladen).

COLORADO: Sterling (August 8, 1904, Johnson).

NEBRASKA: West Point (J. C. Crawford).

This species has been reported also from Kansas and New Mexico. Cresson's type (a female) in the collection of the Entomological Society of Philadelphia is from Colorado.

## STICTIELLA SPINIFERA (Mickel)

*Monedula speciosa* PATTON, Bull. U. S. Geol. Surv., vol. 5, 1879, p. 361.

*Monedula speciosa* H. S. SMITH, Univ. Neb. Studies, vol. 8, 1908, p. 383 (part).

*Monedula spinifera* MICKEL, Trans. Amer. Ent. Soc., vol. 42, 1916, p. 418.

*Stictiella melampous* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 43.

This species stands very close to *speciosa*, from which it differs in the character of the second cubital cell and in the pattern of its maculations.

## SPECIMENS EXAMINED

KANSAS: Seward County (August, 1911, F. X. Williams).

Mickel reports the species from McCook and Glen, Nebr.

## STICTIELLA SCITULA (Fox)

## Figure 14

*Monedula mamillata* Fox (not Handlirsch), Proc. Calif. Acad. Sci., div. 2, vol. 4, 1893, p. 10.

*Monedula scitula* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 369, female.

*Monedula villosa* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 370, male.

*Stictiella villosa* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 45.

*Stictiella scitula* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 46.

*Stictiella scitula* C. L. Fox, Proc. Calif. Acad. Sci., vol. 12, 1923, p. 433.

In a preceding paper I pointed out the possibility of Fox's *scitula* and *villosa* being sexes of the same species. They are found in the same locality; they have the venation of the wings the same; and both have the pubescence unusually well developed. This unusual development of the pubescence alone is strong evidence that they are sexes of one species. So far as I am aware no one has ever taken a male of *scitula* or a female of *villosa*. C. L. Fox reports that E. P. Van Duzee at Guaymas, Mexico, took three specimens of *villosa*, all males, and in the same locality 13 specimens of *scitula*, all females. I have accordingly reached the conclusion that they represent a single species, and since they were both described in the same paper, I have retained as the specific name the name of the species described first in the preparation of that paper. The female of *scitula* has the anterior metatarsus much flattened with the posterior border somewhat curved. It bears eight well-developed spines and on some specimens one or more additional spinelike hairs. Two headless females in the collection of the United States National Museum are marked "type" but by whom this was done I do not know.

## STICTIELLA TENUICORNIS (Fox)

*Monedula tenuicornis* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 368, female.

*Stictiella tenuicornis* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 47.

In his description of this species Fox associated as sexes of one species males and a female that in my judgment belong to different

species. Since the female in his description is the type of this species, I redescribed the males under the specific name of *bituberculata*, the description appearing in my previous paper on the Bembicine wasps.

## SPECIMENS EXAMINED

ARIZONA.

CALIFORNIA: San Berdina County (Coquillett).

TEXAS: Laredo (May 16, 1924); Chisolm Mountains, Brewster County (Mitchell and Cushman).

## STICTIELLA MEGACERA Parker

*Stictiella megacera* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 49.

The male of this species may be recognized by the very large hirsute process on the second sternite; by the widening of the flagellum at the third segment; and by the character of the eighth sternite with its short terminal spine, shorter lateral spines, and at the base of the terminal spine the conspicuous hump, which is not developed into a discal spine. The female shows none of these characters, but, as in the male, the legs are relatively short and stout, the middle metatarsi being unusually thick and heavy. The second cubital cell on the female is almost a perfect rectangle.

## SPECIMENS EXAMINED

COLORADO: Arboles (C. F. Baker).

MEXICO: Tepoca Bay, Sonora (C. L. Fox).

UTAH: Iron County.

WASHINGTON: North Yakima (July 17, 1903, Eldred Jenne).

## STICTIELLA TERLINGUAE C. L. Fox

*Stictiella terlinguae* C. L. Fox, Pan-Pac. Ent., vol. 4, No. 3, 1928, p. 103.

This species was described by Mr. Fox from specimens taken at Terlingua, Tex., by J. O. Martin on May 6, 1927. The description was published after my key to the species in this genus had been prepared; consequently this species is not included therein. According to the description, the male of this species runs in my key to the male of *magacera*, from which species it may be distinguished by the prominent discal spine on the eighth sternite, a character lacking in *magacera*. The female runs to the female of *tenuicornis*, which species has the fasciae on the tergites of the female unbroken, whereas on this species the fasciae on the tergites are broken into lateral and discal spots.

*Type and allotype*.—In the collection of the California Academy of Sciences.

## STICTIELLA BIFURCATA C. L. Fox

*Stictiella bifurcata* C. L. Fox, Proc. Calif. Acad. Sci., vol. 12, 1923, p. 431.

This species, like *Stictiella pictifrons*, is remarkable for its superficial resemblance to *Steniolia duplicata* Provancher, the resemblance



being even greater in this species than in *pictifrons*. The male, however, is readily distinguished by the unique character of the process on the second sternite, which is well developed, its ventral surface being unusually broad and its posterior end terminating in two points. The female may be distinguished from *pictifrons*, with which species it is most likely to be confused, by the wholly yellow second sternite, the broken U-shaped discal mark on the scutum, and especially by the presence of more or less black on the base of the clypeus.

## SPECIMENS EXAMINED

MEXICO: Angelus Bay, Gulf of California (June 26, 1921, E. P. Van Duzee); Guaymas (April 7, 1921, E. P. Van Duzee).

Fox has described a variety of this species under the name of *albicerca*, which differs from the species chiefly in having the fascia on the tergites more broken into discal and lateral spots and in having these discal spots white instead of yellow. With respect to structural characters, I have been unable to find any essential difference between the variety and the species.

## STICTIELLA EXIGUA (Fox)

*Monedula exigua* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 370.

*Stictiella exigua* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 50.

This species is not represented in the collection in the United States National Museum. It has been reported from Arizona and Montana, and by C. L. Fox from various points on the Gulf of California.

## STICTIELLA PULLA (Handlirsch)

*Monedula pulla* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 149.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 499.

*Monedula usitata* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 371.

*Stictiella pulla* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 52.

Handlirsch based his description of this species on the female. A careful study of Fox's description of his *usitata* convinced me that the male he referred to *usitata* is the male of Handlirsch's *pulla*. The considerations that led to this conviction are set forth in my previous paper.

## SPECIMENS EXAMINED

CALIFORNIA: Los Angeles County (Coquillett); San Diego County (Coquillett); San Gabriel (C. E. Hutchinson).

WASHINGTON.

## STICTIELLA ARGENTATA C. L. Fox

*Stictiella argentata* C. L. Fox, Proc. Cal. Acad. Sci., vol. 12, 1923, p. 434.

This species is closely related to *Stictiella pulla* Handlirsch, from which the male of this species may be distinguished by the absence

of any black on the clypeus. The female also lacks any black on the clypeus and further differs from *pulla* in having a fascia on the scutellum and in having the fascia on the first tergite very broad and without a median anterior emargination. On this species the clypeus, frons, and thorax, in general, are more silvery than are these same parts on *pulla*. The femora on the female of *pulla* are more or less heavily marked with black; on *argentata* the femora of the female are entirely yellow.

## SPECIMENS EXAMINED

CALIFORNIA: San Diego County (Coquillett).

MEXICO: Angeles Bay (June 25-27, 1921, E. P. Van Duzee).

## STICTIELLA FEMORATA (Fox)

## Figure 33

*Monedula femorata* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 368.

*Stictiella femorata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 53.

The male of this species may be recognized by the emarginate middle femora, the bituberculate second sternite and rudiments of similar processes on sternites 3 and 4, and by the shape of the genital stipes. The female may be known by its small size, and its non-emarginate white tergal fasciae, which unite with the fasciae on the sternites to form continuous rings around the abdomen. The second cubital cell is much narrower on the radial vein than it is on the cubital.

## SPECIMENS EXAMINED

FLORIDA: Jacksonville (Ashmead).

TEXAS: Brownsville; Cotulla (April 15, 1906, F. C. Pratt); Sabinol (May 26, 1910, F. C. Pratt); Sweet Water (June 19, 1909, F. C. Bishopp).

## STICTIELLA DIVERGENS Parker

## Figure 34

*Stictiella divergens* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 55.

Only the male of this species is known. It is closely related to *S. femorata* Fox, from which it can be distinguished by its more extensive maculations, richer yellow color, and particularly by the form of the genital stipes. It is not represented in the collection of the United States National Museum. The type is in the collection of the University of Kansas, in which State the only specimens known were taken.

Genus **STENIOLIA** Say

Figures 7, 8, 31

*Steniolia* SAY, Bost. Journ. Nat. Hist., vol. 1, 1837, p. 367.—PATTON, Bull. U. S. Geol. Surv., vol. 5, 1880, p. 364.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 504.—KOHLE, Ann. des K. K. Naturhist. Hofmus., vol. 11, 1896, p. 435.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 501.—PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 5.

*Genotype*.—*Bembex longirostris* Say (monobasic).

The extraordinary length to which the maxillae are developed, extending when at rest to the hind coxae, distinguishes members of this genus from those of all related genera. The genus seems to be confined to the mountainous regions of western North America and to extend down through Central America to northern South America, from which but a single species has been thus far reported. This was taken in Ecuador.

Head wide as thorax; eyes naked, their inner margins approximately parallel; ocelli not completely obliterated, placed in pits or depressions; anterior ocellus somewhat elliptical vertically, the sides of the pit elevated above the general surface of the frons; vertex depressed slightly below the level of the top of the eyes; clypeus somewhat arched, carina on dorsal median line continuous with carina between antennae; mandibles dentate; maxillae extremely long, reaching when at rest, the hind coxae; maxillary palpus composed of three segments, labial of one; propodeum narrower than thorax, its posterior lateral angle rounded; middle femur of male without modifications; eighth sternite ending in three spines and bearing also a more or less well-developed discal spine; venation of wings as in Figure 8; spatha of male genitalia as in Figure 31.

KEY TO THE SPECIES OF STENIOLIA

- 1. Males (abdomen with 7 visible segments, antenna with 13 segments).....2.  
    Females (abdomen with 6 visible segments, antenna with 12 segments).....12.
- 2. Middle tibia dilated.....3.  
    Middle tibia not dilated.....4.
- 3. Abdominal maculations white.....obliqua.  
    Abdominal maculations yellow.....tibialis.
- 4. Apical segment of tarsi black.....nigripes.  
    Apical segment of tarsi not black.....5.
- 5. Abdomen almost wholly yellow.....sulfurea.  
    Abdomen black and yellow, or black and white.....6.
- 6. Clypeus yellow.....7.  
    Clypeus black or with pair of black spots (or black nasal area) more or  
    less well developed.....10.
- 7. Femora, particularly the third pair of femora, black and ferruginous.  
    .....longirostris.  
    Femora not black and ferruginous.....8.

8. Maculations on tergites 1-5 broken into lateral and a pair of white discal spots ----- *elegans*.  
 Maculations on tergites 1-5 not as above ----- 9.
9. Flagellar segments 4-7 bearing small, narrow pits ----- *duplicata*.  
 Flagellar segments 4-7 not bearing pits ----- *dissimilis*.
10. Femora, particularly the third pair, black and ferruginous ----- 11.  
 Femora not black and ferruginous ----- *albicantia*.
11. Abdominal markings yellow; spine on second sternite well developed. *longirostris*.  
 Abdominal markings white; spine on second sternite lacking or weakly developed ----- *guatamalensis*.
12. Middle tibia dilated ----- 13.  
 Middle tibia not dilated ----- 14.
13. Abdominal maculations white ----- *obliqua*.  
 Abdominal maculations yellow ----- *tibialis*.
14. Femora, particularly the third pair, black and ferruginous ----- 15.  
 Femora not black and ferruginous ----- *duplicata*.\*
15. Maculations on tergites rich yellow; apical border of tergites rufous. *longirostris*.  
 Maculations on tergites white or yellowish white; apical border of tergites black ----- *guatamalensis*.

#### STENIOLIA OBLIQUA Cresson

*Steniolia obliqua* CRESSON, Proc. Ent. Soc. Phila., vol. 4, 1865, p. 469.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 511.—DALLA TORRE, Cat. Hym., vol. 8, p. 501.—PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 12.

This species is characterized by its swollen or inflated middle tibia, more evident on the male than on the female, and by its white maculations and white pubescence.

#### SPECIMENS EXAMINED

COLORADO: Boulder (September 8, 1908, S. A. Rohwer); Florissant (June 29, July 1, S. A. Rohwer); Silver Plume (July 10, 1897).

UTAH: Ogden (L. Brunner).

WYOMING: Carbon County.

This species has been found also in Oregon.

#### STENIOLIA TIBIALIS Handlirsch

*Steniolia tibialis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 513.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 501.—PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 14.

This species like *obliqua* is characterized by a swollen or inflated middle tibia, but with this species the maculations are bright yellow instead of white. In the collection of the California Academy of Sciences there is an interesting form concerning which Mr. C. L.

\* Here belongs also the female of *dissimilis*, on which I failed to find characters on which I could rely with certainty to separate it from *duplicata*.



FOX writes me as follows: "I carefully examined that interesting dark brown specimen taken by Doctor Van Dyke at Meadow Valley, Plumas County, Calif., and except for the color I can not separate it from *tibialis*. I think, as Doctor Van Duzee suggested, it is just a case of melanism. On the same date and at the same locality Doctor Van Dyke collected 20 males and 2 females, which I have determined as *tibialis*."

I have seen the specimen of which Mr. Fox here writes and I think he is right. It is a male and entirely without maculations, but aside from this fact it agrees in other respects with *tibialis*.

## SPECIMENS EXAMINED

CALIFORNIA: Meadow Valley, Plumas County (Doctor Van Dyke); Sierra Nevada.

Handlirsch reports this species from Nevada.

## STENIOLIA NIGRIPES Parker

*Steniolia nigripes* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 8.

This species is not represented in the United States National Museum. It is known only from the type, a male in the collection of the Academy of Natural Sciences, of Philadelphia, taken at Los Angeles, Calif. Its distinguishing characters are the black apical segment of all tarsi and the peculiar form of the spines of the eighth sternite.

## STENIOLIA SULFUREA Fox

*Steniolio sulfurea* FOX, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 84.—PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 9.

This species is not represented in the United States National Museum. So far as I am aware it is known only from two males (one the type) in the collection of the American Museum of Natural History, taken in California. It is distinguished by having the entire abdomen, except the basal part of the first segment, bright sulphur yellow.

## STENIOLIA LONGIROSTRIS Say

## Figure 31

*Steniolia longirostris* SAY, Bost Journ. Nat. Hist., vol. 1, 1837, p. 366.—HANDLIRSCH, Sitz, Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 508.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 501.

In his description of this species Say points out the presence of black upon both clypeus and labrum. In his description and discussion of this species Handlirsch fails to note these characters, although he had before him 20 males of the species. Say's descrip-

tion is based upon the male. It appears that he did not have a female of the species. Of the females that I have referred to this species neither clypeus nor labrum shows any trace of black marks. Of the males, at one extreme of the series the clypeus is almost entirely black and there is a broad black band across the base of the labrum; at the other extreme both clypeus and labrum are entirely free from black marks of any kind. If I had had only the two extremes of this series before me, I should have hesitated to include them in a single species, but the series shows such a gradual transition from one extreme to the other as to make it impossible to separate the series into two groups, since the variations in the series with respect to other characters bear no relation to this variation in the maculation of the clypeus and labrum. All specimens that I have referred to this species, both male and female, agree in having the hind femora ferruginous and black and the apical borders of the tergites rufous. Since the specimens referred to this species by Handlirsch also bore these characters, I am convinced of the correctness of his determination. I have at hand 14 males and 5 females.

#### SPECIMENS EXAMINED

MEXICO: Cuautla (October 30, 1922, E. G. Smyth, also November 4, 1922); "Dist. Fedrl" (J. R. Inda); Guanajuato (A. Duges); Mitla (May 2, 1904, L. O. Howard).

#### STENIOLIA ELEGANS, new species

*Type* (male).—Black: clypeus; labrum; mandibles, except apices: scape below; space between antennae; broad anterior orbits narrowed to a point above; V-shaped spot below anterior ocellus; narrow posterior orbits broad below; posterior border of pronotum; tubercles; spot on sides of prothorax; pair of lateral spots and pair of small discal spots on scutum; triangular lateral spots on scutellum; fascia on posterior border of metanotum; pair of oblique lines on dorsum of propodeum prolonged on its posterior surface; sides of propodeum almost entirely; narrow stripe broken into three spots on anterior of mesopleura; fasciae on tergites 1-5 broken into a pair of rounded discal spots and a pair of sinuate lateral spots, of which those on one and two are very broad; fascia on tergite 6 interrupted and bisinuate on either side the midline; apex of seventh; fasciae on sternites 1-6, that on second very broad, and those on second and third very narrowly interrupted at midline; legs except trochanters. coxae basally, black line above and below on femora, and black line above on middle and anterior tibiae; *yellow or white*. The dorsal markings of the abdomen are white with the extreme lateral ends of the lateral markings tinged with yellow. Elsewhere the markings are a bright lemon yellow.

The flagellum is black, lighter below, especially at the base, and is but slightly carinate on segments 6-12, due to the presence of shallow longitudinal pits. The pubescence is conspicuous, white, and longest on frons, sides of thorax, propodeum, and base of legs. The legs are of normal form and the apical segment of the tarsi of the middle and posterior legs bears a small black maculation above, limited to the posterior half of the surface. The wings are hyaline. The second sternite bears a prominent median process. The genitalia resemble those of *duplicata*.

A single male paratype differs from the type in having the markings on the sternites less extensive, in having two instead of three yellow spots on the mesopleura, and in having a black spot below on the third pair of tibiae.

Length 16 mm. Described from two males, type and paratype, from San Luis Potosi, Mexico.

*Type*.—In the collection of Massachusetts Agricultural College, Amherst, Mass.

**STENIOLIA DUPLICATA Provancher**

Figures 7, 8

*Steniolia duplicata* PROVANCHER, Add. Faun. Canada. Hym., 1888, p. 414.—PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 10.

*Steniolia scolopacca* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 510.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 501.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 104, 1895, p. 965.

*Steniolia meridionalis* C. L. FOX, Proc. Calif. Acad. Sci., vol. 12, 1923, p. 430.

This appears to be the most widely distributed and certainly, with regard to the number of individuals, the most abundant species of the genus. It presents an unusually wide variation in the development of the maculations and also considerable variation in the shade of yellow present. Although the fundamental pattern shown by the maculations remains almost constant, it is difficult to find any two specimens on which the maculations are exactly alike. I have examined the type of C. L. Fox's *meridionalis* and in my judgment it is only a color variation of this species.

SPECIMENS EXAMINED

ARIZONA: Williams (July, Barber and Schwartz).

CALIFORNIA: Coalinga, Fresno County (June 3, 1907, J. C. Bradley); Diablo Range, Fresno County (June 2, 1907, J. C. Bradley); Jacumba Springs (July 29, 1911, W. D. Pierce); Los Angeles County; Yosemite (July 20, 1905, J. McFarland).

COLORADO: Arboles (C. F. Baker); Boulder (August 25, S. A. Rohwer).

IDAHO: Lewiston (C. L. Fox).

LOWER CALIFORNIA: San Jose Del Cabo.



MEXICO: Envir de Guadalajara, Jalisco (M. Diguët).

NEVADA: Reno (August 19, 1890, F. H. Hellman).

NEW MEXICO: Alamogordo (April 29, 1902); High Rolls (May 30, 1902); Las Cruces (May 17, S. Stcel); Mesilla Park (C. N. Ainslie).

TEXAS: Marfa (June 5, 1908, Mitchell and Cushman).

UTAH: Lehi (September 9, 1905, W. A. Hooker).

WASHINGTON: North Yakima (July 7, 1903, Eldred Jenne).

WYOMING: Ritzville (July 29, 1922, M. C. Lane); Stratford (September 3, 1920).

STENIOLIA DISSIMILIS C. L. Fox

*Steniolia dissimilis* C. L. Fox, Proc. Calif. Acad. Sci., vol. 12, 1923, p. 429.

This species is very closely related to *Steniolia duplicata*. The males may be distinguished from the males of *duplicata* by the absence of pits on the segments of the flagellum. With regard to the females of this species, I have been unable to discover characters on which I could rely to separate them from the females of *duplicata*. Consequently the females of these two species are not separated from one another in the accompanying key to the species of this genus.

STENIOLIA ALBICANTIA Parker

*Steniolia albicantia* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 12.

This species was described from only male specimens and up to the time of the present writing no females have been discovered that can be associated with these males as sexes of one species. C. L. Fox, of San Francisco, has devoted considerable time to the study of the Bembicids and has collected extensively in the West. He writes me:

At Lake City, Modoc County, Calif., on the eastern side of the Warner Mountains, close to the Nevada border line, July, 1922, I collected a large series of what I determined as *albicantia*, and along with them I also took several males and females of typical *duplicata*. At Lewiston, Idaho (on the eastern border line of Washington), alongside of the Snake River, this summer (1925), I collected a series of *albicantia*, only males (similar to those from Lake City, Modoc County, Calif., in 1922) and with them in the same locality only females of *duplicata*. I did not come across a male *duplicata* during this trip.

I have never come across any white females to associate with *albicantia*, and in your description only males are described. The specimens of *albicantia* in my collection run to all sizes, robust and small.

I have seen some of the specimens collected by Mr. Fox at Lake City, Calif., and at Lewiston, Idaho, and they belong to *albicantia*. The data, however, that Mr. Fox has obtained from his work in the field and which he sets forth in his letter throw doubt on the validity of this species. I strongly suspect that the male of *duplicata* appears under two forms and that *albicantia* is simply a white form of the male of *duplicata*. More field work must be done and a fuller



knowledge of the biology of these wasps obtained before the question of the validity of species can be satisfactorily answered.

## SPECIMENS EXAMINED

CALIFORNIA: Lake City, Modoc County (July, 1922, C. L. Fox).

IDAHO: Lewiston (C. L. Fox).

WASHINGTON: Grand Coulee, Columbia River (July 12, 1902); Paha (July 25, 1923, M. C. Lane).

## STENIOLIA GUATEMALENSIS (Rohwer)

*Stictia guatemalensis* ROHWER, Proc. U. S. Nat. Mus., vol. 47, 1914, p. 517.

This species was described by Rohwer from two females from Guatemala but was referred to the wrong genus. The males that I have associated with these two females have the maculations white and have a pair of black marks, variable in size, on the clypeus. The maculations on the females are more yellowish but they are by no means so yellow as those of *longirostris*. Like that species, both males and females of this one have the hind femora black and ferruginous.

## SPECIMENS EXAMINED

ECUADOR: (C. T. Baker).

GUATEMALA: Antigua (W. P. Cockerell); Guatemala City (W. P. Cockerell).

SALVADOR: San Sebastian, Department of San Salvador (S. Calderon).

## RUBRICA, new genus

Figures 21, 22, 73

*Monedula* HANDLIRSCH and AUTHORS (part).

*Genotype*.—*Monedula gravida* Handlirsch.

Species belonging to this genus may be readily distinguished from those of other genera by the following combination of characters: Anterior ocellus a transverse, linear, arcuate cicatrice; maxillary palpus composed of six segments, labial of four; posterior lateral angles of propodeum rounded. In the case of the males the seventh tergite bears lateral spines; the eighth sternite ends in a single spine; the middle coxa bears a more or less well-developed posterior tooth, and the middle femur near its apex below bears a pair of flattened, roundly pointed teeth.

Head broad as thorax; eyes naked; anterior ocellus reduced to a cicatrice, transverse, arcuate; clypeus prominent, bulging, its basal half on median line strongly carinate, its apical portion strongly flattened; mandibles dentate; maxillary palpus composed of six segments, labial of four; posterior lateral angles of propodeum rounded.

its posterior surface somewhat concave; middle coxa of male bears a more or less well-developed posterior tooth; middle femur of male near its distal end below bears a pair of flattened, rounded teeth arising from a common base; posterior part of second sternite of male swollen and bearing a pair of rounded elevations; eighth sternite of male ends in a single spine; seventh tergite of male bears lateral spines; spatha of male genitalia as in Figure 73.

Species belonging to this genus have been reported from Mexico, North America, and from Brazil to Argentina in South America.

KEY TO THE SPECIES OF RUBRICA

1. Males (abdomen with 7 visible segments; antenna with 13 segments)-----2.  
Females (abdomen with 6 visible segments; antenna with 12 segments)-----4.
2. Anterior metatarsus bearing on its posterior border a series of rounded lobelike projections more or less black in color-----*gravida*.  
Anterior metatarsus not so formed-----3.
3. Sixth segment of the flagellum strongly excavated on its posterior side.  
*denticornis*.  
Sixth segment of flagellum not strongly excavated on its posterior side.  
*surinamensis*.
4. Sixth tergite without a well-defined carina; outline of tergite as in Figure 223-----*gravida*.  
Sixth tergite with well-defined carina; outline of sixth tergite otherwise---5.
5. Line dividing upper area of clypeus from lower area a sharply-defined, angular ridge-----*surinamensis*.  
Line dividing upper from lower area of clypeus not sharply defined, rounded-----*denticornis*.

RUBRICA GRAVIDA (Handlirsch)

Figures 21, 22, 223

*Monedula gravida* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 121.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 497.

Of the known species of this genus *gravida* is the largest and most robust. The wings are uniformly and rather heavily infumated. The male of the species has the anterior metatarsus dilated and flattened with its posterior border bearing a series of rounded lobes usually black in color. The last two segments of the flagellum of the male (eleventh and twelfth) are strongly excavated below and the apex of the tenth below is drawn out into a stout tooth. The female lacks a median carina on the sixth tergite.

SPECIMENS EXAMINED

ARGENTINA: Buenos Aires (December 31, 1921).

PARAGUAY: Sapucay (March 29, 1903, W. T. Foster).

Handlirsch reports this species also from Rio Grande do Sul, Brazil.

## RUBRICA SURINAMENSIS (Degeer)

## Figure 73

*Apis surinamensis* DEGEER, Mem. Hist. Ins., vol. 3, 1778, p. 569.

*Monedula surinamensis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 115.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 500.

I have before me 50 specimens of this species and the variation among them with regard to color is quite extensive. This variation occurs with respect to the ground color as well as to the maculations. On some specimens the ground color is predominantly black; on others it is chiefly ferruginous; while on still others it is a combination of black and ferruginous. The maculations vary in color from light creamy yellow to much darker shades of yellow and on a few specimens the fasciae on the tergites show two shades, giving the appearance of double fasciae. There is a wide variation in the maculation of the scutum, especially on the females. At one extreme the scutum is black with only narrow lateral lines of ferruginous; at the other extreme the lateral lines are broad and yellow and there is present also a pair of very broad yellow discal lines, so that the black on the scutum is almost obliterated. Specimens having the scutum thus extensively maculated have the sides and ventral surface of the body wholly yellow. If I had representatives of only these two extremes I should be inclined to consider them as representing distinct species, but the series before me shows a well-marked gradation from one extreme to the other. Furthermore, some specimens having the scutum almost black have the sides and venter as decidedly yellow as those with the scutum almost entirely yellow.

## SPECIMENS EXAMINED

ARGENTINA: Carcarana (Brunner); La Rioja (B. P. Clark).

BOLIVIA: Corinas, Rio Beni (October, 1921, W. M. Mann); Rosario, Lake Rogogua (W. M. Mann); San Georgorio, Beni (October, 1921, W. M. Mann).

BRAZIL: Benevides, Para (October, 1918, S. M. Klages); Chapada; Obidos (August 14, 1919, Parish); Pernambuco (January 17, 1883); Suore Marajo, Para.

BRITISH GUIANA: Georgetown.

COLOMBIA: Bogota; Las Flores, Santa Marta (December 25, 1922).

DUTCH GUIANA.

PARAGUAY: Sapucay (February 24, 1903, W. T. Foster).

PERU: Piura (April 23, 1911).

TRINIDAD, S. A.

VENEZUELA: Maripa, Rio Caura (October, 1909, M. A. Carricker).

## RUBRICA DENTICORNIS (Handlirsch)

*Monedula denticornis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 99, 1890, p. 119.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 497.

This species so closely resembles *surinamensis* that it is with much difficulty that the two species can be separated. The males can be

distinguished by the character of the segments of the flagellum as Handlirsch has pointed out in his description of this species. The females of *denticornis* and *surinamensis* are almost identical. Handlirsch separated them from one another by the character of the ridge or boundary that divides the dorsal area from the ventral area of the clypeus, this boundary line being distinct and angular on *surinamensis* and indistinct and rounded on *denticornis*. It is a character difficult to use and of doubtful value, but I have been unable to discover anything better.

## SPECIMENS EXAMINED

ECUADOR: Pasorja.

MEXICO: Escuinapa, Sinaloa (J. H. Batty); Alta Mira, Tampa (June 22, 1903).

PERU: Lima (E. A. Martinez—Det. Rohwer); Lima (December 27, 1912, C. H. T. Townsend); Piura (April 28, 1911).

## Genus BEMBIX Fabricius

Figures 27, 28

*Apis* LINNAEUS, Syst. Nat., ed. 10, vol. 1, 1758, p. 574.

*Bembix* FABRICIUS, Syst. Ent., Char. Gen., 1775, No. 115.—PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 75.

*Bembyx* FABRICIUS, Syst. Ent., 1775, p. 361, No. 115.

*Bembex* FABRICIUS, Gen. Insect, 1776 (or 1777), p. 122.—OLIVIER, Encycl. Meth., vol. 4, 1789, p. 288.—FABRICIUS, Ent. Syst., vol. 2, 1793, p. 247.—LATREILLE, Gén. Crust. et Ins., vol. 4, 1809, p. 97.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 663.—KOHLE, Ann. K. K. Naturhist. Hofmus., vol. 11, 1896, p. 430.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 501.

*Monedula* DAHLBOM, Hym. Eur., vol. 1, 1845, p. 492.

*Genotype*.—*Apis rostrata* Linnaeus, designated by Latreille in 1810; Morice and Durant (1915) concur in the designation.

Members of this genus are world-wide in distribution. They may be distinguished by the following combination of characters: Anterior ocellus reduced to a linear, transverse, arcuate cicatrice (traces of a lens present in a few species); posterior-lateral angles of the propodeum rounded, its posterior surface approximately flat; maxillary palpus composed of four segments, labial of two; first inter-cubitus more or less strongly bent.

Head wide as or slightly wider than the thorax; vertex depressed but slightly below the level of the top of the eyes; anterior ocellus (except in a few species) completely reduced to a linear, transverse, arcuate cicatrice; eyes naked; clypeus moderately arched, a broad, shallow median emargination on its apical border which is produced into a distinct point between the labrum and the base of the mandible; mandibles dentate; maxillary palpus composed of four segments, labial of two (on some individuals of certain species the number of segments in the palpi may vary); posterior-lateral angles



of propodeum rounded, its posterior surface approximately flat; first intercubitus usually strongly bent (in a few species nearly straight); second and sixth sternites of male with or without processes; eighth sternite of male ending in a single spine; spatha of male genitalia as in Figure 128.

KEY TO SPECIES OF *BEMBIX*

1. Males (visible segments in abdomen 7; segments in antenna 13)-----2  
Females (visible segments in abdomen 6; segments in antenna 12)----86.
2. Spines of anterior metatarsus broad, flat, and black; anterior border of middle metatarsus at apical end drawn out into a broad, thin, wedge-like process (fig. 174)-----regia.  
Spines of anterior metatarsus normal; middle metatarsus not developed as above-----3.
3. Labrum with a prominent, median, transverse notch; anterior metatarsus with eight spines; seventh tergite with distinct apical pygidial area set off by lateral ridges-----mima.  
Combination of characters as given above not present-----4.
4. Lateral border of seventh tergite with an emargination producing a sharp lateral angle or lateral spine, or with a lateral ridge that may be prolonged into a spine but is never continuous with the latero-apical margin of the tergite-----5.  
Lateral margin of seventh tergite not as above-----20.
5. Lateral ridge or carina of seventh tergite not ending in a spine or the lateral emargination not forming a distinct, sharp angle-----6.  
Lateral ridge of seventh tergite ending in a distinct spine, or the lateral emargination forming a distinct lateral angle or spine-----12.
6. Scutum densely covered with short, whitish, velvety pubescence--taiwana.  
Scutum not covered with dense, short, whitish, velvety pubescence-----7.
7. Scutum with prominent U-shaped discal mark-----fucosa.  
Scutum without discal marks-----8.
8. Middle femur bearing several spinelike teeth (fig. 126)-----loupata.  
Middle femur not bearing several spinelike teeth-----9.
9. Species 20 mm. or more in length; width of frons forming about one-third of total width of head-----10.  
Species less than 20 mm. in length; width of frons forming more than one-third the total width of head-----11.
10. Apex of process on sixth sternite not reaching apical border of the sternite; seventh sternite with a prominent median carina-----residua.  
Apex of process on sixth sternite reaching beyond the apical border of the sternite; seventh sternite with a pair of prominent lateral carinae.  
-----recurva.
11. Apical segment of tarsi marked with black; seventh tergite as in Figure 118-----levis.  
Apical segment of tarsi not marked with black; seventh tergite not as above-----opinabilis.
12. Carina or angle on lateral margin of seventh tergite produced into a distinct spine (fig. 204)-----13.  
Lateral margin of seventh tergite showing a sharp or distinct angle but not a spine (fig. 213)-----16.
13. Labrum unusually long, reaching much beyond the anterior coxae; apical part of seventh tergite rugose-----magdalena.  
Labrum normal; seventh tergite punctate-----14.

14. Middle femur dentate-----bidentata.  
Middle femur plain, or with a single tooth near the apical end bordering  
a well-defined notch-----15.
15. Middle femur plain; seventh tergite black-----tenuifasciata.  
Middle femur with tooth bordering a deep notch at apex; seventh tergite  
ferruginous-----mobii.
16. Seventh sternite conspicuously narrowed; process on sixth sternite a  
rounded, transverse swelling-----stenebdoma.  
Seventh sternite normal; process on sixth otherwise-----17.
17. Dorsum of abdomen almost wholly pale-----mediterranea.  
Dorsum of abdomen bearing only fasciæ, of which the first may be inter-  
rupted or reduced to lateral spots-----18.
18. Middle femur dentate below on apical half-----torosa.  
Middle femur plain-----19.
19. Terminal segment of antenna curved and truncate, its posterior apical  
angle pointed (fig. 162); seventh tergite black-----quinqvispinosa.  
Terminal segment of antenna not specially modified; apex of seventh  
tergite maculated-----pugillatrix.
20. Spine of eighth sternite ending in two points-----persimilis.  
Spine of eighth sternite ending in a single point-----21.
21. Anterior tibia bearing on inner side near apical end a slight depression  
between two black spots, the most distal one cup-shaped-----tenebrosa.  
Anterior tibia not bearing such characters-----22.
22. Middle metatarsus bearing a distinct lobelike dilation or swelling on its  
inner surface, usually at the middle or near the proximal end-----23.  
Middle metatarsus without such dilation or swelling-----26.
23. Basal part of wing infumated; apical part clear-----24.  
Wings clear, or uniformly infumated more or less-----25.
24. Fasciæ on tergites 1-5 yellow; sternites ferruginous-----doriae.  
Fasciæ on tergites 1-5 pale; only sternites 2 and 6 marked with fer-  
ruginous-----fuscipennis
25. Second sternite bearing a central ferruginous area; slender, less than 20  
mm. in length-----stevensoni.  
Second sternite without ferruginous area; stout, 20 mm. or more in  
length-----refuscata.
26. Middle femur serrate or dentate (in some cases only two or three teeth  
near distal end)-----27.  
Middle femur not serrate or dentate, smooth-----67.
27. Second and sixth sternites without distinct processes (in some species the  
second sternite may bear a more or less evident carina and the sixth may  
or may not bear a median blunt protuberance suggestive of a process)-----28.  
Second sternite plain or weakly carinate; sixth with small median process  
and a pair of small lateral processes near the apex of the segment.  
insularis.  
Second sternite with distinct process; sixth plain-----sinuata.  
Second and sixth sternites with processes more or less well developed-----36.
28. Middle metatarsus distinctly curved, its inner surface beset with several  
stout spines-----29.  
Middle metatarsus not so formed-----30.
29. Mesosternum marked with black; sternites 2-4 mostly black; genital stipes  
as in Figure 217-----arcuata.  
Mesosternum yellow; sternites 2-4 almost wholly yellow; genital stipes  
as in Figure 218-----U-scripta.

30. Sixth and seventh tergites black.....31.  
 Sixth, or both sixth and seventh tergites, maculated.....33.
31. Fascia on second tergite continuous.....velox.  
 Fascia on second tergite interrupted.....32.
32. Clypeus with lateral borders black; tarsi more or less heavily suffused  
 with black above.....cinerea.  
 Clypeus wholly yellow; tarsi wholly yellow.....hinei.
33. Clypeus wholly black.....alacris.  
 Clypeus yellow.....34.
34. Seventh tergite with distinct lateral lobes (fig. 153).....35.  
 Seventh tergite without lateral lobes.....aldabra.
35. Seventh tergite notched at the apex (fig. 208).....trepanda.  
 Seventh tergite roundly pointed at the apex (fig. 153).....orientalis.  
 Seventh tergite squarely truncate at the apex (fig. 191).....seculata.
36. Process on sixth sternite prominent, its ventral surface flattened, bifurcate  
 at apex.....37.  
 Process on sixth sternite a transverse ridge, not sharply pointed but  
 slightly curved on each side of midline.....belfragei.  
 Process on sixth sternite prominent, very broad and thin, rounded distally,  
 almost a semicircle. (Intermediate segments of anterior tarsus dilated,  
 flattened, and marked with black).....integra.  
 Process on sixth sternite prominent, its ventral surface flattened, bluntly  
 pointed; pair of lateral processes on same sternite.....38.  
 Process on sixth sternite not as above, either relatively small or, if  
 flattened and roundly pointed, then the lateral processes on this sternite  
 are lacking.....43.
37. Spur on the middle tibia reaching to or beyond the middle of the meta-  
 tarsus.....amoena  
 Spur on middle tibia not reaching to or beyond the middle of the meta-  
 tarsus.....sayi.
38. Thorax, propodeum, and abdomen without maculations (Japan).....fumida.  
 Thorax, propodeum, and abdomen—one or more of these maculated.....39.
39. Narrow basal border of clypeus black.....40.  
 Basal border of clypeus otherwise.....41.
40. Scutum without discal marks.....oculata.  
 Scutum with well-developed (U-shaped) discal mark.....nigrocornuta.
41. Segments 8-12 of flagellum dilated and bluntly spinose on posterior border  
 (fig. 140).....miserabilis.  
 Segments of flagellum not as above.....42.
42. Prothorax not maculated; genital stipes as in Figure 112.....hamata.  
 Prothorax maculated in greater or less degree; genital stipes otherwise.  
 nubilipennis.
43. Anterior distal border of middle tibia produced into a spinelike process.....44.  
 Anterior border of middle tibia not so developed, normal.....46.
44. Middle tibia curved; middle metatarsus flattened at the apical end.  
 merceti.  
 Middle tibia not curved; middle metatarsus round.....45.
45. Large, 20 mm.; genital stipes as in Figure 182.....regnata.  
 Smaller, 15 mm.; genital stipes as in Figure 194.....spatulata.
46. Last three segments of antenna broad, flattened, and excavated below;  
 apical segment triangular in outline (fig. 159).....47.  
 Last three segments of antenna not as above.....48.



47. Seventh sternite with a longitudinal, median carina that is bifurcate at apex; spine of eighth sternite normal.....*rostrata*.  
 Seventh sternite with simple median carina that does not reach the apex of the sternite; spine of eighth sternite short, straight, and broadly flattened.....*picticollis*.
48. Clypeus wholly or in part black, or bearing a pair of black spots.....49.  
 Clypeus yellow or pale.....52.
49. Middle metatarsus with a pair of stout spines at its middle point below; distal half below somewhat curved.....*megerlei*.  
 Middle metatarsus not as above.....50.
50. Clypeus and labrum (except lateral margins in some specimens) entirely black.....*melanopa*.  
 Clypeus at most with a pair of black spots; labrum yellow.....51.
51. Scutum without discal marks; genital stipes as in Figure 98....*forcipata*.  
 Scutum with well-developed discal marks; genital stipes as in Figure 100.....*frioensis*.
52. Seventh tergite as in Figure 148; genital stipes as in Figure 147....*ochracea*.  
 Seventh tergite and genital stipes otherwise.....53.
53. Fascia on second tergite inclosing a pair of black spots; some or all pairs of lateral spots on sternites may be connected.....54.  
 Fascia on second tergite not inclosing black spots; lateral spots on sternites not connected.....60.
54. Dorsum and posterior surface of propodeum immaculate; genital stipes as in Figure 91.....55.  
 Dorsum and posterior surface of propodeum maculated; genital stipes otherwise.....56.
55. Seventh sternite terminating with a distinct median carina; fascia on first tergite alone interrupted.....*festiva*.  
 Seventh sternite terminating with a distinct median notch; some or all fasciae on tergites (in addition to the first) interrupted....*muscicapa*.
56. Spine of eighth sternite flattened, resembling a spearhead (fig. 145).  
*niponica*.  
 Spine of eighth sternite rounded, of normal form.....57.
57. Fascia on first tergite continuous; second sternite with broad apical fascia.....58.  
 Fascia on first tergite interrupted; second sternite with only lateral spots (that may be connected with apical lines).....59.
58. Apical segment of antenna flattened and truncate at tip; scutum without discal marks.....*flavescens*.  
 Apical segment of antenna rounded at tip; scutum with evident U-shaped discal mark.....*frioensis*.
59. Fasciae on tergites, except on first, continuous.....*connexa*.  
 Fasciae on tergites all interrupted.....*frioensis*.
60. Narrow longitudinal and transverse discal lines on scutum; fascia on scutellum.....*aldabra*.  
 Above combination of maculations on scutum and scutellum not present.....61.
61. Flagellum simple, none of its segments spinose or excavated....*gradilis*.  
 Flagellum with some of its segments spinose or excavated.....62.
62. Sides of propodeum and thorax (excluding prothorax) black; rarely small spot on mesopleura.....63.  
 Sides of propodeum and thorax with conspicuous maculations....66.



63. Fasciae on tergites narrow; usually (not always) all interrupted; ultimate tergite black.....spinolae.  
Fasciae on tergites relatively broad, all but the first continuous; ultimate tergite maculated.....64.
64. Fifth segment of flagellum spinose; pubescence normal; process on sixth sternite short, broad, and roundly pointed; fasciae on tergites bright yellow.....cameroni.  
Fifth segment of flagellum not spinose; process on sixth sternite narrow and sharply pointed; fasciae on tergites white or greenish yellow.....65.
65. Fasciae on tergites white.....comata.  
Fasciae on tergites greenish yellow.....primaestate.
66. Scutellum with pair of large lateral spots.....similans.  
Scutellum without lateral spots.....primaestate.
67. Process on sixth and second sternites lacking (second may sometimes show a median carina).....68.  
Process on sixth sternite two approximated tubercles; seventh sternite a spine.....73.  
Process on sixth sternite median and apical, supplemented by a pair of curved lateral carinae; prominent lateral carinae on seventh sternite.  
liberiensis.  
Process on sixth sternite a simple median swelling, not carinate or pointed; that on second sternite small, median and pointed; thorax and propodeum entirely black and covered with long, dense, hoary pubescence.....albata.  
Process on sixth sternite a transverse ridge extending entirely across the sternite, its median part broadly curved and brought to a sharp edge; process on second sternite prominent; intermediate segments of anterior tarsus greatly dilated.....zonata.  
Process on sixth sternite variable in development, median, single, broadly triangular or narrow, pointed or notched at the apex; that on second more or less well developed, sometimes lacking.....74.
68. Clypeus marked with black.....69.  
Clypeus not marked with black.....71.
69. Seventh segment of flagellum spinose; seventh sternite tricarinate.  
formosana.  
Seventh segment of flagellum not spinose; seventh sternite with only a median carina.....70.
70. Sternites 2-4 with small lateral spots.....kreichbaumeri.  
Sternites with yellow fasciae, much narrowed at the midline.....raptor.
71. Fasciae on tergites yellow, limited to 1-4.....brullei.  
Fasciae on tergites pale, not limited to tergites 1-4.....72.
72. Seventh sternite ending in a spine.....pruinosa.  
Seventh sternite not ending in a spine.....comantis.
73. Sides of thorax and propodeum black; yellow on tergites limited to lateral spots.....beutenmulleri.  
Sides of thorax and propodeum almost entirely yellow; yellow fasciae on tergites continuous.....occidentalis.
74. One or more segments of flagellum spinose.....infumata.  
Segments of flagellum not spinose.....75.
75. Clypeus black or bearing black spots.....littoralis.  
Clypeus neither black nor bearing black spots.....76.
76. Propodeum black; fasciae on tergites limited to 1-4.....brullei.  
Propodeum maculated more or less; fasciae on tergites not limited to 1-4.....77.

77. Fasciae on all tergites interrupted.....78.  
 Fasciae on tergites, some or all, continuous.....80.
78. Sixth and seventh tergites maculated.....79.  
 Sixth and seventh tergites not maculated.....inops.
79. Scutum with broken U-shaped yellow discal mark; fasciae on tergites yellow.....frioensis.  
 Scutum, at most, bearing small white discal lines; fasciae on tergites white.....multipicta.
80. Fasciae on tergites white with a trace of yellow on anterior margin; sternites 2-5 with broad, bright yellow fasciae almost completely covering them.....flavolatera.  
 Combination of fasciae on tergites and sternites as given above not present.....81.
81. Metanotum black; fasciae on tergites creamy white.....82.  
 Metanotum maculated; fasciae on tergites yellow.....83.
82. Fasciae on tergites continuous.....agrestis.  
 Fascia on first tergite (and usually those on third and fourth) interrupted.....texana.
83. Front wing slightly infumated, most evident along the borders of the veins.....melanaspis.  
 Front wing hyaline.....84.
84. Scutum usually with pair of discal marks; dorsum of propodeum with curved yellow fascia.....troglodytes.  
 Scutum without discal marks; dorsum of propodeum black.....85.
85. Process on second sternite prominent; lateral spots on second sternite connected.....helianthopolis.  
 Process on second sternite reduced, carinate in form; lateral spots on second sternite not connected.....bahiae.
86. Antennae and frons (except spot surrounding anterior ocellus) ferruginous or yellow suffused with ferruginous; tergites 1-5 with conspicuous maculations; length 22-25 mm.....87.  
 Combination of characters as given above not present.....88.
87. Scutellum, metanotum, and propodeum each bearing a fascia.....diversipennis.  
 Scutellum, metanotum, and propodeum immaculate.....refuscata.
88. Neither metanotum nor dorsum or posterior surface of propodeum (excluding lateral angles) maculated.....89.  
 Metanotum or dorsum of propodeum or its posterior surface, any or all of these maculated.....116.
89. Fasciae on all tergites interrupted medially (in some cases reduced to lateral spots or wholly lacking).....90.  
 Some or all of the fasciae on tergites continuous.....103.
90. Ultimate tergite strongly wrinkled.....belfragei.  
 Ultimate tergite not wrinkled, punctate (or rugose, in which case the labrum is abnormally long).....91.
91. Clypeus heavily marked with black.....92.  
 Clypeus not marked with black.....96.
92. Wings clear; length 15 mm. or less.....93.  
 Wings somewhat infumated; length greater than 15 mm.....95.
93. Scape black; maculations of first and fifth tergites reduced to small widely separated lateral spots.....madecassa.  
 Scape maculated below; maculations of first and fifth tergites interrupted fasciae.....94.

94. Sternites 2-5 with lateral spots.....variabilis.  
Sternites 2-5 entirely black.....atrifrons.
95. Base of clypeus strongly carinate; apex of sixth tergite rounded.  
liberensis.  
Base of clypeus not strongly carinate; apex of sixth tergite truncate.  
infumata.
96. Wings, except apical portion, clouded; abdomen almost devoid of maculations.....tenebrosa.  
Wings clear; abdomen with evident maculations.....97.
97. Pubescence on head and thorax, especially on the sides, unusually long and hoary; middle tibial spur reaching to or beyond the middle point of the metatarsus.....98.  
Pubescence normal; middle tibial spur not reaching to middle point of the metatarsus.....99.
98. Sixth tergite maculated.....connexa.  
Sixth tergite black.....amoena.
99. Fasciae on tergites sinuate but not greatly attenuated medially; body comparatively slender.....100.  
Fasciae on tergites wide laterally, attenuated medially or reduced to lateral spots; body relatively robust.....101.
100. Fascia on second tergite imperfectly inclosing pair of discal spots; third and fourth with pair of anterior emarginations; fasciae yellow.  
muscipapa.  
Fascia on second tergite like those on third and fourth; fasciae on tergites white.....spinolae.
101. Eyes not widely separated, inner margins plainly divergent at the clypeus; lateral spots on sternites connected by apical lines.....beutenmulleri.  
Eyes widely separated, inner margins not divergent at the clypeus; lateral spots on sternites not connected by apical lines.....102.
102. Abdominal markings creamy white; tibiae heavily marked with black; length about 16 mm.....cinerea.  
Abdominal markings yellow; tibiae yellow; 18-20 mm.....hinei.
103. Basal half of wings heavily clouded.....104.  
Basal half of wings not heavily clouded.....105.
104. Scutellum with pair of lateral spots; sixth tergite black.....nubilosa.  
Scutellum black; sixth tergite maculated.....fuscipennis.
105. Clypeus with black basal border or a pair of basal black spots; usually discal spots on second tergite.....106.  
Clypeus not marked basally with black.....108.
106. Sides of thorax and propodeum conspicuously maculated; length greater than 20 mm.....luzonensis.  
Sides of thorax and propodeum black or sparingly maculated; length less than 20 mm.....107.
107. Fascia on first tergite interrupted.....texana.  
Fascia on first tergite continuous.....flavescens.
108. Sides of mesothorax or propodeum or both with evident maculations...109.  
Sides of mesothorax and propodeum black (rarely with inconspicuous maculation on mesothorax).....112
109. Large and robust, 17-20 mm.; fascia on second tergite more or less completely inclosing pair of black spots.....connexa.  
Smaller, 15 mm. or less; fascia on second tergite lacking black spots...110.



110. Scutum and scutellum wholly black.....	integra.
Scutellum and sometimes the scutum with maculations, which may be quite small.....	111.
111. Fasciae on tergites yellow.....	similans.
Fasciae on tergites white.....	primaestate.
112. Fascia on first tergite continuous.....	113.
Fascia on first tergite interrupted.....	114.
113. Fascia on second sternite inclosing pair of black spots, or bearing pair of anterior emarginations; sixth sternite black.....	brullei.
Fascia on second sternite not inclosing black spots or bearing emarginations; sixth sternite maculated.....	albata.
114. Fasciae on tergites bright yellow; ultimate tergite with central yellow maculation.....	cameroni.
Fasciae on tergites soiled or greenish white, rarely greenish yellow; sixth tergite black or with white (sometimes greenish yellow) maculation.....	115.
115. Pubescence normal; sixth tergite black.....	spinolae.
Pubescence unusually abundant; sixth tergite with white (rarely greenish yellow) maculation, sometimes much obscured.....	comata.
116. Lateral spots on sternites, at least those on sternite two, separated by a ferruginous area or band.....	117.
Lateral spots on sternites not so separated; ferruginous, if present at all, limited to apical lines.....	120.
117. Clypeus strongly carinate at base; second abscissa of the cubitella lacking.....	nupera.
Clypeus not strongly carinate at base; second abscissa of cubitella present (sometimes much reduced).....	118.
118. Fasciae on tergites yellow.....	119.
Fasciae on tergites pale.....	loupata.
119. Wings hyaline.....	capensis.
Wings infumated.....	stevensoni.
120. Labrum with median longitudinal carina whose distal part is broadened and longitudinally grooved.....	regia.
Labrum without such development.....	121.
121. Wings clouded medially or basally.....	122.
Wings not clouded medially or basally.....	125.
122. Clypeus not marked with black.....	123.
Clypeus black or marked with black.....	124.
123. Antennae ferruginous; legs marked with ferruginous.....	gracilens.
Antennae black and yellow; legs black and yellow.....	nubilpennis.
124. Maculation on mesopleura large and conspicuous; lateral spots on second sternite (sometimes on all sternites) united by apical line.....	melanaspis.
Maculation on mesopleura small or lacking; lateral spots on second sternite not connected.....	oculata.
125. Scutum with no trace of discal marks.....	126.
Scutum with more or less well-developed discal marks.....	143.
126. Large, 17-22 mm. in length.....	127.
Small, 16 mm. or less in length.....	134.
127. Fasciae on tergites yellow; second inclosing black spots.....	123.
Fasciae on tergites white or pale yellow; second never inclosing pair of black spots.....	129.
128. Clypeus yellow.....	occidentalis.
Clypeus almost entirely black.....	recurva.



129. Sixth tergite maculated.....	131.
Sixth tergite black.....	130.
130. Anterior metatarsus bearing seven spines; fifth tergite with broad continuous fascia.....	<i>pruinosa</i> .
Anterior metatarsus bearing five spines; fifth tergite with widely separated lateral spots.....	<i>quinquispinosa</i> .
131. Sixth tergite bearing spinelike hairs, most numerous laterally (spinelike hairs on the apical border of fifth tergite also).....	<i>sinuata</i> .
Sixth tergite (and fifth) devoid of spinelike hairs.....	132.
132. Scutellum bearing lateral spots.....	<i>rostrata</i> .
Scutellum bearing a fascia.....	133.
133. Fasciae on all tergites continuous.....	<i>miserabilis</i> .
Fasciae on tergites 1-3 interrupted medially.....	<i>liventis</i> .
134. Clypeus not marked with black.....	140.
Clypeus black or marked with black.....	135.
135. Labrum yellow or pale.....	136.
Labrum black or marked with black.....	138.
136. Sixth tergite maculated at apex.....	<i>megerlei</i> .
Sixth tergite black.....	137.
137. Posterior metatarsus marked with black.....	<i>formosana</i> .
Posterior metatarsus entirely yellow.....	<i>oculata</i> .
138. Mesopleura and metapleura well maculated.....	<i>helianthopolis</i> .
Mesopleura and metapleura black (rarely small spot on mesopleura).....	139.
139. Fascia on the fifth tergite continuous.....	<i>velox</i> .
Fasciae on the fifth tergite interrupted.....	<i>melanopa</i> .
140. Fascia on first tergite continuous; fasciae on tergites pale.....	<i>merceti</i> .
Fascia on first tergite interrupted (sometimes continuous, in which case fasciae on tergites are yellow).....	141.
141. Fasciae on tergites yellow.....	<i>similans</i> .
Fasciae on tergites pale.....	142.
142. Interrupted fascia on dorsum of propodeum.....	<i>inops</i> .
No fascia on dorsum of propodeum.....	<i>primaestate</i> .
143. Deep median transverse notch on front of labrum (fig. 135).....	<i>mima</i> .
Transverse notch lacking, at most a median prominence on labrum.....	144.
144. First intercubitus vein but slightly bent (fig. 220).....	145.
First intercubitus vein normal.....	149.
145. Anterior ocellus normal; that is, reduced to a cicatrice.....	146.
Anterior ocellus not completely reduced to a cicatrice, lens present, though distorted.....	148.
146. Clypeus bearing pair of small black spots.....	<i>regnata</i> .
Clypeus without black spots.....	147.
147. Sixth tergite and sixth sternite maculated.....	<i>persimilis</i> .
Sixth tergite and sixth sternite black.....	<i>hexaspila</i> .
148. Lateral spots on sternites 2-5; apex of sixth sternite yellow.....	<i>U-scripta</i> .
Lateral spots on sternites 2-4; sixth sternite black.....	<i>arcuata</i> .
149. Mandibles slender, teeth reduced to a single vestige; all tergites and all sternites (including apical part of sixth) with continuous fasciae.....	<i>occidentalis</i> .
Mandibles with at least one evident tooth; maculations of tergites and sternites not as given above.....	150.
150. Labrum unusually long (fig. 215); ultimate tergite rugose (fig. 216).....	<i>rugosa</i> .
Labrum normal; ultimate tergite punctate.....	151.

151. Clypeus black or marked with black-----152.  
 Clypeus not marked with black-----173.
152. Apical part of the terminal segment of all tarsi black above: no black above elsewhere on tarsi-----*torosa*.  
 Apical part of the terminal segment of all tarsi not black above; or if so, then other parts of tarsi also black above-----153.
153. Fasciae on all tergites interrupted medially-----166.  
 All or at least some of the fasciae on tergites continuous-----154.
154. Anterior metatarsus dilated and flattened (fig. 219)-----155.  
 Anterior metatarsus normal-----156.
155. Dorsum of propodeum bearing a well-developed fascia-----*borneana*.  
 Dorsum of propodeum without fascia-----*palmata*.
156. Fasciae on tergites 1-5 continuous, or all continuous except that on fifth tergite-----157.  
 Fasciae, except that on first tergite (and sometimes that on fifth tergite also), continuous-----168.
157. Labrum black or with medial black stripe-----158.  
 Labrum not marked with black-----159.
158. Sides of thorax with conspicuous maculations-----*levis*.  
 Sides of thorax black or with only inconspicuous pale maculations-----*velox*.
159. Scape entirely black-----160.  
 Scape with maculation below, sometimes very small-----161.
160. Scutum with unbroken U-shaped discal mark; mesopleura bearing large yellow maculation-----*nigrocornuta*.  
 Scutum with pair of discal lines (rarely with broken U-shaped mark); mesopleura black or with small spot below wings-----*oculata*.
161. Second and third sternites with broad fasciae-----*seculata*.  
 Second and third sternites with lateral spots (sometimes connected by fine apical lines)-----162.
162. Frons wider than the eye viewed from in front; that is, the frons makes up more than one-third of the total width of the head-----163.  
 Frons not wider than the width of the eye seen from in front-----*orientalis*.
163. Posterior orbits very broad and above extended mesad on the occiput beyond the inner margins of the eyes at the vertex; proboscis when at rest not wholly retracted beneath the labrum-----*spiritalis*.  
 Posterior orbits not usually broad and not extended beyond the inner margins of the eyes; proboscis when at rest completely retracted beneath the labrum-----164.
164. Length 18-20 mm-----*melancholica*.  
 Length less than 18 mm-----165.
165. Fasciae on tergites yellow; first roundly biemarginate on anterior dorsal border-----*borrei*.  
 Fasciae on tergites pale; first not biemarginate on anterior border.  
*opinabilis*.
166. Black on clypeus in form of basal spots, entirely separate or united at base of clypeus; terminal segment of tarsi without dusky spot above-----167.  
 Black on clypeus a solid band or covering the entire clypeus; terminal segment of tarsi with dusky spot above-----*multipicta*.
167. Lateral spots on sternites prominent and extending along apical margin of sternite toward midline or joined by apical lines-----*frioensis*.  
 Lateral spots on sternites much reduced or lacking; not connected by apical lines-----*pugillatrix*.

168. Ultimate tergite black.....169.  
 Ultimate tergite maculated.....170.
169. Labrum black.....*helianthopolis*.  
 Labrum not black.....*opinabilis*.
170. Small, 17 mm. or less in length.....171.  
 Large, 20 mm. or more in length (African).....*longipennis*.
171. Discal mark on scutum in form of broad unbroken U; maculation of sixth tergite a pair of lateral spots.....172  
 Discal mark on scutum not in form of unbroken U; maculation of sixth tergite an apical spot.....*trogloodytes*.
172. Second sternite wholly yellow; sixth sternite maculated.....*latifasciata*.  
 Second sternite with large median black spot; sixth sternite black.....*laeta*.
173. Dorsal border of clypeus at the midline extended upward in the form of an angle whose apex is above the lower level of the insertion of the antennae; second sternite uniformly and finely punctate with a very few somewhat larger punctures interspersed.....*bellatrix*.  
 Clypeus and second sternite not developed as given above.....174.
174. Discal mark on scutum in form of U, complete or broken (sometimes only the posterior transverse spots remain).....175.  
 Discal mark on scutum a pair of narrow longitudinal lines.....186.
175. Sixth tergite showing well-developed lateral ridges.....*generosa*.  
 Sixth tergite with weakly developed lateral ridges or with none at all.....176.
176. Second and third sternites broadly banded with yellow.....177.  
 Second and third sternites not broadly banded with yellow, but bearing lateral spots.....180.
177. Fasciae on all tergites continuous.....178.  
 Fasciae on all tergites, or on all but the second tergite, interrupted.  
*piraporae*.
178. Ultimate tergite yellow (bearing a single maculation).....179.  
 Ultimate tergite bearing pair of lateral maculations.....*trepanda*.
179. Fascia on first tergite with pair of black spots almost inclosed; length 17 mm.....*latifrons*.  
 Fascia on first tergite showing only broad, shallow, anterior emarginations; length 14 mm.....*spatulata*.
180. Fasciae on all tergites interrupted (on some specimens that on second tergite is continuous, but greatly narrowed at midline).....*insularis*.  
 Fasciae on tergites usually all continuous (on one species the fasciae on first tergite and on another species those on third and fourth tergites interrupted).....181.
181. Propodeum, especially its lateral angles, covered with long dense pubescence (maculations pale faded yellow).....*mediterranea*.  
 Propodeum showing only normal pubescence.....182.
182. Length 15 mm. or less.....183.  
 Length greater than 15 mm.....184.
183. Both tergite and sternite of sixth abdominal segment maculated.....*raptor*.  
 Neither tergite nor sternite of sixth abdominal segment maculated.....*fucosa*.
184. Mesosternum black.....*sayi*.  
 Mesosternum maculated.....185.
185. Sixth tergite black.....*taiwana*.  
 Sixth tergite maculated.....*incognita*.
186. Fasciae on tergites white or pale.....*primaestate*.  
 Fasciae on tergites yellow.....187.

187. Fascia absent on metanotum.....	188.
Fascia present on metanotum.....	similans.
188. Fasciae on all tergites continuous.....	zonata.
Fasciae on first tergite always interrupted; sometimes other fasciae also interrupted.....	muscipapa.

BEMBIX REGIA, new species

Figures 172-178

*Type* (male).—Black: labrum except median stripe; mandibles, except tips; narrow apical border and lateral spots on clypeus; small spot on scape below; small round spot on either side of anterior ocellus; minute spot between antennae; posterior orbits broad below, narrow above; posterior border of pronotum; sides of prothorax almost entirely; narrow lateral line on scutum above base of wings; curved, interrupted fascia on posterior border of scutellum; interrupted fascia on metanotum; curved fascia on propodeum, broadest on posterior surface; lateral angles and almost entire sides of propodeum; large spot on metapleura; mesopleura and mesosternum almost wholly; widely separated lateral spots on first tergite, broad at lateral end and narrowed to a point at dorsal end; continuous fasciae on tergites 2-4, that on second almost inclosing a pair of discal spots, those on third and fourth biemarginate on anterior border; lateral spots on tergites 5 and 6; lateral spots on sternites 2-5; legs except black line above on anterior femora, black line below and broken line above on anterior tibiae, black spot above at base of the other tibiae and black spot below on each segment of anterior and middle tarsi; *yellow*. On some parts of the body the yellow has a greenish tinge and the dorsal part of the tergal fasciae is pale.

The antennae are stout, the scape being unusually thick and heavy. Segments 9-11 of the flagellum are broadened and flattened below but are not much excavated, the surface being only slightly concave. The apical segment is rounded, slightly curved and truncate at the apex. The spines of the anterior metatarsus, of which one bears seven and the other six, are peculiar in form, most of them, but not all, being broad, flat, and stout (fig. 177). The intermediate femora are dentate, each bearing at the base a single stout spine and apical to this a series of very small spines. The middle tibia on its inner side shows a slight swelling at the apical end. The middle metatarsus is strongly curved and compressed. Below at its proximal end is a slight protuberance covered with fine stiff hairs and the anterior border at the apical end is developed into a broad, thin, wedgelike process (fig. 174). This is true also of the second segment, and to a less degree of the third. The second sternite bears a



prominent carina and the sixth a very narrow median process, whose ventral surface is concave and whose apex resembles a carina. It does not reach the apex of the sternite. The seventh sternite bears a median carina. The sides of the seventh tergite are gently sinuate and the apex is broad and round. Lateral ridges are present but not at all prominent. The eighth sternite ends in a relatively short, curved, hirsute spine that, near its middle, is much dilated along its dorsal margin (fig. 178).

*Allotype* (female).—Black: narrow dorsal border and broader lateral borders of labrum; very narrow border and narrow lateral stripe on clypeus; pair of small spots between antennae; pair of rounded spots near anterior ocellus; trace of anterior orbits opposite antennae; posterior orbits broad below, narrowed and shortened above; posterior border of pronotum; side of prothorax, except large lateral spot that covers much of the tubercle; narrow lateral lines and narrow, transverse discal line on scutum; narrow fascia on posterior border of scutellum; narrow fascia on posterior border of metanotum; curved fascia on propodeum, widened and interrupted on its posterior surface; spot on posterior lateral angles extended to form an interrupted fascia on ventral part of posterior surface of propodeum; vertical anterior stripe on side of propodeum; metapleura almost entirely; triangular spot with longer leg vertical and shorter leg longitudinal on mesopleura; widely separated lateral spots on first tergite; fascia on second tergite, notched at midline on anterior border, broadly emarginate on median posterior dorsal border, and enclosing a pair of elliptical black spots; fascia on third tergite similar to that on second but with emarginations representing the discal spots; narrow, interrupted fascia on fourth tergite; small widely separated lateral spots on fifth; small lateral spots on sternites 2-4; line above and below on femora; tibiae, except black line above and below; and tarsi, except black spot below on anterior metatarsus; *yellow*.

The flagellum is black with a fuscous line below on all segments. The wings are slightly and uniformly infumated. The anterior metatarsus bears six broad, black spines whose dorsal surface is concave. The disk of the second sternite is smooth and shining and bears scattered coarse punctures. The sixth tergite is roundly triangular at the apex and is densely punctate except at the extreme posterior end. The labrum bears a distinct longitudinal carina that broadens near the apex where it is distinctly grooved (figs. 172, 173).

The paratype differs but slightly from the allotype; the clypeus, frons, and labrum have less yellow on them and the carina of the labrum is less conspicuous at the base.

Length 17 mm. Described from a male bearing the label "Neu-Kamerun No. 218-21 Tessimann S. S.," and two females with the label, "Leubo Congo, D. W. Snyder."

*Type*.—In the Zoologisches Museum der Universität, Berlin.

*Allotype*.—Cat. No. 40837, U.S.N.M.

BEMBIX MIMA Handlirsch

Figures 134-137

*Bembex mima* HANDLIRSCH, Sitz Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 795.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 508.

Of this species I have before me two specimens, a male bearing the label "Mexico, Distrito Federal, J. R. Inda, Collector," and a female bearing the label, "Guadalajara, Jalisco, Mex., IX, 14, McClendon." This species is distinguished by the presence on both sexes of a prominent median transverse notch on the labrum and of a well-defined apical pygidial area on the last tergite, set off by short but evident lateral ridges. Handlirsch described this species from a single female and I am therefore giving below a detailed description of these two specimens.

*Male*.—Black: Labrum; mandibles, except tips; clypeus, except narrow basal border; scape below; spot between antennae; broad but short anterior orbits; broad posterior orbits narrowed and abbreviated above; spot on side of prothorax; fascia on posterior border of prothorax including tubercles but interrupted dorsally at midline; narrow lateral line on scutum above base of wings; narrow curved fascia enlarged laterally on scutellum; narrow curved fascia on metanotum; spot on metapleura; fascia on first tergite broken into lateral spots and median dorsal spot; fasciae on second and third tergites interrupted medially and emarginate on anterior border on either side the middorsal line; fasciae on fourth, fifth, and sixth tergites broken into spots; large median spot on apex of seventh tergite; small lateral spots on second sternite; anterior border of femora of first pair of legs; anterior distal end of femora of second and third pairs; all tibiae, except black line on posterior border; and tarsi; *yellow*.

The female closely resembles the male but with the maculations a little more extensive. The black on the clypeus is restricted to a pair of small spots; there is a broken U-shaped discal mark on the scutum; a broad interrupted fascia on the propodeum and a spot on its side; the mesopleura almost entirely yellow; and lateral spots on sternites 2 and 3. In other respects the maculations are very similar to those on the male.

The flagellum is black above, yellow or ferruginous below, and segments 8-11 of the male are somewhat prominent on their posterior distal border but can not be termed spinose. The labrum bears a prominent, transverse median notch whose lower border assumes somewhat the form of a tooth. The sixth tergite of the female and the seventh of the male bear an evident apical pygidial area set off by short lateral ridges. The anterior metatarsus is provided with eight spines. The infumation of the wings is slight, although a little more evident in the female and a little more uniform than in the male. The pubescence is short and fairly dense on the head, thorax, and propodeum; gray on the head, sides of thorax, and on the propodeum; brownish on the scutum. The posterior border of the middle femur of the male does not bear evident teeth or spines. The second sternite of the male bears a prominent median process and the sixth a conspicuous, short, median tooth bluntly rounded at the point. The genital stipes is distinct in form as shown in Figure 136.

BEMBIX TAIWANA Bischoff

*Bembix taiwana* BISCHOFF, Deutsch. Ent. Zeitschr., Heft., 7, 1913, p. 712.

Of this species I have before me a male and a female identified by Bischoff. The pubescence on the head, thorax, and propodeum of the male is almost white, not unusually long but unusually dense, especially on the scutum. The scutum, except for very inconspicuous lines above the base of the wings, is entirely black; the scutellum bears a narrow fascia; the maculations of the metanotum, the propodeum, and the sides and venter of the thorax are so extensive as to render these parts almost devoid of black. The color is a pale, clay-colored yellow. The tergites are wholly of this color, the first, second, third, and fourth each bearing a pair of much reduced, transverse, black spots or lines. Segments 10 and 11 of the flagellum bear prominent excavations, and 7-9 are somewhat spinose. The posterior border of the middle femur is smooth but is much compressed and wedgelike. The second sternite shows only a trace of a carina and the sixth a low, roundly-pointed, triangular prominence. The seventh tergite is deeply emarginate at the apex and at the base there is a pair of short but distinct lateral ridges whose posterior ends do not form spines or sharp angles.

The color on the female is a more decided yellow. The scutum bears a pair of posterior, median discal marks; the fascia on the scutellum is interrupted; and the yellow on the metanotum and dorsum of the propodeum is less extensive than on the male. The side of the thorax and the propodeum are similar to those of the male. The fasciae on the tergites are less extensive than those on



the male, leaving a black posterior border on each tergite. The sixth tergite is black and the maculations on sternites 2-5 are reduced to lateral spots. The two specimens bear a common label, "S. Formosa, Taihanroku, 3.-10. VIII. 08, Sauter."

BEMBIX FUCOSA, new species

Figures 104-106

*Type* (male).—Black: labrum; mandibles, except tips; clypeus; frons below anterior ocellus, except pair of large black spots; scape, except spot above; anterior orbits deflected inward and interrupted at anterior ocellus; posterior orbits broad below, narrow above; prothorax almost wholly; broad lateral lines and broken U-shaped mark on scutum; narrow fascia on posterior border of scutellum enlarged laterally; fascia on metanotum; prominent curved fascia on posterior and dorsal surface of propodeum; lateral angle and side of propodeum; metapleura and mesopleura almost entirely; fasciae on tergites 1-5 continuous, on 6 interrupted; first fascia narrowed dorsally and bisinuate dorsally on anterior border; second inclosing a pair of elliptical black spots and deeply and acutely emarginate on posterior border at dorsal midline; third similar to second but with dorsal elliptical spots not entirely enclosed; fourth and fifth bisinuate on anterior margin and very deeply and acutely emarginate on posterior margin at midline; lateral spots on sternites 2-5, those on sternites 2 and 3 almost united by apical prolongations; legs, except black anterior spot on middle and posterior coxae, black spot on trochanters, black line above on anterior femur, and black spot below on all tibiae; *creamy white or bright yellow*. The maculations on the head (except the frons in part and the lower part of the posterior orbits), the posterior line on scutum, fasciae on scutellum and metanotum, and the dorsal part of the fasciae on the tergites are pale, creamy white. The longitudinal discal lines on the scutum and the lower part of the large spot on the mesopleura are decidedly rufous. Elsewhere the maculations are yellow.

The antennae are dark above, fuscous below. Segments 7-10 of the flagellum are dilated and obtusely prominent on posterior margin. Segments 9-11 are excavated below and segment 12 is flattened toward the apex, roundly pointed and strongly curved. The middle femur is dentate below. The second sternite bears a prominent, compressed, bluntly pointed process. The process on the sixth sternite is peculiar in that its base is a transverse swelling, from the median part of which a carina, broad at base but narrowed to an edge at apex, extends in a curve to the apical margin of the sternite. The seventh sternite is strongly carinate on midline. The seventh tergite bears conspicuous lateral ridges and is roundly pointed at the apex.



The *allotype* (female) in the character of its maculations differs but little from the type. The anterior orbits are not interrupted and are continuous with the posterior orbits; the U-shaped discal mark on the scutum is broader and unbroken; the fasciae on the tergites are all continuous, broader than on the type, and both second and third inclose paired black spots. The yellow of the maculations is more intense than on the type, only the clypeus, frons, and labrum showing evidence of creamy white. Like the type, the discal mark on scutum and the spot on mesopleura show a strong rufous coloration. The disk of the second sternite is smooth and shining and bears scattered coarse punctures. The sixth sternite is slightly carinate.

The wings in this species are hyaline, and the second abscissa of the cubitella is absent or rudimentary. The pubescence is of normal character. The anterior metatarsus bears seven spines. The frons between the antennae and the basal part of the clypeus are carinate. On one female paratype the fascia on the first tergite bears a pair of rounded black spots and on one male paratype the fascia on the fifth tergite, as well as that on the sixth, is interrupted at midline.

Length 15 mm. Described from three males and four females, of which number six bear the label "Ober-Burma, Mandalay, 26. 8. 00, Coll. Bingham." The seventh (a female) bears the same label but with the date reading "2. 9. 00."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

BEMBIX LOUPATA, new species

Figures 123-126

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except pair of small black spots; frons between antennae; pair of small spots on frons near anterior ocellus; scape below; broad but short anterior orbits; posterior orbits narrowed above; posterior border of pronotum; side of prothorax, except black spot that includes most of tubercle; small lateral spot on scutum above base of wings; fascia on scutellum reduced to narrow widely separated lines; narrow elongated spot on mesopleura; fascia on first tergite interrupted and parts narrowed to a point at mid-dorsal line; fascia on second broad laterally, widely, and deeply emarginate (the emarginations prolonged to right and left) and acutely notched on anterior border and slightly emarginate at midline on posterior border; fasciae on third and fourth tergites similar to that on second but with emarginations less pronounced; that on fifth tergite broad and only slightly narrowed at midline; that on sixth also broad and almost interrupted at midline; lateral spots on sternites 2-6 connected by apical lines, except those on sternite 6; femora, except

above and below basally; tibiae, except spot below on anterior pair and basally above on all; and tarsi; *pale with a tinge of yellow* on the labrum and on the lateral portions of the tergal fasciae. The anterior part of the apical lines connecting the lateral sternal spots is tinged with ferruginous.

The flagellum is dark above, lighter below, and at the apex takes on a ferruginous appearance. Segments 9, 10, and 11 are slightly excavated below, and 7 and 8 are spinose. The ultimate segment is slightly curved, somewhat flattened and pointed at the apex. The middle femur below is beset with several sharp-pointed teeth that are longest near the apex of the femur, which on its posterior surface bears a distinct longitudinal depression or groove. The second sternite bears a long, low, thin carinalike process that ends in a blunt point. The sixth sternite is peculiar in that it bears a median triangular swelling that can not be termed a process, since its apical part slopes smoothly to the apical margin of the sternite, which shows a slight median apical emargination. The seventh sternite shows a prominent median carina and is distinctly notched at the apex. The seventh tergite on either side bears a distinct lateral ridge with an emargination producing a lateral angle and bears within this angle several short spinelike hairs. The apex of the tergite is relatively broad and roundly truncate.

*Allotype* (female).—Black: labrum; mandibles, except tips; apical border of clypeus; spots on frons; scape and flagellum below; anterior and posterior orbits; apex of sixth tergite; sixth sternite; fasciae joining lateral spots on sternites; legs except basal segments and more or less of the basal part of all femora; *ferruginous*. Narrow line on posterior border of pronotum; posterior part of tubercle; narrow fascia on posterior border of scutellum; narrow fascia on metanotum; narrow abbreviated fascia on propodeum; small spot on lateral angles of propodeum; continuous fasciae on tergites 1–5: first narrowed medially; second inclosing pair of dorcal black spots; third, fourth, and fifth biemarginate on anterior dorsal border and acutely sinuate at mid line on posterior border; and lateral spots on sternites; *pale*. Traces of yellow are seen on the labrum, on the extreme lateral portions of the tergal fasciae and on the tibiae. The sixth sternite is carinate on the mid line and the sixth tergite, which is narrow and rounded at the apex, is covered with spinelike hairs very prominent laterally at the base.

Length 14–16 mm. Described from three specimens. The type and allotype bear the label, "Deutsch Ost Afrika, Kanoga, Fr. Muller S." A second female, which I have referred to this species, bears the label, "Victoria-Nyansa, I. Ukerewe, Conrads S. G." This differs from the allotype in having the labrum light yellow, the abdominal fasciae brighter with a creamy yellowish tinge. The ferruginous fasciae

connecting the lateral sternal spots are much obscured and the propodeum is wholly black.

*Type* (male).—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX RESIDUA, new species**

Figs. 184-186

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except pair of large basal black spots; scape below; frons between and above insertion of antennae, except pair of narrow vertical lines between antennae; broad, short anterior orbits; posterior orbits narrowed above; posterior border of pronotum; side of prothorax almost entirely; spot on tegula; small lateral spot on scutum at base of wings; small lateral spots on scutellum; fascia on anterior border of metanotum not reaching its lateral margins; broad curved fascia on dorsum and posterior surface of propodeum; lateral angles and nearly the entire sides of propodeum; metapleura; mesopleura, except black spot behind tubercle and another in front and above middle coxa; mesosternum; very broad fasciae on tergites 1-6; fascia on first tergite broadly and shallowly bisinuate on anterior dorsal margin and more deeply and more acutely bisinuate on posterior dorsal margin; second and third fasciae each inclosing a pair of narrow, elongated, elliptical dorsal black spots and somewhat irregular on dorsal margin; fourth and fifth each biemarginate on anterior dorsal border and slightly emarginate on posterior border at midline; sixth slightly bisinuate on anterior border, slightly emarginate at midline on posterior border, and shortened laterally; seventh tergite, except basal lateral black areas; lateral spots on sternites 2-6; legs, except spot below on posterior coxae, spot on all trochanters. line above on all femora. line above and below on all tibiae, and spot below on each segment of all tarsi; *pale or soiled yellowish white*.

The flagellum is black and segments 8 and 9 are spinose. Segments 10 and 11 are excavated below and are somewhat dilated. Segment 12 is very slightly curved and is rather sharply pointed at the apex. The frons between the antennae and to a less extent the basal part of the clypeus are carinate. The anterior metatarsus is provided with six spines, of which the proximal one is quite small. The middle femora are weakly serrato-dentate. The process on the second sternite is a low median carina ending posteriorly in a short blunt point. The sixth sternite bears a low broadly triangular, obtusely pointed process and the seventh is strongly carinate on the midline. The seventh tergite, which is slightly sinuate laterally, truncate apically, and slightly emarginate at apical midline, bears short but evident lateral ridges. The wings are very slightly but uniformly infumated. The pubescence is short, dense, and gray on



head, thorax and propodeum, except on the scutum and scutellum, where it is unusually short and brown in color. The sixth tergite, and to a less degree the fifth and fourth also, are covered with relatively long black pubescence. The inner eye-margins are slightly divergent at the clypeus.

This species stands close to *B. taiwana* Bischoff from which it differs in the character of its maculations, in the character of the pubescence on the scutum, and in the better development of the processes on sternites two and six.

Length 22 mm. Described from a single male bearing the labels, "China, Tsha-jiu-san, V.-VI. 12, Mell S. V.," and "Berggebiet i. N. v. Kuangtung, Bambuswald, ca. 1400 m Hoch."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX RECURVA, new species**

Figures 165-168

*Type* (male).—Black: lateral borders of labrum; narrow apical band and extreme lateral borders of clypeus; short anterior orbits broadened just above insertion of antennae; broad posterior orbits, narrowed above and not extended to vertex; spot on side of prothorax extending to tubercle; median bilobed spot on postero-dorsal surface of propodeum; lateral angles of propodeum; spot on anterior part of mesosternum; broad fascia on first tergite enclosing a round black spot near anterior margin on left side of midline and having a broad rounded anterior emargination on right side; broad fascia on second tergite inclosing pair of elliptical dorsal spots; narrow fascia on third tergite greatly shortened at the side; pair of lateral spots on second sternite; femora in part; tibiae, except line above on first pair and line below on second and third pairs; tarsi, except apical part of terminal segment of all pairs and posterior border of metatarsus of first pair; *yellow*.

The flagellum is black above but not wholly so below, and segments 7, 8, and 9 are slightly spinose. Segments 10, 11, and 12 are slightly excavated, and 12 which is as long as 10 and 11 combined, is curved, and is also narrowed toward the apex, which is roundly pointed. The posterior border of the middle femur is somewhat undulate and near its distal end bears two blunt rounded teeth. The second sternite bears a weakly developed median process and the sixth a well-developed, narrow, flattened, bluntly pointed process that extends slightly beyond the apex of the sternite. The seventh tergite is broadly and bluntly rounded at the apex. It is slightly sinuate laterally and bears a pair of lateral ridges that stand out prominently when the tergite is viewed from the side.



*Allotype* (female).—Black: extreme apical, lateral angles of clypeus; spot below on scape; spot on either side anterior ocellus; *obscure yellow*. Posterior orbits not reaching vertex; narrow line below tubercle on prothorax; fascia narrowed laterally on posterior surface of propodeum; lateral angles of propodeum; broad fascia on first tergite with broad, shallow, median anterior emargination; fascia on second tergite inclosing a pair of elliptical dorsal black spots; small lateral spots on second sternite; femora apically in part; anterior surface of anterior tibiae; outer surface of middle and posterior tibiae; *bright creamy yellow*. The yellow of the tarsi is obscured by brownish or ferruginous. The posterior surface of the anterior metatarsus, as in the type, is black. The sixth tergite is bluntly rounded at the apex. The sixth sternite bears numerous coarse punctures, especially near the apex, among which are many very fine punctures. The second sternite is slightly carinate on the midline, shining and provided with scattered coarse punctures.

The wings in this species are hyaline and the pubescence is very short and inconspicuous. The posterior lateral angles of the propodeum are unusually prominent in this species, giving the posterior surface of this segment somewhat the shape and appearance found in the genus *Bicyrtes*.

I have assigned to this species two other males that differ markedly from the type in the extent of their maculations. On each of these the labrum is wholly yellow; the clypeus bears only a small pair of black spots; the prothorax is almost wholly yellow; there are lateral spots on the scutellum, a fascia on the metanotum, a curved fascia on the propodeum, and a small spot on the mesopleura. On one there are broad fasciae on the first six tergites, the second inclosing black spots, whereas on the other the fasciae are limited to the first three tergites, the second fascia inclosing black spots. I have placed these specimens in this species in spite of the fact that they differ so widely in the extent of their maculations and are slightly larger in size, because I can find no essential difference in the morphological characters of the three males and because no two of them agree in the extent of their maculations.

Length, 22 mm. Described from three males and one female. The type<sup>5</sup> and allotype are from Neu-Kamerun, collected by Tessmann.

<sup>5</sup> The specimen designated as the type of this species is in bad condition. When received for study the sixth and seventh abdominal segments were completely retracted so that the specimen had to be relaxed before it could be studied. At some previous time it had decomposed to such an extent that not only has the color faded but as soon as it was relaxed it fell into pieces and had to be reassembled after the genitalia had been extracted and the terminal abdominal segments extended. After the description had been written the genitalia of the type, through an unhappy accident, was lost, but not before the author had made a careful comparison of the genitalia of the type and paratypes and assured himself that there were no differences between them discernible.

The two paratypes (males), collected by Riggenbach, bear the following labels: The one, "Kamerun int. Garua." and the other, "Kamerun Tsad-See a. Benne unterh. Garua."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

BEMBIX LEVIS, new species

Figures 116–118

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except a pair of elliptical spots; scape below; spot between and above antennae; broad anterior orbits shortened above; posterior orbits narrowed above; posterior dorsal border of prothorax; sides of prothorax almost entirely; spot on tegula; narrow line on scutum above tegula; curved fascia on posterior border of scutellum; narrow fascia on posterior border of metanotum; broken fascia on dorsum of propodeum; lateral angles and spot on sides of propodeum; narrow line on metapleura; large spot almost divided into two on mesopleura; continuous fasciae on tergites 1–5, first deeply sinuate on anterior median margin, second inclosing almost completely a pair of dorsal black spots and emarginate on posterior median border, remainder bisinuate on anterior border and emarginate on posterior median border; obscure spots on tergite six; lateral spots on sternites 2–4; spot on coxae; femora in greater part; tibiae, except lines below and on posterior border; tarsi, except terminal segment of each; *white* with a slight tinge of *creamy yellow* in some places.

The flagellum is black and segment seven is bluntly but quite evidently spinose. Segments 9–11 are slightly excavated and segment 12 is flattened, distinctly curved, and roundly truncate at the apex, which is ferruginous in color. The intermediate femora are not considered serrate or dentate, although the apical end of the posterior border is slightly roughened. The middle tibiae and tarsi are normal. The anterior metatarsus bears six spines. The second sternite (on the type) bears an evident median carina that does not end in a process or spine. The second sternite of the male paratype bears a large, curved, sharply pointed process whose ventral surface is slightly concave. The seventh sternite is carinate on midline. The seventh tergite is deeply sinuate on either side apically, causing the tergite to end in a blunt point (fig. 118).

The *allotype* (female), though resembling the type closely, differs in maculations as follows: The labrum and clypeus are black, except narrow lateral borders; the scape is wholly black; spot at the insertion of antennae is much reduced; the scutum bears a broken U-shaped discal mark; the fascia on the propodeum is complete; the fascia on the second tergite (and probably that on the third, which is much retracted) bears a pair of completely inclosed discal spots; fascia

on fifth tergite is interrupted at midline; the spots on the sides of the thorax and propodeum are better developed; and the color in general is slightly more yellowish.

The wings on both sexes are hyaline and relatively long. The pubescence is short, white and sparse. The disk of the second sternite of the female is shining and bears numerous coarse punctures. On three of the female paratypes the fascia on the fifth tergite is continuous, and on two the scutum bears only the transverse posterior discal mark. On some the fascia on the third tergite incloses a pair of black discal marks.

Length 15 mm. Described from two males and five females from Africa. These specimens bear labels as follows: Type and allotype, "Neu-Kamerun, No. 153-67, Tessmann S. G."; male paratype, "Belg. Kongo, Duma, Ubanga-Dist., Dr. H. Schubotz leg., 20. X. 1910."; two females paratypes, the label, "Bosun, 545, 22.4.14, Tessmann."; another, the label, "Kamerun, Tsad-See, Garua, 21. VIII. 1909. Riggensbach S. G."; and the fourth, the label, "Kamerun, Schafer S. G."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX OPINABILIS, new species**

Figures 149-152

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except small pair of black spots; space between antennae extending upward; pair of spots near anterior ocellus; scape below; anterior orbits shortened above; narrow posterior orbits; narrow posterior border of pronotum and side of prothorax, except large irregular black spot extending into tubercle; narrow lateral line on scutum above base of wings; narrow fascia on posterior border of scutellum; narrow fascia on metanotum; large posterior spot and narrow anterior vertical line on side of propodeum; spot on metapleura; long vertical spot on mesopleura; broad continuous fasciae on tergites 1-6, first narrowed medially, second inclosing pair of black spots, third almost completely inclosing pair of black spots, the others biemarginate on anterior border and all fasciae to a greater or less degree sinuate on posterior median border; lateral spots on sternites 2-6; femora, except spot at base below and line above on all; tibiae, save line above and below on all; and tarsi; *pale or light yellow*. The labrum, the lateral spots of thorax and propodeum, the lateral sternal spots, and the legs show a preponderance of yellow.

The flagellum is black above, light below, the ultimate segment becoming ferruginous at the apex. Segments 6, 7, and 8 are spinose below, but the spines are not conspicuous; segment 5 is prominent below but not spinose. Segments 9-11 are slightly excavated below



and segment twelve is curved, flattened toward the apex, which is bluntly rounded. The middle femur below near the apex is slightly roughened but can not be said to be dentate. The second sternite bears a median sharp-pointed process and the sixth a small wedge-shaped process whose apex does not extend to the apical border of the sternite. The seventh bears a median carina. The seventh tergite is coarsely punctate and bears distinct lateral ridges but shows neither lateral angles nor lateral spines. It is sinuate laterally and is broadly rounded at the apex, which is slightly emarginate at midline.

*Allotype* (female).—Black: labrum; mandibles, except tips; clypeus, except pair of large black spots; pair of small spots on frons near vertex; broad anterior orbits shortened above; posterior orbits; sinuate fascia on posterior border of pronotum; side of prothorax, except irregular longitudinal spot which includes anterior part of tubercle; narrow lateral line above base of wings and broken transverse posterior discal mark on scutum; narrow fascia on posterior and lateral margins of scutellum; narrow fascia on metanotum; narrow curved fascia on propodeum, extended, enlarged, and interrupted on its posterior surface; spot on lateral angle and larger anterior spot on side of propodeum; spot on metapleura; large spot on mesopleura; continuous fasciae on tergites 1-5, first much narrowed medially, second inclosing pair of black spots and deeply emarginate at anterior midline, third inclosing pair of black spots, fourth and fifth biemarginate on anterior border and together with the second and third all strongly sinuate at posterior median border; lateral spots on sternites 2-5 extended inward but not forming continuous apical lines; femora in part; tibiae, except line above and below on all; and tarsi; *pale or soiled white*.

The flagellum is black above, ferruginous below, becoming much lighter in color toward the apex. The second sternite is shining and bears numerous coarse punctures scattered over the disk, and the sixth is coarsely punctate and distinctly carinate medially on its apical half. The sixth tergite is slightly sinuate laterally and much narrowed toward the apex, which is roundly pointed.

The wings of this species are hyaline and the second abscissa of both radiella and cubitella is present. The pubescence on head, thorax, propodeum, and base of abdomen is long, dense, and whitish in color. The frons between the antennae and the base of the clypeus are distinctly carinate. Of the female paratypes, two differ from the allotype in having a pair of narrow discal lines in addition to the broken transverse line on the scutum; while a third differs in having no discal mark on the scutum and in having the fascia on

the scutellum and the fascia on the first tergite interrupted at the midline.

Length 15–17 mm. Described from four males and four females. The type, allotype and three male paratypes bear a common label: "D. O. Afrika, Kagera, Haobert S. G." Of the female paratypes each bears a different label: "Chinchoxo, Falkenstein S"; "D. O. Afrika Kiwugebiet, Dr. Kandt S"; and "D. O. Afrika, 50 km. ostl. v. Kosongo Urwald Grauer."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX MAGDALENA C. L. Fox**

FIGURES 127, 128

*Bembix magdalena* C. L. Fox, Proc. Cal. Acad. Sci., vol. 15, 1926, p. 220.

This is an unusually well-marked species. The labrum is abnormally long and the maxillae are longer than the labrum, extending backward well beyond the coxae of the anterior legs. In this elongation of the maxillae this species resembles those belonging to the genus *Steniolia*. The ocelli are not entirely obliterated. At the base the seventh tergite bears prominent lateral angles that are produced into short, blunt spines, and the apical portion of the tergite is strongly rugose. The first cubital cross vein is almost straight. The sixth sternite bears a broad median process whose posterior end terminates in two blunt prominences with a slight depression between them.

Fox describes this species from males taken at Magdalena Bay, Lower California, May 30, 1925, by H. H. Keifer.

**BEMBIX BIDENTATA Van der Linden**

*Bembex bidentata* VAN DER LINDEN, Nouv. Mem. Acad. Sci. Bruxelles, vol. 5, 1829, p. 11.—HANDLIERSCH, Sitz. Akad. Wissensch, Wien, Math.-Nat. Cl., vol. 102, 1893, p. 773.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 502.

The male of this species is well marked. The last three segments of the antenna are excavated below; the anterior metatarsus bears seven spines; the posterior border of the middle femur is compressed to a thin edge whose apical half is dentate; the second and sixth sternites are without tubercles; and the seventh tergite is without lateral ridges but is provided at the base with prominent lateral spines. The propodeum and the metathorax are black and the mesothorax is almost wholly black. The fascia on the first tergite is widely interrupted; those on 2–4 are continuous; that on tergite 5, continuous or broken into three spots. The sixth bears a single central maculation and the apex of the seventh is maculated.

I have at hand two males identified by Mercet and bearing the label, "Los Molinos [Spain], G. Mercet." This species is widely distributed throughout the Mediterranean region.

**BEMBIX TENUIFASCIATA, new species**

Figures 204-206

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except pair of large basal spots; scape below; spot between antennae; very short, broad anterior orbits; posterior orbits, very broad below, narrowed to a point and not reaching vertex above; posterior border of pronotum; side of prothorax and posterior half of tubercle; curved fascia on posterior part of scutellum continued forward laterally on scutum at base of wings, and narrowed and interrupted on midline; narrow interrupted fascia on metanotum; curved fascia on propodeum, broadest on posterior surface; lateral angle and almost the whole side of the propodeum; large spot on metapleura; large triangular spot on mesopleura; narrow interrupted fasciae on tergites 1-6, the first more widely interrupted than the others, all of which are bisinuate dorsally on the anterior margin, and second, third, and fourth are slightly sinuate laterally on posterior margin; continuous fasciae on posterior border of sternites 2-5; minute lateral spots on sternite 6; legs, except black lines on all femora and tibiae, and the black terminal segment on all tarsi; *yellow*.

The flagellum is black. The tenth, eleventh, and twelfth segments are excavated below but none are spinose. The middle femora are plain. The apical segment of each tarsus is black and the other segments of the tarsi show a greater or less degree of dark color below. The second sternite is plain and the sixth shows a moderate transverse swelling or elevation not sufficiently prominent to be called a process or tubercle. The seventh tergite at its base bears lateral spines similar to those borne by *bidentata*.

The *allotype* (female) in color and the character of the maculations is almost exactly like the type. It differs in that the pair of small lateral spots on the scutum at the base of the wings are more prominent; the fasciae on tergites 2 and 4 are continuous and the one on the fifth tergite is more widely interrupted than the one on the first; and the tarsi do not show the black markings seen on the type.

The wings in this species are slightly and uniformly infumated. The pubescence is short and relatively sparse. The anterior metatarsus is provided with seven spines. The disk of the second sternite of the female is smooth and shining and bears numerous coarse punctures, and the sixth is carinate on midline.



Length 16 mm. Described from two specimens, one male and one female, each of which bears the label, "W. Afrika, Lagos, Coll. Bingham."

*Type*.—In the Zoologisches Museum der Universität, Berlin.

**BEMBIX MOBII Handlirsch**

*Bembix mobii* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 775.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 508.

I have before me a single male that I have doubtfully referred to this species. With regard to the structural characters of the antenna, the middle femur, the seventh tergite, the second and sixth sternites, the wings, and the genitalia, it agrees quite well with Handlirsch's description of *mobii*, but with respect to the maculations it shows considerable difference. The flagellum is ferruginous, darker above than below, and very dark, though hardly black, at the apex; the scutum, scutellum, metanotum, propodeum, metapleura, and mesopleura (except a minute spot below the wings) are entirely black; the fascia on the first tergite is greatly narrowed and widely interrupted, those on tergites 2 and 3 are much broader and are narrowly interrupted at midline, while those on 4 and 5 are still broader and are continuous; the lateral spots on sternites 2-5 are large and are united by apical lines; and sternite 6 is ferruginous and bears a pair of small yellow lateral spots. In the absence of any significant structural differences between this form and the male of *mobii*, I have chosen to consider it simply a variant of that species, though further collection and study of material may show that it belongs to a different species. The specimen bears the label, "Bosum. 22-4-14. Tessmann."

**BEMBIX STENEBDOMA Parker**

*Bembix stenebdoma* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 79 (Key).  
*Bembix stenobdoma* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 94 (description of species).

The spelling of the specific name with an "o" in the text instead of an "e," as in the key and in the explanation of the figures illustrating the species, is simply a typographical error. The specific name is derived from two Greek words meaning "narrow" and "seventh," descriptive of the character of the seventh sternite, and the spelling *stenebdoma* is the correct one. The seventh tergite bears distinct lateral emarginations, thus giving rise to distinct roundly pointed lateral angles. This feature was omitted from the original description.

The species is known only from the type (a male) in the collection of the Academy of Natural Sciences of Philadelphia. It was taken at Florence, Ariz.

## BEMBIX MEDITERRANEA Handlirsch

*Bembex mediterranea* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 807.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 507.

For a discussion of the synonymy of this species the reader is referred to Handlirsch's treatment of the species. He proposed this name for the species because he could not determine to his own satisfaction to which, if any, of the previously described species (listed in his synonymy) the specimens before him belonged. When the identity of this species with that of a previously described species has been positively established (as in time it may be), this specific name will have to be set aside, but until that identity has been established it would only add to the confusion to refer to the species under any other name than the one given to it by Handlirsch.

There are in the United States National Museum a male from Italy and two males and three females bearing the label "Austria," all of which I have referred to this species. As represented by these specimens, the species is characterized by its pale, milky, yellowish color and by the unusually long pubescence on the propodeum. The tergites on the male, with the exception of a pair of small black discal spots on the second, are entirely pale yellow. The tergites on the female show a posterior black border. The middle femora of the male are dentate; the second and sixth sternites are without distinct processes, and the seventh tergite at the base bears distinct lateral angles.

## BEMBIX TOROSA, new species

Figures 210-214

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except pair of basal spots; anterior orbits; lower part of frons; triangular spot below anterior ocellus; scape below; posterior border of pronotum including the greater part of the tubercles; almost the entire side of prothorax; lateral lines on scutum; curved fascia on scutellum; metanotum; broad curved fascia on dorsum and posterior surface of propodeum; metapleura; large irregular spot on mesopleura; prominent continuous fasciae on tergites 1-6, those on tergites 2 and 3 inclosing pair of elliptical black spots and those on 1-5 more or less emarginate at mid-dorsal line on posterior border; apex of seventh; lateral spots on sternites 1-6; legs, except line above on femora, line below on all tibiae, apical black spots below on all segments of the tarsi (reduced on hind pair), and conspicuous black apical spot above on the ultimate segment of all tarsi; *yellowish white*.

The flagellum is black and segments 9-11 are excavated below, but none of the segments are spinose. The apical segment, which exceeds

in length the segment immediately preceding, is somewhat curved and is roundly and obliquely truncate at the apex. The apical half of the lower border of the middle femur is distinctly dentate. The second and sixth sternites are plain and the seventh bears a distinct median, longitudinal carina, which is bordered basally on either side by a short carina. The seventh tergite is deeply sinuate on either side, forming prominent lateral angles that are bluntly spinose and the short median portion is slightly but plainly emarginate at the apex. The spine of the eighth sternite seen from below shows lateral swellings near its middle part (fig. 211).

The maculations on the *allotype* (female) are quite similar in character to those of the type, but their color is yellow instead of white. In addition to the lateral lines, the scutum bears a broken U-shaped discal mark composed of narrow lines. The maculations on the side of the thorax and propodeum are somewhat better developed than on the type. The fasciae on the tergites are all continuous and the second and third inclose black spots. Those on tergites four and five are of similar pattern but whether the black spots are completely inclosed can not be determined, owing to the retracted condition of the segments. The spot on the apex of the terminal tergite is less extensive than on the type. The apical spots on the under side of the segments of the tarsi are not so prominent as on the type, particularly on the hinder pair, and the apical black spot above on the terminal segment of all tarsi, although present, is not so intense as on the type. The flagellum is black. No part of the disk of the second sternite is wholly free from punctures, but those on the central part are coarser and more widely separated than those on the sides or those near the basal and apical median borders.

Variation in the maculations of the paratypes is not great. One female has the sixth tergite black, the fascia on the first tergite interrupted, and that on the fifth broken into spots. On the male paratype from New Britain the fasciae on tergites 2-5 inclose each a pair of black spots and no doubt this may be true for some of the other specimens but the retraction of the segments conceals the evidence.

The wings are only slightly infumated, those of the female being almost hyaline. The anterior metatarsus bears five spines. The pubescence is short, gray, and inconspicuous. The second abscissa of both radiella and cubitella is present. This species seems closely related to Handlirsch's species *pugillatrix* and *papua*.

Length 18 mm. Described from four males and five females. Of these, three males and four females (including type and allotype) bear a common label, "Neu-Guinea, Ramu-Expedit." The fourth



male bears the label "Neu-Britannien Ralum, E. Dahl S." The fifth female bears the label "D. N. Guinea, But, 11. 1910, H. Schaeede S. G."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

BEMBIX QUINQUESPINOSA, new species

Figures 162-164

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except pair of large basal black spots; broad anterior orbits narrowed and shortened above; lower part of frons connected with a spot below anterior ocellus and inclosing a median black spot above insertion of antennae; scape below; posterior orbits broad below, obsolete above; narrow fascia on posterior border of pronotum; tubercle except black spot in center; side of prothorax almost wholly; short lateral line on scutum above base of wings; small narrow lateral spots on scutellum; narrow widely interrupted fascia on metanotum; broad curved fascia on dorsum of propodeum extended downward on its posterior surface to end in two points; posterior lateral angles of propodeum; broad vertical anterior stripe on side of propodeum; two spots on metapleura; anterior border of mesopleura extended backward and then at a right angle upward in a narrow line to base of wing; also rounded posterior spot near base of wings and narrow line above base of middle leg on mesopleura; broad anterior fasciae on tergites 1-6; that on first tergite with irregular borders and narrowed at middorsal line; that on second irregular on posterior border and inclosing a pair of long, narrow, elliptical discal spots; that on third tergite similar to the one on the second but with the discal spots not fully inclosed; those on fourth and fifth tergites widely biemarginate on anterior border and somewhat irregular on posterior border; that on sixth tergite narrower than the others and interrupted at middorsal line; lateral spots on sternites 2-5 decreasing in size from two to five; coxae and trochanters more or less; line above and below on femora; tibiae above, except short line on anterior and middle pairs; tarsi, except spot below on each segment of anterior pair and short basal line below on posterior pair; *white*. The tarsi are somewhat tawny and the apical segment of each above is more or less dusky, the posterior ones being almost black.

The pubescence is short, white, and inconspicuous. The wings are very slightly and uniformly infumated. The frons between the antennae is carinate and strongly elevated and this elevation is continued on the base of the clypeus, causing the clypeus on either side at its base to appear strongly depressed. Segments 6 and 7 of the flagellum bear small pits below; 8 and 9 are distinctly spinose:

10 and 11 are deeply excavated; and segment 12, which is longer than the preceding segment, is strongly curved, squarely truncate at the apex, and its posterior apical angle forms an evident point. The anterior metatarsus is broad and bears five stout spines. The middle femur is plain. The second sternite is plain and the sixth has at its middle a low, rounded elevation that can not be classed as a tubercle or process. The seventh bears an evident median carina bordered on either side basally by a less evident carina. The seventh tergite bears a pair of evident, nonspinose, lateral angles and at its apex is strongly emarginate.

*Allotype* (female).—The allotype in color and maculations very closely resembles the type. The flagellum below is not so light, the metanotum is wholly black, the fasciae on the tergites are narrow and all, except that on the fourth tergite, are interrupted medially; that on the fifth is reduced to widely separated lateral spots. Lateral spots are borne only by sternites 2 and 3. The maculations on the legs are somewhat better developed than on the type and the tarsi show the same markings borne by the type.

The anterior metatarsus bears only five spines. The inner eye margins are only very slightly divergent at the clypeus. The lateral parts of the second sternite are closely covered with relatively fine punctures; toward the mid line the punctures are fewer and coarser; while on the mid line there is a narrow longitudinal area devoid of punctures. The abdomen shows a beautiful purplish iridescence.

Length, 21 mm. Described from a male and female collected by R. C. McGregor at Puerto Princessa, Palawan, P. I., September 15, 1925.

*Type* (male).—Cat. No. 40838, U.S.N.M.

**BEMBIX PUGILLATRIX Handlirsch**

*Bembex pugillatrix* HANDLIRSCH, Sitz. Akad. Wissensch, Wien, Math.-Nat. Cl., vol. 102, 1893, p. 780.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 511.

I have before me eight males and three females that I have referred to this species. The males, with respect to the antenna, the middle femur, the second and sixth sternites, the seventh tergite, and the genital stipites, agree with Handlirsch's description of the species. The maculations, however, can hardly be termed yellow; they are more nearly white with a faint yellowish or creamy tinge. While the different specimens show some variation in the extent of the maculations, this variation is no greater than that which Handlirsch points out in his description.

Of the three females that I have referred to this species the maculations are decidedly yellow, but on the tergites they are less extensively developed than on the males. On two of the females the

fasciae on the tergites are greatly narrowed and that on the first tergite is almost suppressed. Owing to this narrowing of the fasciae, the black discal spots in the fasciae are reduced to emarginations, of which those on tergites 2 and 3 are lost or are connected with the posterior black border of the tergite, while those on tergite 4 are connected with the anterior black border. One of these two females bears the label, "Nord-Celebes, Tali-Tali XI-XII, 95, H. Fruhstorfer V.," and the other the label, "Sula Mangoli, Oct.-Novbr., Doherty ex coll. H. Fruhstorfer."

Two of the males also show this suppression of the fasciae on the tergites but not to such an extent as the two females. One of these two males bears the label, "Niat, Bingham," and the other, the same as the first of the two females.

On the third female the fasciae are better developed and the discal black spots are inclosed. This specimen bears the label, "Davao, Mindanao, Baker," and two of the males also bear this same label. Three of the remaining males bear the label, "Insel Obi, Rolle V." The eighth male bears the label, "Culasi Panay, P. I., June, 1918, McGregor."

Handlirsch reports this species from Celebes, Luzon, Mindanao, Batjan, Halmahera, Amboina, and Neuginea.

#### BEMBIX PERSIMILIS Turner

Figures 156-158

*Bembex persimilis* TURNER, Mem. Dep't. Agr. Ind., Ent. Ser., vol. 5, 1917, p. 179.

Turner described this species from two males from Akalgarh, Punjab, India. I have before me a single male and seven females from Deesa, India. Turner does not mention the form of the eighth sternite of the male, which in this genus usually ends in a single-pointed spine. The eighth sternite of the male before me ends in a bifurcate or two-pointed spine. Below I am giving a detailed description of this species, based on the material before me. I am also giving figures of the prominent characters of the male.

*Male*.—Black: labrum; mandibles, except tips; clypeus; frons to the level of the anterior ocellar cicatrice, except a pair of broad black spots; scape almost wholly; posterior orbits, very broad below, not meeting across the vertex; prothorax except a pair of small anterior dorsal spots; broken U-shaped spot and broad lateral lines on scutum; narrow fascia on posterior border of scutellum, enlarged at the ends; narrow fascia on posterior border of metanotum; broad crescent-shaped fascia on dorsum of propodeum, extended on its posterior surface in a pair of points; lateral angles and sides of propodeum; metapleura and mesopleura; broad fasciae continuous on all tergites, first with a deep bilobed anterior median emargina-



tion, second, third, and fourth each with a pair of dorsal anterior emarginations; sternites 1-5; pair of broad longitudinal spots on sixth; the legs, except a black spot on each trochanter, black stripe on posterior side of intermediate and anterior femora, a black stripe on posterior side of anterior tibiae and four black spots on anterior metatarsus; *bright yellow*.

The flagellum is testaceous in color, darker above than below and lacks evident pits or spines. The apical segment is slightly curved and abruptly pointed at the apex. The anterior metatarsus is dilated and flattened and bears on its posterior border four black lobes. It also bears on its posterior border a comb composed of numerous thickly set, evenly developed dark spines. The intermediate tibia, at its anterior apical extremity, is drawn out into a spine-like process which bears a short spine. The intermediate femur is dentate and the metatarsus on its posterior border near the apex bears a comb of several short stout spines. The second sternite bears a prominent, laterally compressed median process and the sixth, a small, narrow, pointed tubercle. The eighth sternite ends in a flattened median spine that is distinctly bifurcate at the apex. The basal half of the clypeus on the mid line is slightly carinate and on either side is plainly depressed.

*Female*.—Black: labrum; mandibles, except tips; clypeus; frons to level of anterior ocellus, except a pair of black spots; broad posterior orbits not meeting above; prothorax; legs entirely; sides of metathorax, mesothorax, and propodeum; broad U-shaped mark and lateral lines on scutum; fascia on posterior border of scutellum, from the median point of which a narrow line runs forward; broad fascia on metanotum; broad curved fascia and lateral angles of propodeum; broad continuous fasciae on tergites 1-6, first with deep bilobed median anterior emargination, 2-5 each with a pair of dorsal anterior emarginations, and sixth with a pair of small widely separated anterior emarginations; sternites 1-5 wholly, except a median anterior black spot on 3-5; pair of lateral spots on sixth; *yellow*.

The scape of the antenna is entirely yellow. The first two segments of the flagellum are yellow below and dark above. The rest of the flagellum is testaceous, being lighter below than above.

The wings on both sexes are hyaline. The pubescence is short and sparse, that on the clypeus giving it a silvery sheen. The form of the clypeus in the female is the same as that on the male. There is some variation in the maculations on the several females. On all of them the basal half of the clypeus is of a brighter yellow than the apical half. On one specimen there is a pair of small black spots on the base of the clypeus. On a second the yellow is more extensive than on others; the posterior orbits are united at the vertex and the

emarginations on tergites one and two are reduced to paired black spots. In general the variations in the maculations are variations in extent rather than variations in pattern.

Length 14 mm. The specimens are all from Deesa, India.

**BEMBIX TENEBROSA, new species**

*Type (male).*—Black: clypeus; frons, except a pair of black spots above insertion of antennae and a third black spot above anterior ocellus; antennae; prothorax; tegula; lateral spots on scutum above tegulae; apex of tergites 5, 6, and 7; sixth sternite; femora except basal ends; tibiae; and tarsi, except apical segment; *dark ferruginous*. The flagellum is much lighter in color than is the scape. The base of the mandible and the labrum is soiled greenish yellow. The terminal segment of the anterior tarsus and the apex of the terminal segment of middle and posterior tarsi are black.

On the under side of the anterior tibia near the apical end is a rather large shallow depression on the proximal border of which is a prominent black spot and at the distal border of which there is a second black spot within which there is a conspicuous pit. On the under side of the anterior femur near the proximal end is a short but evident carina. The anterior metatarsus is provided with eight spines. The posterior border of the middle femur is compressed and wedgelike, especially near the base, but it is neither serrate nor dentate. The middle tibia is curved and the middle metatarsus on its inner side near the proximal end bears a small but evident protuberance. Segments 7, 8, and 9 of the flagellum are spinose, and 10, 11, and 12 are deeply excavated. The second sternite bears a well-developed, sharp-pointed, median process and the sixth a prominent, triangular, bluntly pointed process that extends slightly beyond the apical border of the sternite. The seventh sternite bears a pair of prominent, slightly divergent carinae that do not extend to the apical border of the sternite, which is broadly truncate at the apex. The seventh tergite is narrowed and roundly pointed at the apex. The eighth sternite ends in a long, slender spine that is curved downward near the middle at almost right angles to the axis of the segment.

The *allotype* (female) is quite similar to the type in the character of its maculations. The ferruginous color, however, is somewhat lighter in shade and the black on the clypeus, the black spots on the frons above the antennae, and the black on the apical segments of the tarsi are all lacking. A pair of obscure ferruginous lateral spots is found on each of the tergites 4 and 5 and the apex of 6 is also ferruginous. The sixth sternite is carinate medially and the disk of sternite 2 is smooth and shining and bears only a few scattered, coarses punctures. The anterior metatarsus bears only seven spines.

The wings of the male are slightly and uniformly infumated while those of the female have the apical third clear and the basal two-thirds heavily infumated. On one of the two female paratypes the lateral spots on the tergites are lacking and on the other much reduced and on both the ferruginous on the terminal segment is much reduced.

Length 23 mm. Described from one male and three females bearing the label, "D. Ost-Afrika, Stuhlmann S."

*Type*.—In the Zoologisches Museum der Universitat.

#### BEMBIX DORIAE Magretti

*Bembex doriae* MAGRETTI, Ann. Mus. Genov., vol. 21, 1884, p. 590.—HANDLERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 891.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 504.

There is in the collection of the United States National Museum a single male of this species determined by Magretti. The basal half of the wings is heavily infumated, the apical part clear. The antenna, with the exception of the last three segments of the flagellum, is ferruginous, and segments 7-9 of the flagellum are spinulose beneath. The maculations of head, thorax, propodeum, and legs are ferruginous with a show of yellow on the labrum and mandibles, and on the tibiae and tarsi, especially on the hind pair. The clypeus shows a marked silvery pubescence. Maculations on the thorax are reduced to a narrow line on the pronotum, spot on side of prothorax, tubercles in part, and small lateral spots on scutum above base of wings. On the propodeum the only maculations are spots on the posterior lateral angles. The fasciae on tergites 1-5 are yellow and very broad. The first is abruptly narrowed and interrupted at the middorsal line; the second incloses a pair of narrow transverse discal spots; and the third, fourth, and fifth cover practically the entire surface of their respective tergites. The visible surface of tergites 6 and 7 are ferruginous. All sternites are ferruginous with 2-5 bearing small lateral yellow spots.

The middle metatarsus on its lower surface at the middle bears a prominent, longitudinally compressed, thin dilation. The second and sixth sternites bear prominent processes. The specimen was taken at Keren, Eritrea, February 27, 1900.

#### BEMBIX FUSCIPENNIS Lepeletier

*Bembex fuscipennis* LEPELETIER, Hist. Nat. Ins. Hym., vol. 3, 1845, p. 271.—HANDLERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 850.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 497.

The male of this species, with regard to structural characters, stands close to *doriae* Magretti. It differs from that species in having the fasciae on the tergites pale instead of yellow, and in



having the ferruginous limited to a central spot on sternite 2 and sternite 6, instead of having all the sternites ferruginous. The female resembles the female of *diversipennis*, but is much smaller and has a greater part of the frons black. The clypeus on the female before me is entirely ferruginous.

The female before me bears the label, "D. O. Afrika, Tabora, 7.08, Wintgens S. G." The single male at hand bears the label "Bulawayo, S. Rhodesia, 13-4-1924, R. H. R. Stevenson." Handlirsch reports this species from Cape of Good Hope, Port Natal, and Transvaal.

**BEMBIX STEVENSONI, new species**

Figures 196-200

*Type* (male).—Black: labrum; mandibles, except tips; sides of clypeus; posterior orbits; narrow line on posterior dorsal border of pronotum; narrow line on posterior margin of side of prothorax, including posterior margin of tubercle; small obscure spot at lateral angle on side of propodeum; large lateral spots on first tergite narrowed to a point toward middorsal line; continuous fasciae on tergites 2-5, that on second bearing a pair of long narrow dorsal spots not completely inclosed but continuous with the anterior black border, those on 3-5 bisinuate on anterior dorsal margin; lateral spots on sternites 2-5; femora in part; tibiae, except line below on all; and tarsi; *yellow*.

The greater part of clypeus; anterior orbits; transverse series of spots on frons below anterior ocellus; pair of spots above antennae connected with orbits; spot between insertions of antennae; scape; flagellum, except three apical segments; small lateral spot on scutum above base of wings; narrow obscure lateral spots on scutellum; apical border of fifth tergite; fascia on sixth; apical portion of seventh; large central area on second sternite; broad transverse band on sternites 3-5 extending between lateral yellow spots; almost the whole of sternite 6; *ferruginous*.

Segments 7-9 of the flagellum are slightly but plainly spinose and segments 10-12 are entirely black, while, with the exception of 9, which is black in part, the remaining segments of the flagellum and the scape are a light ferruginous color. The middle femora are smooth. The spur on the middle tibia is short, broad, and thumblike. The middle metatarsus bears on its inner (lower) surface a relatively large swelling or protuberance. The second sternite bears a prominently laterally compressed, pointed process, and the sixth a prominent, flattened process whose apical margin is broadly rounded. The seventh sternite is narrowed toward the apex, which is roundly truncated and on its ventral surface it bears a pair of

short prominent lateral carinae. The seventh tergite is deeply sinuate laterally, narrowed and truncated at the apex.

The *allotype* (female) differs but slightly from the type with respect to its maculations; the lateral spots on the scutellum are continued by narrow lines that almost meet at middorsal line; there is a broken line on the metanotum; there is a narrow fascia on the propodeum and the spot on its lateral angle is larger; the fasciae on the first tergite is continuous but narrowed dorsally; that on the second incloses a pair of black spots; the apex of the fifth tergite is ferruginous and the sixth is wholly so. The antenna is ferruginous, but the scape, the first segment of the flagellum and the base of the second are black above. The apex of the flagellum is darker than the rest of it, but the contrast is not so great as on the type. The sixth sternite is ferruginous and carinate on the midline. The disk of the second is smooth and bears on either side the midline numerous coarse punctures. The sixth tergite is triangular in outline, rounded at the apex and bears, except along its median part, numerous, short, stout spinelike hairs.

The wings in this species are lightly but uniformly infumated, the infumation being somewhat more pronounced in the female than in the male. The pubescence is of normal character. The clypeus is strongly arched and only slightly carinate at base. The frons between the antennae likewise is only weakly carinate. The anterior metatarsus is provided with six spines. On both type and allotype the ferruginous bands between the lateral yellow spots on the sternites inclose more or less black that may take the form of a narrow transverse line. Of the paratypes (females) two have the fascia on the first tergite interrupted and the base of the clypeus strongly bordered with black, and one of the two has both the metanotum and propodeum without maculations. On both, the fascia on the second tergite has a pair of deep anterior emarginations instead of the inclosed black spots found on the allotype. A third has the markings on the thorax and propodeum white. On this specimen the antennae are almost like those of the type in color.

The type of this species was received in an exchange and had been identified as *Bembex capensis* Lepeletier by R. H. R. Stevenson, for whom the species is named. The original description of *B. capensis* Lepeletier states that the antenna is black, whereas in this species the scape and the first eight segments of the flagellum are ferruginous. Furthermore, in this species neither the clypeus nor the labrum is marked at all with black and the process on the sixth sternite, instead of being small and subacute, is prominent, broad, and rounded at the apex. It is further distinguished from *capensis* by the infumated wings.

Length 14–17 mm. Described from one male and four females (including type and allotype). The type was collected by R. H. R. Stevenson at Bulawayo, South Rhodesia, and the allotype bears the label "D. O. Afrika, Tabora, 7. 08, Wintgens S. G." The paratypes bear a common label, "Victoria-Nyansa, I. Ukerewe, Conrads S. G."

*Type* (male).—Cat. No. 40839, U.S.N.M.

*Allotype and paratypes*.—In the Zoologisches Museum der Universität, Berlin.

**BEMBIX REFUSCATA**, new species

Figures 169–171

*Type* (male).—Black: labrum; clypeus; scape; frons, except two narrow vertical lines connected by a third line across the frons; broad anterior orbits; posterior orbits; *pale*, suffused in many places with ferruginous. Greater part of prothorax; tegulae; short line on scutum above tegula; legs, except basal segments; seventh tergite; apical border of sixth and to a slight extent that of the fifth; *ferruginous*. Lateral angles of propodeum; widely interrupted fasciae on tergites 1–5; *yellow*.

The flagella are missing and the tarsi are broken on all legs except one of the posterior pair. The anterior femur below bears a broad pale stripe separating the black at the proximal end and extending almost to the apex of the segment; and each anterior coxa bears a large, pale spot. The middle femur is smooth; the middle tibia is slightly curved; and the middle metatarsus, on its inner side, near the proximal end, bears a small but quite evident swelling or protuberance. The apex of the terminal segment of the posterior tarsus is black. The second sternite bears a small sharp-pointed process and the sixth a prominent bluntly pointed process, whose apex extends beyond the apical border of the sternite and whose sides are ferruginous in color. The seventh bears a pair of prominent lateral basal carinae. The seventh tergite is triangular in outline, truncate at apex, and slightly carinate on dorsal midline.

The *allotype* (female) very closely resembles the type in color and the character of the maculations. It differs in that only the labrum and clypeus are pale: that the frons, except for an area above the anterior ocellus, is wholly ferruginous; that the lateral angles of the propodeum are not maculated; and that the maculations of tergites 1–5 are pale with a tinge of ferruginous instead of yellow. The flagella are very light ferruginous. The sixth tergite is darkly ferruginous, slightly sinuate on the sides, broadly rounded at the apex, and covered almost to the apex with short, stout, spine-like hairs. The disk of second sternite is shining and bears numerous punctures.



The wings of this species are slightly infumated. The inner eye-margins are somewhat divergent at the clypeus. The frons between the antennae is strongly carinate and the carina is continued on the basal part of the clypeus. The pubescence is short and inconspicuous. The lateral margins of the propodeum are similar to those of *recurva*.

I have assigned to this species a male bearing the label "Victoria-Nyansa, I. Ukerewe. Conrads S. G." The genitalia of this specimen had been removed before the insect reached me. Segments 8 and 9 of the flagellum are spinose, and 10, 11, and 12 are excavated below. The eleventh is broad and the twelfth is narrowed toward the apex and somewhat curved. In other structural characters this specimen agrees with the type and it also agrees in having the pale line below on the anterior femur and the pale spots on anterior coxae. It differs in that the maculations on the tergites are pale instead of yellow; that the fascia on tergite 3 is continuous and those on 2, 4, and 5 are only narrowly interrupted; and that 2 incloses a pair of black spots.

Length 22 mm. Described from three specimens from eastern Africa. The type bears the label, "D. O. Afrika, Kamoga, Fr. Müller S." Allotype bears the label, "D. O. Afrika Mkatta I-VI '09, Schönheit S. G."

*Type*.—In the Zoologisches Museum der Universität, Berlin.

#### BEMBIX INSULARIS (Dahlbom)

*Monedula insularis* DAHLBOM, Hym. Eur., vol. 1, 1845, p. 186.—CRESSON, Proc. Ent. Soc. Phila., vol. 4, 1865, p. 143.

*Bembex insularis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 826.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 506.

Dahlbom's description of *Monedula insularis* is not complete enough or detailed enough to enable one to determine just what species he had before him, but Handlirsch, in his description of this species, states that he had, among the specimens he examined, two of Dahlbom's types. That being the case, there can be no doubt of the identity of the species. Cresson's description was beyond doubt based upon a species of *Bembex*, and a comparison of his description with that given by Handlirsch convinces me that the two authors were dealing with one and the same species.

In the collection of the United States National Museum are two males from Jamaica that I have referred to this species. On these males the sixth sternite, in addition to the median process, bears a pair of evident lateral processes, a character that neither Handlirsch nor Cresson mentions. This character is present also on the males of *infumata* Handlirsch, *nubilipennis* Cresson, and *hamata* C. L. Fox.

Handlirsch's specimens and likewise Cresson's came from Cuba, while Dahlbom's were from the Islands of St. Thomas and St. Bartholomew. I have also before me a male and female of this species taken by C. C. Gowley on the island of Jamaica.

**BEMBIX SINUATA Latreille**

*Bembex sinuata* LATREILLE, Gen. Crust. and Ins., vol. 4, 1809, p. 98.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 744.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 514.

The male of this species, although resembling the male of *bidentata* in general appearance, is well marked and distinct. The seventh tergite lacks the lateral spines found on *bidentata* and is broadly and bluntly rounded. The seventh segment of the flagellum is strongly and transversely excavated below, and segments 9-12 are also excavated but not transversely. The clypeus is strongly prominent and flattened on the ventral part, forming a V-shaped ventral area. The anterior metatarsus bears seven spines and a prominent median carina below. The posterior border of the middle femur is flattened, somewhat curved, and distinctly dentate. The spur on the middle tibia is dilated, spoon-shaped. The second sternite is tuberculate, the sixth plain, and the seventh bears a prominent, blunt tubercle whose ventral border is flattened.

The female is characterized by the many spinelike hairs on the sixth tergite. These are also present on the apical border of the fifth. The clypeus bears a median black spot. The fasciae on the tergites are continuous and the sixth tergite has the apical half maculated.

I have at hand two males and two females of this species determined by Mercet. The four specimens bear a common label, "Los Molinos [Spain] G. Mercet." The species seems to be limited in distribution to those regions bordering on the western part of the Mediterranean Sea.

**BEMBIX ARCUATA Parker**

Figures 217, 220

*Bembix arcuata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 81.

In this species the ocelli, though much distorted, are not completely obliterated; lenses are visible. The male, in common with the male of *U-scripta* Fox, has the scape much thickened, the labrum with a small hump on the midline, the anterior metatarsus with 10 spines, the middle tibia with the anterior apical border produced into a spinelike process, the middle metatarsus concave and beset with spines on the inner side, and the seventh tergite with apical lateral ridges and with distinct but not sharply defined basal lateral angles.

Both species have the middle femora dentate below, the second and sixth sternites without processes, and the seventh sternite with a pair of widely separated carinae that diverge basally. The male genitalia of this species differ widely from that of *U-scripta*. The two species also differ in the character of their maculations.

## SPECIMENS EXAMINED

KANSAS.

NEW MEXICO: Mesilla (June 26, 1897, Cockerell).

TEXAS: Cotulla (May 11, 1906, J. C. Crawford).

## BEMBIX U-SCRIPTA Fox

## Figure 218

*Bembex U-scripta* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 362.

*Bembix U-scripta* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 83.

In the collection of the United States National Museum there is a single specimen of this species, a male, bearing the designation "Type," but by whom so marked I do not know. It bears the label "Tucson, Arizona, Coll. Ashmead," and since Fox based his description of the species in part on material collected at Tucson by Ashmead it is quite probable that this is a male from the group on which Fox based his description. Fox also had some material from California, and I have identified specimens of this species from New Mexico. It is closely related to the preceding species (*Bembix arcuata* Parker), with which it agrees in its most prominent structural characters, as set forth in the discussion of that species.

## BEMBIX VELOX Handlirsch

*Bembex velox* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 819.

Handlirsch described this species from a single male from Zanzibar, Africa. I have before me one male and six females that I have, after considerable hesitation, referred to this species. With respect to the character of the antennae, the middle femora, the processes on the second and sixth sternites, and the genitalia, this male agrees with the description and figures given by Handlirsch for *Bembix velox*. It differs from the description of that species, however, in having the wings clear and in having a pair of minute black spots on the clypeus. The form of the seventh tergite differs slightly from that shown in Handlirsch's figure of the seventh tergite of *velox*. Since Handlirsch had but a single individual from which to write his description, the variations within the species were unknown to him, and it seems to me that the differences noted above are well within the limits of variation possible within a species.

The females in general form and appearance resemble very closely the male with which I have associated them. They differ



from the male in the following respects: The frons, except a small round spot on either side the anterior ocellus, is entirely black; the clypeus, except the ventral-lateral areas, is also black; and the labrum, except a narrow longitudinal, lateral stripe on either side, is likewise black. The fasciae on the tergites are similar to those on the male, except that the first fascia is continuous on some specimens and more or less widely interrupted on others, and the second fascia bears inclosed discal marks instead of anterior emarginations. On two of the females there is a pair of transverse discal marks on the extreme posterior border of the scutum; on all there are maculations on the posterior dorsal surface of the propodeum; and on some the metanotum is also maculated. The wings are only slightly infumated.

The male bears the label, "D. O. Afrika, Forst St. Msalla, 15. IV. Brandenburg S. V." The females bear a common label, "Victoria-Nyansa, I. Ukerewe, Conrads S. G."

#### BEMBIX CINEREA Handlirsch

*Bembex cinerea* HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 102, 1893, p. 837.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 503.

*Bembix cinerea* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 84.

This species seems to occur only in those States bordering the eastern and southern coasts of the United States. The species is relatively small and is sparingly maculated. The male has the lateral areas of the clypeus black. The specimens on which Handlirsch based his description of the species were from Georgia.

#### SPECIMENS EXAMINED

FLORIDA.

GEORGIA.

NEW JERSEY: Cape May (July, 1890).

TEXAS.

#### BEMBIX HINEI Parker

*Bembix hinei* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 86.

This species is very closely related to *cinerea* Handlirsch, from which it may be distinguished by the fact that in this species the tarsi are invariably yellow, whereas in *cinerea* the tarsi are wholly or in part black, never wholly yellow. The mandibles on *cinerea* are black, whereas on this species they are largely yellow. On the male of this species the clypeus is wholly yellow and the genital stipes is quite different from that of *cinerea*. This species is larger than *cinerea* and its maculations are better developed.

#### SPECIMENS EXAMINED

LOUISIANA.

TEXAS: Brownsville; Galveston (May, F. H. Snow); Ladre Island (June 29, 1895).

**BEMBIX ALACRIS, new species**

Figures 87-89

*Type* (male).—Black: mandibles, except tips; pair of small spots below anterior ocellus; narrow posterior orbits; narrow line on posterior border of pronotum uniting small lateral spots; spot on side of prothorax extending to posterior border of tubercle; lateral spot on scutum at base of wings; narrow fascia on posterior border of scutellum; narrow, broken fascia on metanotum; pair of spots on posterior surface of propodeum; lateral angle of propodeum; spot on side of propodeum; spot on metapleura; fascia on first tergite, narrowed and interrupted at dorsal midline; broad fascia on second, inclosing a pair of dorsal elliptical spots and narrowed at dorsal midline; broad fascia on tergites 3, 4, and 5, biemarginate on anterior border and sinuate at midline on posterior border; fascia on sixth tergite; lateral spots on sternites 2-5; femora in part; tibiae, except below on all; and tarsi, except lower surface of anterior pair: *yellow*.

The wings are hyaline: the antennae are black, the scape being very thick and heavy. Of the flagellum, segments 6, 7, 8, and to a slight extent 9, are spinose, and segments 9, 10, and 11 are excavated below. The ultimate segment is strongly curved, flattened and pointed at the apex, which is very light in color. The middle femora are dentate, the teeth, five in number, being limited to the apical half of the femur. The second sternite bears a well-developed median carina and the sixth, a conspicuous median swelling which can not be properly called a tubercle or process. The frons between the antennae is carinate and the eye-margins are approximately parallel. The anterior metatarsus is provided with six spines, which are white in color. The seventh tergite is abruptly narrowed toward the apex, which is roundly pointed (fig. 88). The seventh sternite is much narrowed at the apex and is not distinctly carinate.

This species stands close to *B. melanopa* Handlirsch, from which it may be distinguished by the different form of the seventh tergite, by the lack of a process on the sixth sternite, by the white spines on the anterior metatarsus, and the different form of the genital stipes.

Length 17 mm. Described from a single specimen bearing the label, "Somali, Salakle, 7-6-01, B. V. Exlauger."

*Type* (male).—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX ALDABRA, new species**

Figures 83, 84

*Type* (male).—Black: labrum; mandibles, except tips; clypeus; area between antennae; pair of spots on frons below anterior ocellus; scape below; broad anterior orbits deflected away from the eye-margins above and extended to the vertex; posterior orbits narrowed

above; narrow posterior border of pronotum; sides of prothorax, except large spot in front of tubercles; broad lateral lines and broken U-shaped discal mark on scutum; narrow fascia on posterior border of scutellum widened at its extremities; fascia on metanotum; narrow fascia on propodeum, widened and interrupted on its posterior surface; large spot on lateral angle and side of propodeum; spot on metapleura; narrow spot on mesopleura; fasciae on all tergites continuous; that on first tergite broad laterally, narrower dorsally and deeply notched at midline on anterior border; that on second tergite inclosing pair of dorsal black spots and also notched at midline on anterior border; remaining fasciae more or less deeply biemarginate on anterior border; small lateral spots on sternites 2-4; femora in part; tibiae, except spot below on all and spot above on anterior pair; and tarsi; *yellow*.

The flagellum is black above, testaceous below; the seventh segment is slightly spinose on its posterior median border and the eighth and ninth segments are very slightly spinose at the posterior apical border. Segments 9-11 are somewhat excavated below and the terminal segment is slightly curved and light in color at the apex. The frons between the antennae is carinate, as is also the base of the clypeus. The anterior metatarsus bears six spines. The inner margins of the eyes are approximately parallel. The middle femur on the distal half of its posterior border is dentate, the teeth being quite small. The second sternite is carinate on the midline, with the posterior end of the carina taking the form of a weakly developed tubercle. The sixth sternite bears a distinct tubercle that is not at all pointed. The seventh sternite bears a prominent, median, longitudinal carina, and the seventh tergite is distinctly, though not deeply, emarginate at the apex. The wings are hyaline and the pubescence normal.

With respect to the maculations, there is little variation between the type and the eight paratypes. With respect to the development of the processes on the second and sixth sternites, however, there is considerable variation, and in the preparation of my key to the males of this genus I have endeavored to avoid confusion due to this variation by inserting this species in the key in two places.

In the collection of the United States National Museum, taken by the same collector at the same place as the males assigned to this species, and presumably at the same time, is a single female that may be the female of this species, but in the character of its maculations it differs so widely from the males that, in the absence of any data other than that just stated above, I do not feel justified in assuming that it is the female of this species. The antennae are black; the frons, clypeus, and labrum are almost wholly black, and maculations on the scutum, scutellum, and propodeum (except on the lateral angles) are entirely lacking.



Length 15 mm. Described from nine males (including the type) that bear a common label, "Aldabra I., Indian O., W. L. Abbott."

*Type*.—Cat. No. 40840, U. S. N. M.

**BEMBIX TREPANDA** Dahlbom

Figures 207–209

*Bembex trepanda* DAHLBOM. Hym. Eur., vol. 1, 1845, p. 181.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 736.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 515.

The male of this species is characterized by the almost angular dilation of the posterior border of the anterior femur, by the serrate middle femur, and by the lateral lobes and apical emargination of the seventh tergite. Segments 7 and 8 of the flagellum are distinctly spinose, segments 9–11 are dilated and excavated below, and segment 12 is strongly curved. The genitalia are shown in Figure 209. In both sexes the anterior metatarsus bears seven spines, and the second abscissa of the cubitella is lacking. The wings of the female are relatively shorter than is normal in this genus.

The specimens of this species in the United States National Museum are all from Deesa, India. Handlirsch reports this species from Mauritius and Ceylon; Cameron reports it from Barrackpore, Bombay, and Gilgit.

**BEMBIX ORIENTALIS** Handlirsch

Figures 153–155

*Bembex orientalis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat., Cl., vol. 102, 1893, p. 737.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 510.

This species stands very close to *Bembix trepanda*, from which species the male may be distinguished by the absence of an apical emargination on the seventh tergite, by the fact that segments 7 and 8 of the flagellum are not distinctly spinose below, and by the different form of the genital stipes. The female differs from the female of *trepanda* by having the sixth tergite black. A single female in the United States National Museum, received in an exchange as a female of this species, bears a pair of basal black spots on the clypeus. It bears the label, "Sikhim, Coll. Bingham." The two males that I have referred to this species are from Deesa, India.

**BEMBIX SECULATA**, new species

Figures 190–192

*Type* (male).—Black: labrum; mandibles, except tips; clypeus; broad anterior orbits deflected inward on vertex to join broad posterior orbits; frons below anterior ocellus, save pair of widely sep-

arated black spots; scape, save black spot apically above; prothorax; prominent U-shaped discal mark and broad lateral lines on scutum; broad fascia on scutellum with short anterior extension at midline; metanotum; propodeum almost entirely; metapleura; mesopleura, except a minute round spot; broad continuous fasciae on tergites 1-6, first, second, and third each bearing a pair of dorsal spots, fourth and fifth biemarginate on anterior border; sternites 1 and 2; sternite 3, except small median anterior spot; fasciae on 4 and 5 each with a prominent median and pair of smaller lateral anterior emarginations; narrow interrupted apical fascia on sternite 6; legs, except posterior line on all femora; *yellow*.

The flagellum is testaceous below, darker above, and segments 6, 7, and 8 are spinose on posterior border. The apical segment is strongly curved and sharply pointed, giving the segment a sickle-shaped outline. The intermediate femora are serrato-dentate. The second sternite bears an evident median carina and the sixth bears a slight median process, which terminates near the apex of the segment and from which a transverse ridge extends on either side to the margin of the sternite at a short distance from the apex. The apical part of the seventh sternite bears a median carina and is pointed at the apex. The seventh tergite bears distinct lateral lobes (fig. 191), in this respect resembling *trepanda* and *orientalis*.

*Allotype*.—Black: labrum; mandibles, except tips; clypeus, except a pair of small basal black spots; anterior orbits deflected inward at the vertex to join the posterior orbits; frons below anterior ocellus, except a pair of large black spots; prothorax; broad U-shaped mark and broad lateral lines on scutum; very broad fascia on scutellum with short median anterior prolongation; metanotum; propodeum almost entirely; metapleura; mesopleura; broad fasciae on tergites 1-5, each emarginate at midline posteriorly, first, second, and third each inclosing a pair of dorsal spots, fourth and fifth biemarginate on anterior border; sternite 2, except large median spot; fascia on sternite 3 with deep anterior median emargination; fascia on 4 with large median and pair of smaller lateral emarginations; fascia on 5 reduced almost to lateral spots; minute lateral spots on 6; legs, except black line on posterior surface of all femora and trace of black on posterior surface of hind tibiae; *yellow or yellowish white*.

The pubescence is short, white, and normal in development. On the clypeus of the female it imparts a silvery sheen. The flagellum of the female is darker than that of the male, its apical segment is curved slightly but is not so sharply pointed as is that of the male. The wings are hyaline. Basally the clypeus is carinate on midline and somewhat depressed on either side. On all specimens there is a pair of small black spots on the mesosternum.

Length 15 mm. Described from three males and two females from Deesa, India.

*Type, allotype, and paratypes.*—Cat. No. 40841, U.S.N.M.

**BEMBIX BELFRAGEI** Cresson

*Bembex belfragei* CRESSON, Trans. Amer. Ent. Soc., vol. 4, 1873, p. 220.

*Bembex cressonis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 793.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 503.

*Bembex insignis* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 793.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 506.

*Bembex belfragei* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 92.

The reasons for the synonymy given above were set forth in my previous paper on the Bembicine wasps and need not be repeated here. This species is well marked and is not likely to be confused with any other species thus far described from North America.

SPECIMENS EXAMINED

TEXAS: Cotulla (May 5, 1905, W. D. Pierce).

WISCONSIN: North Hudson, St. Croix County (July 7-12, 1910).

This species has been reported also from Georgia, Kansas, and Louisiana.

**BEMBIX RUGOSA** Parker

Figures 215, 216

*Bembix rugosa* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 95.

This species, which is known only from the type (a female) in the United States National Museum, may be readily recognized by its unusually long, narrow labrum and its rugose sixth tergite. When this species was described I raised the question of the possibility that this may be the female of *Bembix stenebdoma* Parker, not so much because of the resemblance of the two sexes as because of the resemblance of the male and female, respectively, to the male and female of *Bembix belfragei* Cresson. But until more evidence is available I do not think it proper to associate the two as sexes of one species. The type bears simply the label "Ariz."

**BEMBIX INTEGR** Panzer

*Bembex integra* PANZER, Faun. Ins. Germ., vol. 8, 1805, p. 84.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 701.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 506.

The male of this species, with respect to the dilation of segments 2-4 of the anterior tarsus and of the middle metatarsus, resembles *zonata*, but on this species the dilation of the anterior tarsus is marked with black, which is not the case on *zonata*. The middle femur on this species has the posterior border distinctly curved and strongly dentate, whereas on *zonata* it is straight and not dentate.



In addition the process on the sixth sternite is strongly developed into a median tubercle on this species and the maculations on the sternites consist of only lateral spots.

The female may be distinguished from *zonata* by the presence of only lateral spots on the sternites instead of broad fasciae, and by the lack of conspicuous maculations on the thorax and propodeum.

This species is distributed over central and southern Europe. I have before me three males and seven females, of which one male and two females were determined by Mercet. This male bears the label, "Granja, G. Mercet," and the two females bear the label, "Los Molinos [Spain], G. Mercet." One of the other males is labeled "Germany," and the second is labeled "Austria." Of the five remaining females, three bear the label, "Austria"; a fourth, the label, "Valley of Ordena, Pyrenees (Seitz) 1400-1700 m.,"; and the fifth is without a locality label.

#### BEMBIX AMOENA Handlirsch

*Bembex amocna* HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 102, 1893, p. 769.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 502.

*Bembix amoena* PARKER, Proc. U. S. Nat. Mus., vol 52, 1917, p. 88.

This species is very closely related to *B. sayi* Cresson. With respect to the males, the only character upon which I can rely to separate the two species is the length of the apical spur on the middle tibia, which on *amoena* is always relatively longer than on *sayi*. Although there is some variation in the length of this spur on each species, it is, in the case of *amoena*, approximately equal to or greater than half the length of the middle metatarsus, whereas on *sayi* it is always less, and usually very much less, than half the length of the middle metatarsus. This difference in length of the tibial spur of the middle leg holds for the females of the two species also, but the difference in the maculations of the dorsum of the thorax and propodeum of the females of the two species is more constant and therefore more reliable than are any differences in maculations on the males.

#### SPECIMENS EXAMINED

CALIFORNIA: Yosemite (July 20, 1905, J. McFarland).

NORTH DAKOTA: (C. N. Ainslie).

UTAH: Beaver Creek Hills, Beaver County; Silver Lake (July 14, H. Skinner).

WASHINGTON: Govan (August 6, 1911, Hyslop); Medical Lake (July 15, 1920, M. C. Lane); Soap Lake, Grand Coulee (June 29, 1902).

WYOMING: Butte (August 27, 1896, R. P. Currie); Yellowstone Park (July 17, 1907, W. Robinson; August 4, H. Skinner).

Handlirsch reports this species also from Colorado, Illinois, Nevada, and British Columbia.

## BEMBIX SAYI Cresson

*Bembex sayi* CRESSON, Proc. Ent. Soc. Phila., vol. 4, 1865, p. 467.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 877.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 513.

*Bembix sayi* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 90.

Cresson based his description of this species upon two females from Colorado, which differed from one another in size and also to some extent in their maculation. He says that on one specimen there were obscure dusky areas on the anterior apical corners of the clypeus, but he failed to state on which of the two specimens these dusky areas occurred. On both of these specimens the sixth tergite was entirely black. Handlirsch based his description of this species on a single female from Illinois and this specimen had the sixth tergite maculated. Fox described a male from Illinois that he considered the male of this species. It was this male that I made the type of *Bembix fovi* Parker, whose description appeared in my preceding paper on this group.<sup>6</sup> In the collection of the United States National Museum are females from Colorado that answer perfectly to Cresson's description of the larger of his two specimens upon which the species was based, and in the collection are also males from Colorado that so closely resemble these females as to warrant the assumption that they are males of this species. On all these specimens, both males and females, the fasciae on the tergites are very light, almost white. In the collection, with the sixth tergite conspicuously maculated, are other females that I have referred to this species, some of which are similar in color to those light forms mentioned above and some are of rich golden yellow. It is possible that I am including here specimens of more than one species, but the limited material at hand and the absence of males to associate with these extensively maculated females does not permit a splitting of this group into distinct species.

## SPECIMENS EXAMINED

COLORADO: Alamoza (August 6, 1903, Dyar and Caudell); Boulder (August 5, 1908, S. A. Rohwer); Cope (August 9, 1905, S. A. Johnson); Golden.

FLORIDA: St. Augustine (Cockerell).

KANSAS: (SNOW).

NEW MEXICO: High Rolls (June 14, 1902).

TEXAS: Aguilares (April 21, 1906, J. D. Mitchell).

## BEMBIX FUMIDA, new species

Figures 102, 103

*Type* (male).—Black: labrum; clypeus, except a bilobed basal spot; scape below; mere traces of posterior orbits; lines on femora,

<sup>6</sup> Proc. U. S. Nat. Mus., vol. 52, 1917, p. 96.

tibiae, and tarsi of first pair of legs; spot at end of femur of second and third pairs of legs; *pale or soiled yellow*. Aside from these few maculations the body of the insect is a uniform smoky black in color. The tarsi are not so black as the body proper.

The inner eye-margins are parallel. The flagellum of one antenna and the last three segments of the other are missing. Segments 7-9 of the remaining imperfect antenna are spinulose. The middle femur is dentate. The second sternite bears a small, compressed, pointed process, and sternite 6, a prominent, low, broad process whose posterior, free border approaches a semicircle in outline; there is also on sternite 6 a pair of small lateral processes on the extreme posterior lateral angles of the sternite. The seventh tergite is abruptly narrowed toward the apex, which is roundly truncate (fig. 103). The wings are slightly infumated, the infumation being heavier at the middle of the wing than at the apex. The second abscissa of both the radiella and the cubitella is present. The pubescence is short, dense, and gray in character.

Length 15 mm. Described from a single male from Japan.

*Type*.—In the Zoologisches Museum der Universität, Berlin.

#### BEMBIX OCULATA Latreille

*Bembex oculata* LATREILLE, Hist. Nat. Crust. and Ins., vol. 13, 1805, p. 302.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 102, 1893, p. 854.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 509.

According to Handlirsch, this is a widely distributed and an exceedingly variable species and because of this great variation, due to the extent and the color of the maculations and to the presence or absence of infumation in the wings, he recognized eight different forms under which this species occurs. All the specimens before me belong to what he termed the Southwest-European form.

I have before me four males and five females, of which two females and two males have been determined by Mercet. Of these four the two males and the one female bear the label, "Madrid, G. Mercet," and the second female, the label, "Los Molinos, G. Mercet." Of the remainder one male and one female bear the label, "J. Lichtenstein, Montpellier, France"; one female bears the label, "Sardinia, A. H. Krausse"; and the other male and female are without locality labels.

#### BEMBIX NIGROCORNUA, new species

Figures 141-144

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except a narrow basal border; a transverse row of spots on frons below level of anterior ocellus; narrow posterior orbits; prothorax,



except spot in front of tubercle; U-shaped discal mark and lateral lines on scutum; fascia on posterior border of scutellum; narrow fascia on posterior border of metanotum; curved fascia on dorsum of propodeum; lateral angles of same; large triangular spot on mesopleura; spot on metapleura; fasciae on tergites 1-5 all continuous except the fifth; first and second each inclosing a pair of dorsal black spots; third and fourth each having a pair of anterior emarginations; lateral spots on sternites 1-5; pair of conspicuous spots on anterior coxae; femora, save a stripe above and a spot below on each; tibiae, save for a narrow stripe below on each; and tarsi; *bright yellow*.

The antenna is entirely black. Segments 6 and 7 of the flagellum are slightly spinose on posterior border; 10 and 11 are excavated and when seen from above are decidedly broader than the apical segment, which is curved and roundly truncate at the apex. The intermediate femora are dentate. The second sternite bears a small, median, sharp-pointed process. The sixth bears a flattened, broadly triangular, bluntly pointed median process and a pair of small, pointed lateral processes. The seventh sternite is narrowed posteriorly and is squarely truncate at the apex. The seventh tergite is coarsely punctate and its posterior border is slightly notched or sinuate on either side the midline.

*Allotype*.—Black: labrum; mandibles, except tips; apical half of the clypeus divided by a median dark line; spots below anterior ocellus; posterior orbits; prothorax; U-shaped mark and lateral lines on scutum; fascia on posterior border of scutellum enlarged at the ends; fascia on posterior border of metanotum; prominent fascia on dorsum and posterior surface of propodeum; lateral angles and sides of propodeum; metapleura; broad triangular spot on mesopleura; broad continuous fasciae on tergites 1-4, the first bearing a pair of round anterior emarginations that are almost inclosed, second and third each inclosing a pair of dorsal spots, fourth biemarginate on anterior border; pair of large lateral spots on fifth tergite; lateral spots on sternites 2-5; pair of conspicuous spots on anterior coxae; femora, save for a line on each above and below; tibiae, save line on each below; and tarsi; *bright yellow*.

The antenna is wholly black. The sixth sternite is slightly carinate along the midline and the punctures on either side this median area are much coarser at the apex of the sternite than at the base. The sixth tergite is roundly pointed at the apex and is thickly and coarsely punctate, except along a narrow median line. The lateral borders of the tergite bear numerous short, stiff spines.

In this species the wings of the male are hyaline, those of the female slightly and uniformly infumated. The pubescence is short

and white, conspicuous on head and propodeum, less so on the side of the thorax. The variation in maculations is not great. The black on the base of the clypeus is always more extensive on the female than on the male, and on some females it is more extensive than on others. On most of the males the anterior orbits are represented only by a pair of spots in line with those below the anterior ocellus, but on others they are more or less well developed. On some males the scape is yellow below. The maculations on the males from Deesa vary from pale yellow to pale creamy white and the fasciae on the tergites show both shades of color. The males from Burma, however, do not show this variation. On the females this variation is much less evident. On two of the males from Deesa the process on the second sternite is much better developed than on the type; in fact, it presents a large well-developed tubercle. On these two specimens and on one other the second sternite is marked by a well-developed posterior yellow fascia. On one female the fifth tergite bears a continuous fascia and on two the fascia on the first tergite is interrupted.

Length 15 mm. Described from 9 males and 13 females, of which 4 males and 9 females, including the type and allotype, are from Deesa, India; 5 males and 3 females from Tavoy, Burma; and 1 female from Sikhim. This last and those from Tavoy were collected by Bingham.

*Type*.—Cat. No. 40842, U.S.N.M.

**BEMBIX MISERABILIS, new species**

Figures 138-140

*Type* (male).—Black: labrum; mandibles, except tips; clypeus; scape below; broken line on middle of frons; broad anterior orbits shortened above; posterior orbits; posterior border of pronotum connected with spot on side; tubercles in part; short, narrow line on scutum above base of wing; fascia on posterior border of scutellum; fascia on metanotum; curved fascia or dorsum of propodeum extended on its posterior surface; lateral angles and small spot on side of propodeum; three spots on mesopleura; broad continuous fasciae on all tergites, the first much narrowed medially, the others bi-marginate on anterior border, the posterior ones only slightly so; lateral spots joined by apical lines on sternites 2-6; medial spot on sternites 2-4; legs, with exception of black spot on coxae and trochanters and black line on posterior surface of anterior femora; *yellow*.

The flagellum is broadened apically and the last five segments are roundly spinose on posterior border (fig. 140), and are excavated below. The intermediate femora are distinctly dentate. The second sternite bears a small, median, compressed process and the sixth a small, pointed process. The seventh sternite, which is relatively

broad and is slightly emarginate at the apex, also bears a median well-developed process, such as is usually found on the sixth in other species. The eighth terminates in a comparatively broad, flattened, bluntly-pointed spine, differing thus from most species in which the eighth terminates in a rounded acutely-pointed spine. The seventh tergite is abruptly narrowed and rather sharply-pointed apically (fig. 139).

*Allotype*.—The female so closely resembles the male in color and markings as to render a separate description unnecessary. On the dorsal areas and the sides the maculations are somewhat better developed than on the male, but on the sternites they are more reduced. The black on the legs is more extensive, lines being present on the posterior surfaces of all tibiae and femora and on the anterior surface of the posterior femora.

The wings in this species are hyaline and the pubescence normal. The color of the maculations as seen on the specimens is a soiled muddy yellow, but I am certain that these specimens have been damaged so that they do not represent the true color of the living insect.

Length 20 mm. Described from one male and one female from Japan.

*Type*.—In collection of Cornell University.

**BEMBIX HAMATA C. L. Fox**

Figures 110-112

*Bembix hamata* C. L. Fox, Psyche, vol. 30, 1923, p. 6.

This species is closely related to *Bembix nubilipennis* Cresson. Like that species, it has the middle femora irregularly dentate, segments 7 and 8 of the flagellum prominently spinose, and sternite 6 with small, though evident, lateral processes in addition to the median process. It differs from *nubilipennis* in the form of the genital stipes and in the character of the maculations. On this species the thorax and propodeum are entirely black, while on *nubilipennis* the prothorax is more or less profusely marked with yellow. The pubescence is much more conspicuous than on *nubilipennis*.

This species was described from males taken at San Miguel Island, Calif.

**BEMBIX NUBILIPENNIS Cresson**

*Bembix nubilipennis* CRESSON, Trans. Amer. Ent. Soc., vol. 4, 1872, p. 218.—

HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 102, 1893, p. 838.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 509.

*Bembix nubilipennis* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 87.

The female of this species has the base and the apex of the wings clear, but the middle portion heavily infumated, while the wings of



the male are but slightly infumated or, in the majority of specimens, entirely clear. The male may be distinguished from other North American species, except *insularis*, *infumata* and *hamata*, by the presence of lateral processes on the sixth sternite. From *insularis* it may be distinguished by the character of the genital stipes and by the fact that the fasciae on the tergites of *insularis* are white, whereas on this species they are yellow. The female of this species is not likely to be confused with any other North American species except *melanaspis*, which is distinguished from it by having more or less black on the clypeus, whereas *nubilipennis* has the clypeus wholly yellow.

## SPECIMENS EXAMINED

COLORADO: Walsenburg.

ILLINOIS: Jacksonville (July, 1900, Crain).

IOWA: Fairfield (T. C. Ross).

KANSAS: Wilson (August, 1909, J. B. Parker).

MEXICO: Lerdo, Durango (June 10, 1918).

NEBRASKA: Grand Island (July 5, 1897).

NEW MEXICO: Koehler (W. H. Walton).

OKLAHOMA: Durant (June, 1905, F. C. Bishopp).

TENNESSEE.

TEXAS: Bryant; Childress (September 1, 1908, E. S. Tucker); Corsicana (May 16, 1907, R. A. Cushman); Marfa (June 6, 1908, Mitchell and Cushman); Paris (A. L. Melander); Plano (July 14, 1907, E. S. Tucker); Wichita Falls (June 10, 1906, J. D. Mitchell).

## BEMBIX MERCETI, new name

• Figures 129-133

*Bembex handlirschi* MERCET, Bol. R. Soc. esp. Hist. nat., 1904, p. 343 (not Cameron, Fauna and Geography of Maldive and Laccadive Archipelago, vol. 1, Pt. 1, 1901, p. 57).

There are in the United States National Museum a male and a female of this species identified by Mercet and received from him in an exchange. The male of this species is well marked. The anterior tibia at its distal end is somewhat dilated; the middle tibia is distinctly curved, the concave surface being on the outer side, and its anterior distal border at the apex is produced into a spinelike process that subtends a short spine; the distal end of the middle metatarsus is distinctly flattened; the posterior border of the middle femur is dentate. Both second and sixth sternites bear processes and the seventh sternite bears prominent lateral carinae and a broad median longitudinal area resembling somewhat a process. The seventh tergite is broadly rounded at the apex and bears a short, median, apical, dorsal depression. At the posterior lateral angles of

this tergite lateral ridges are developed, below which the angles are broadly rounded and directed ventrally.

The female resembles the male in color but the ultimate tergite is greatly narrowed and provided with short lateral ridges near the apex, which is almost squarely truncate. On both male and female the inner eye-margins are divergent at the clypeus, and the anterior metatarsus is provided with 10 spines, of which the three proximal ones are smaller than the others. These specimens bear the label, "Madrid, G. Mercet."

**BEMBIX REGNATA, new species**

Figures 179-183

*Type* (male).—Black: labrum; clypeus, except a pair of small basal spots; mandibles, except tips; scape; space between and above antennae; transverse line below anterior ocellus; broad anterior orbits shortened above; broad posterior orbits much narrowed above; prothorax, except a series of dorsal spots; lateral line above base of wings and a pair of short narrow discal lines on scutum; narrow fascia on posterior border of scutellum; narrow fascia on metanotum; curved fascia on dorsum of propodeum extended downward on its posterior surface; lateral angles and sides of propodeum; metapleura; mesopleura and mesosternum almost wholly; interrupted fascia on first tergite much narrowed toward the midline; continuous fasciae on tergites 2-6, very broadly emarginate on anterior dorsal border; lateral spots on sternites 2-5; legs, except line above on femora of first and third pairs and small spots near the junction of femur and tibia of all pairs; *yellow*, the fasciae on the tergites being pale rather than bright yellow.

The flagellum is dark above, lighter below and toward the apex. Its segments are neither spinose nor excavated but segments 10 and 11 are flattened. The apical segment is slightly curved and roundly truncate at the apex. The middle femora are dentate, being provided with a number of widely separated spinelike teeth. The middle tibia has its anterior apical border prolonged into a curved toothlike process which bears at its apex a short spine. Near its middle this tibia also shows a slight enlargement or swelling below. The second sternite bears a prominent, blunt, keel-shaped process and the sixth a flattened triangular elevation from the apex of which a slight carina extends to the apex of the sternite. The seventh tergite is narrowed and broadly rounded at the apex and covered with numerous coarse punctures. The eighth sternite ends in a short, thin, flat, blunt spine. The genitalia (fig. 182) are distinct.

*Allotype* (female).—Black: labrum; mandibles, except tips; clypeus, except pair of small basal marks; frons between antennae; elliptical spot below anterior ocellus; anterior orbits narrowed and shortened above; scape, except small apical spot above; posterior orbits narrowed and interrupted above; posterior border of prothorax including tubercles; lateral lines and U-shaped discal mark on scutum; narrow fascia on posterior border of scutellum; fascia on metanotum; curved fascia on propodeum; small spot on mesopleura; interrupted fascia on first tergite greatly narrowed at midline; continuous fasciae on tergites 2-5, deeply and roundly biemarginate on anterior dorsal border and acutely emarginate at midline on posterior border; sixth tergite; small lateral spots on sternites 2-4; apex of femora in part; tibiae, except line below; and tarsi; *yellow*. The labrum, clypeus, scape, and anterior orbits are pale rather than yellow.

The flagellum is ferruginous with the first and second segments black above.

The frons in this species is distinctly carinate and the carina is continued on the base of the clypeus. The wings are remarkably short and hyaline, though the abundance of short hairs upon the surface causes them to appear slightly infumated. The second intercubitus is only slightly bent on both sexes, but is less so on the female than on the male. The pubescence is very short and inconspicuous. The anterior metatarsus is provided with seven spines. The second sternite of the female is shining and thickly set with coarse punctures. The sixth tergite, except near the apex, which is triangular and roundly pointed, is covered with long, fine hair, among which laterally are a number of stout, spinelike hairs. The inner eye-margins are almost parallel, being only very slightly divergent at the clypeus.

Length about 20 mm. Described from two specimens from eastern Africa. The type bears the label, "D. O. Afrika, Usaramo, Rufiji Klurtusteppe, X—XI, Gotze S." The allotype bears the label, "Njassa See, Langenburg, 20—25, V. 99, Dr. Fütteborn S."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX SPATULATA, new species**

Figures 193-195

*Type* (male).—Black: labrum; mandibles, except tips; clypeus; scape below; frons to level of anterior ocellus, except central black spot; posterior orbits; prothorax almost entirely; broken U-shaped discal mark and short lateral lines at base of wings on scutum; narrow fascia on posterior border of scutellum enlarged at ends; narrow fascia on metanotum; narrow curved fascia, interrupted medially on



dorsum of propodeum; metapleura; mesopleura, except small rounded black spot; continuous faciae on tergites 1-6, first narrowed medially, second, third, and fourth biemarginate dorsally; apex of seventh tergite; sternites 1-3 entirely; broad fascia on each of fourth and fifth emarginate medially; the legs, except for black spots on posterior surface of trochanters and lines on posterior surfaces of femora and tibiae and apical dark spots on the underside of all tarsal segments; *very pale yellow or white*.

The flagellum is dark above, testaceous below and its sixth, seventh, and eighth segments are slightly spinose. The apical segment is slightly curved, narrowed, and rounded at the apex. The intermediate femora are dentate and the anterior border of the intermediate tibia at the apex is drawn out into a spinelike process that bears a prominent spine. The second sternite bears a prominent, laterally compressed process and the sixth a small triangular process. The seventh sternite is broad, squarely truncate at the apex and spatulate in form. It bears a median V-shaped carina and a pair of lesser lateral carinae.

*Allotype*.—Black: labrum; mandibles, except tips; clypeus; scape below; frons to level of anterior ocellus, save a pair of black spots; posterior orbits broad below; prothorax, save anterior part of pronotum; broken U-shaped discal mark and lateral lines above base of wings on scutum; fascia on posterior border of scutellum enlarged at the ends; fascia on metanotum; curved fascia on dorsum and posterior surface of propodeum; sides of same; metapleura; mesopleura; broad continuous faciae on tergites 1-5, first narrowed medially, second inclosing a pair of dorsal black spots, third, fourth, and fifth, each biemarginate on anterior dorsal margin; apex of sixth tergite; sternites 1-4; broad fascia on fifth; pair of minute apical spots on sixth; legs except for black lines on all trochanters, femora, and tibiae; *yellow or very pale yellow*.

The pubescence on this species is white, short, and sparse, save on the head and propodeum. On abdominal segments 6 and 7 of the male it is more evident than is usually the case. The maculations on the male vary somewhat. On some specimens the U-shaped discal mark is reduced to a pair of lines and on others it is entirely lacking. The tergal faciae usually show two colors, yellow on the anterior border and white on the posterior, with the white occupying the greater portion of the fascia. The form of the genital stipes (fig. 194) and the seventh sternite of the male render this species easy to identify.

Length 13-15 mm. Described from 13 males and 1 female from Quetta, India.

*Type, allotype, and paratypes*.—Cat. No. 40843, U.S.N.M.

## BEMBIX ROSTRATA Linnaeus

Figures 187-189

*Apis rostrata* LINNAEUS, Oelandska och Gothlandska Resa, 1745, p. 246.

*Bembex rostrata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 764.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 512.

According to Handlirsch, this species is one of the most numerous and most widely distributed of the palearctic group, being distributed from the Mediterranean to Scandinavia and from Portugal to Mongolia. The male is strongly characterized by the dentate middle femur, the deeply excavated and dilated last three segments of the flagellum, the tuberculate second and sixth sternites, and the strong carina of the seventh sternite, which, at the apex of the segment, terminates in a two-pointed process. Of the five males before me these structural characters are constant but variation in the maculations is great. On one specimen the fasciae on the tergites are broad and all except the first are continuous; on another they are narrow and all are interrupted at the midline. One male bears the label, "Europe"; two bear the label, "Germany"; the fourth bears the label, "Aranjuez, G. Mercet"; and the fifth bears the label, "Gray." A single female before me, which bears the label, "Los Molinos, G. Mercet," has the fasciae on the tergites creamy white instead of yellow as on the males.

## BEMBIX PICTICOLLIS Morawitz

Figures 159-161

*Bembex picticollis* MORAWITZ, Horae soc. Ent. Ross., vol. 23, 1889, p. 144.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 767.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 511.

This species is closely related to *Bembix rostrata* Linnaeus. With regard to the form and structure of the antennae, middle femora, and the genitalia, the two species are almost identical and their resemblance in the color and character of their maculations is quite close. The form of the seventh sternite on the two species is quite different: On *rostrata* this sternite bears a distinct, median, longitudinal carina that is bifurcate at the apex, whereas the carina on this sternite on *picticollis* is simple and does not reach the apex of the sternite. The form of the spine on the eighth sternite is also different: On *rostrata* the spine is long, curved, and pointed in the normal fashion, whereas on *picticollis*, although it is sharply pointed, it is short, straight, and broadly flattened. The form of the seventh tergite is also different as is shown by Figures 161 and 189.

This species is represented in the United States National Museum by three males, each bearing the label, "Uen Chuen Szechuen, China, Aug. 3-6, 1924, D. C. Graham, Coll., altitude 4,500-5,500 feet."

**BEMBIX MEGERLEI** Dahlbom

*Bembex megerlei* DAHLBOM, Hym. Europ., vol. 1, 1845, p. 492.—HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 729.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 508.

Of this species I have at hand one male and two females, each bearing the label, "Austria." The male of this species may readily be distinguished by the characters found on the middle femur and metatarsus: The femur is dentate below with the middle tooth, the longest one in the row and the metatarsus below at its middle point bears two stout spines and the distal part beyond the spines is slightly curved. The second and sixth sternites bear moderately developed tubercles and the seventh a broad, median carina. The dorsal border of the clypeus is black and from the center the black is extended to form a large median spot. The mesothorax, metathorax, and propodeum are wholly black and the maculations on the abdomen are confined to narrow lateral spots on tergites 1-3.

On the females the fasciae on the tergites are pale, relatively broad, and all continuous on one specimen and all but the fourth continuous on the other. On both specimens the fifth tergite bears only a pair of small round discal spots and the sixth an apical spot. On one there is a narrow, interrupted fascia on the scutellum, traces of an interrupted fascia on the metanotum, pair of large spots on posterior part of the propodeum, a very large spot on the side of the propodeum and another on the metapleura. The side of the prothorax on this specimen is almost entirely pale. On the other female these same maculations are present but are greatly reduced, especially on the scutellum, metanotum, and dorsum of propodeum. On the sternites, maculations are limited on both females to lateral spots on two and three and to extreme tip of six. On both males and females the second abscissa of the cubitella is lacking.

**BEMBIX MELANOPA** Handlirsch

*Bembex melanopa* HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Mat.-Nat. Cl., vol. 102, 1893, p. 797.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 508.

I have at hand two males and two females that I have referred to this species, and also two males determined by R. H. R. Stevenson. The peculiar form of the genital stipes, the form of the terminal segment of the antenna, the position of the teeth on the posterior border of the middle femur, together with the black antennae and



black face, form a combination of characters that readily distinguishes the male of this species. The female is more difficult to separate from related forms; its black face and black antenna (except tip of flagellum), the interrupted fascia on the fifth tergite, and the reduced or obsolete second abscissa of the cubitella vein are its most conspicuous characters. Four of the specimens bear the following labels: "Nyassa-See, Langenburg, III. 98, Fülleborn S"; "Nyassa-See, Langenburg, 20.VIII.-1.IX.98, Fülleborn S"; "Kap Kolonie"; and "D. Ost-Afrika, Stuhlmann S." The two males determined by Stevenson bear the labels: "Sawmills, S. Rhodesia, 22-27, Dec., 1923, R. H. R. Stevenson"; and "Bulawayo, 13, 9, 1923, R. Stevenson."

**BEMBIX FORCIPATA** Handlirsch

Figures 97-99

*Bembex forcipata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 798.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 505.

This species differs from *melanopa* apparently only in the extent of the maculations. The clypeus is largely yellow, the labrum wholly so, and the sides of the thorax are more or less conspicuously maculated. I have before me three males and one female that I have referred to this species. They bear the following labels: "Dar es Salaam, Aug.-Sept., 1902, Meinhof S."; "D. Ostafrika, mikindani, IV-V, 1911, H. Grote S. G."; "D. Ost-Afrika, Stuhlmann S."; and "D. O. Afrika, Hinter Waldungen von Dar-es-Salaam, Schulze V."

**BEMBIX FRIOENSIS**, new species

Figures 100, 101

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except pair of black spots; lower part of frons, continued upward on midline to join spot below anterior ocellus; small round spot on either side this large spot; anterior orbits, deflected inward opposite anterior ocellus; scape below; posterior orbits narrowed above; prothorax, except pair of anterior dorsal spots and dusky spot in front of tubercles; broad lateral lines on scutum; pair of broad discal lines and an interrupted transverse posterior line, forming a broken U-shaped discal mark on scutum; fascia on posterior border of scutellum narrowed at midline; fascia on metanotum; curved fascia on propodeum, interrupted at midline on posterior surface; posterior-lateral angles and sides of propodeum; metapleura; mesopleura, fasciae on tergites 1-6, all interrupted at midline, first narrowed medially, second and third each inclosing pair of black discal spots,

fourth, and fifth biemarginate on anterior dorsal border; pair of spots on apex of seventh tergite; second sternite, except pair of anterior black spots and large medial longitudinal black spot; lateral spots on sternites 3-5 joined by narrow apical lines; coxae and trochanters for the most part; femora, except line above on anterior pair and basal spots on all; tibiae, except small basal spot on all and small spot below on anterior pair; and tarsi; *yellow*.

The posterior border of the middle femur on its apical half is weakly dentate, the teeth being small, short, and blunt. The flagellum is black and is neither spinose nor excavated, but segments 5-11 show specialized areas below and the apex of the terminal segment is rufous. The second sternite bears a median, sharp-pointed, prominent process, and the sixth, a short, broad and bluntly pointed process that is slightly concave on its ventral surface. The seventh sternite bears a median carina and at the base a pair of inconspicuous lateral carinae. The genital stipes is distinct in form and bears a conspicuous yellow maculation.

The *allotype* (female) in color differs but little from the type; the scutellum bears lateral spots instead of a fascia; only the fascia on the second tergite incloses black spots; and the lateral spots on the sternites are somewhat less extensive. The sixth tergite at its apex bears a pair of yellow spots. The sixth sternite on the mid-longitudinal line is destitute of punctures, but laterally at the base it is densely and finely punctate, while at the apex the punctures are very coarse. As on the type, the flagellum is black with the apex of the terminal segment rufous.

The wings of this species are hyaline and the pubescence white in color and normal in development. The frons between the antennae is but slightly carinate, and the clypeus is only moderately arched. Among the paratypes is a female, from the same locality as the type, that has the sixth tergite black, the anterior orbits interrupted, and, together with a second female from the same locality, has the black spots on the clypeus joined. Two male paratypes from Piura, Peru, have the maculations in general much better developed. On these specimens the black on the clypeus is lacking, the fasciae on tergites two and three inclose black discal spots, and those on tergites one and six are continuous. These two agree with the type in having the genital stipes maculated.

Length 16 mm. Described from three males and ten females. Of these the type, allotype, and five female paratypes bear the label, "Rio Frio, Colombia, March 1924, H. W. Atkinson, Collector." The two male paratypes bear the label, "Piura, Peru, fls. Asclepiad Vine, April 28, 1911 (Townsend)." Of the remaining females two bear

the label, "Chauchaumayo, Peru, from W. F. H. Rosenberg," and two bear the label, "Tabernilla, Canal Zone, Panama, IV, 1911, A. H. Jennings, Coll."

*Type*.—Cat. No. 40844, U.S.N.M.

**BEMBIX OCHRACEA Handlirsch**

Figures 146-148

*Bembix ochracea* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 864.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 509.

The single male specimen that I have doubtfully referred to this species agrees in most respects with Handlirsch's description. It differs in having no fascia on the propodeum; in having a pair of obscure yellow spots on the seventh tergite; and in having on the sternites well-developed fasciae, of which that on the second sternite is quite broad and those on the other sternites are broad laterally but are narrowed conspicuously at the midline. These differences in the extent of the maculations are well within the limits of variation found in species of this genus. Handlirsch's type lacked complete antennae. Segments 7-11 of the flagellum of this specimen are excavated below and segments 7-9 are spinose. Segment 11 is somewhat dilated and the terminal segment is short, strongly curved and roundly truncate at the apex. The form of the seventh tergite is shown in Figure 148 and the form of the genitalia in Figure 147. The specimen, which is the property of the Zoologisches Museum der Universitate, Berlin, bears the label "Cap Myers" and the number 21616.

**BEMBIX FESTIVA, new species**

Figures 91-93

*Type* (male).—Black: labrum; clypeus; mandibles, except tips; scape below; area on frons between antennae ending in a point above; spot below anterior ocellus; broad but short anterior orbits; posterior orbits; posterior border of pronotum joined with tubercles; sides of prothorax, except long irregular spot in front of tubercles; small lateral spot on scutum above base of wings; small lateral spots on scutellum; broad fasciae on tergites 1-7, first narrowly interrupted at midline, second inclosing pair of narrow discal spots and narrowed somewhat at midline, third biemarginate on anterior dorsal border and sinuate at midline on posterior border, fourth emarginate at midline on posterior border, seventh biemarginate laterally on anterior border; lateral spots on sternites 2-6 and median spots on 2-4, of which those on 2 and 3 are joined to the corresponding lateral



spots by apical lines; femora, except more or less of the proximal half; tibiae; and tarsi; *yellow*.

The wings are hyaline. The pubescence is white, rather short, and dense. It is very short, but unusually conspicuous on all segments of the abdomen. The flagellum is black above, light yellowish below, and segments 5–9 are spinose below. Segments 10 and 11 are slightly excavated below. The posterior border of the middle femur is dentate except near the proximal end. The second sternite bears a prominent, median, laterally compressed process that ends in a short, curved sharp point. The sixth sternite bears a prominent, narrowed, median, bluntly pointed process whose ventral surface is grooved. The seventh sternite bears a median longitudinal carina that reaches the posterior end of the sternite and assumes almost the proportions of a process. The anterior metatarsus bears six spines.

In general appearance this species resembles *nubilipennis* but may readily be distinguished from that species by the absence of lateral processes on the sixth sternite. It also resembles somewhat the male of *connexa* but differs from that species in having the propodeum, metanotum, metapleura, and mesopleura wholly black.

Length 18 mm. Described from a single male bearing the label, "Oak Creek Canon, Ariz., 6,000 feet, July, F. H. Snow."

*Type*.—In the collection of the University of Kansas.

#### BEMBIX MUSCICAPA Handlirsch

*Bembex muscicapa* HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 102, 1893, p. 828.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 509.

*Bembex sayi* FOX, Proc. Acad. Nat. Sci. Phila., 1895, p. 359.

*Bembex foxi* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 96.

This species is conspicuous for the distribution of its maculations. The sides of the thorax and propodeum are profusely maculated and the scutum bears more or less well-developed discal and lateral lines, but the scutellum, metanotum, and dorsum of the propodeum are, in the male, entirely black and in the female only the scutellum bears lateral spots. On some females there are yellow spots on the posterior surface of the propodeum. The male is also distinguished by the large, long, curved, sharp-pointed process on the second sternite. The fascia on the first tergite on both sexes is always narrower than the others and is always more or less widely interrupted, but any of the other fasciae may be weakly connected or all may be interrupted. The third, fourth, and fifth are most frequently connected at the midline.

In the collection of the United States National Museum there are eight males and eight females of this species, all from Porto Rico.

The specimens on which I based my description of *B. fovi*, according to the labels they bear, were from Illinois. Is it possible that the placing of the labels upon these specimens is the result of a mistake?

BEMBIX NIPONICA Smith

Figure 145

*Bembex niponica* SMITH, Trans. Ent. Soc. London, 1873, p. 194.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 509.

In the collection of the United States National Museum is a single male that has been determined as this species, but by whom the determination was made is unknown. I have compared the specimen with the original description of the species and am convinced that the determination is correct. The specimen bears the label, "Sapporo Agr. Coll., Dec., '96, Japan, M. Matsumura."

The following is a detailed description of this male: Black: clypeus; labrum; mandibles, except tips; anterior orbits shortened above; area below antennae and space between them extended upward; scape below (flagella broken off); posterior orbits narrowed above; irregular band on posterior border of pronotum and posterior border of tubercles connected by a large irregular spot on side of prothorax; short narrow lateral lines on scutum above base of wings; fascia on posterior border of scutellum; fascia on metanotum; narrow, curved fascia on propodeum, interrupted at midline on its posterior surface; small spot on posterior lateral angles of propodeum; small spot on mesopleura below wings; broad, continuous fasciae on tergites 1-6, that on second tergite inclosing pair of black discal spots; apex of seventh tergite; lateral spots and median spot on sternite 2 connected by an apical line; lateral spots and median spot on sternite 3; lateral spots on sternites 4 and 5 connected by very narrow apical lines; large lateral spots on 6; lateral spots on 7; coxae and trochanters in part; femora, except black line on posterior surface of first pair and basal black spot on anterior surface of third pair; tibiae; and tarsi; *pale grayish yellow*.

The middle femora are distinctly dentate. The middle tibia is angulate below, giving rise almost to a longitudinal carina. The wings are hyaline and the second abscissa of both radiella and cubitella is present. The second sternite bears a well-developed median process; the sixth bears a small one and the seventh also bears a process as well developed as that on the sixth. The seventh tergite laterally is slightly sinuate, and is abruptly narrowed toward the apex, which is squarely truncate. The spine of the eighth sternite is short and broad, in form resembling somewhat a spearhead.

Length 20 mm.

## BEMBIX FLAVESCENS Smith

*Bembex flavescens* SMITH, Cat. Hym. Ins. Brit. Mus., vol. 4, 1856, p. 321.—  
HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 862.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 504.

Of this species I have before me two specimens, a male and a female, received by the United States National Museum in an exchange, but by whom they were determined is not shown. They agree quite closely with Handlirsch's description of the species. The male differs from Smith's description of the male only in the absence of discal lines on the scutum. They bear a common label, "Gomera (Canar. Ins.), Hintz V. 15. IV. 98." This species has been reported only from the Canary Islands.

## BEMBIX CONNEXA Fox

*Bembex connexus* FOX, Proc. Acad. Nat. Sci. Phila., 1895, p. 360.  
*Bembix connexa* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 115.

In the collection of the United States National Museum are six females that I have referred to this species. They are large and robust with the maculations bright greenish yellow. In this respect they differ from Fox's type, on which the fasciae on the tergites are whitish. They agree with the type, however, in having the sides of the thorax and propodeum extensively maculated, while having the scutum, scutellum, metanotum, and dorsum of propodeum either entirely black or with only minute lateral spots on the scutum and scutellum. The male is known only by the single specimen on which Fox based his description of the male of the species. The yellow color of this male is similar to that of *occidentalis*. The middle femur is strongly dentate below; segments 7-10 of the flagellum are slightly, though evidently, spinose, segments 7 and 8 being more prominently so; the processes on sternites 2 and 6 are well developed and pointed; and there are evident rounded lateral ridges on the basal half of the sixth sternite, but they do not constitute lateral processes. The maculations on the dorsum of the thorax and propodeum are somewhat more extensive than on the female.

## SPECIMENS EXAMINED

CALIFORNIA: Los Angeles County (July, Coquillett); Mariposa County (Coquillett).

NEVADA: Reno (July 26, 1889, F. H. Hillman).

UTAH: South Creek, Beaver County.

## BEMBIX LATIFRONS Parker

*Bembix latifrons* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 116.

This species is not represented at the United States National Museum. It is known only from the type (female) in the collection of the University of Kansas.



## SPECIMENS EXAMINED

NEW MEXICO: Albuquerque (1894, F. H. Snow).

**BEMBIX GRADILIS**, new species

*Type* (male).—Black: labrum; mandibles, except tips; clypeus; scape below; lower part of frons extended upward from between the antennae; broad anterior orbits shortened above; transverse series of three spots below anterior ocellus; narrow posterior orbits; narrow posterior border of pronotum continued on tubercles; spot on sides of prothorax; small lateral spot above base of wings and pair of short, narrow discal lines on scutum; lateral spots on scutellum; fascia on metanotum; short oblique lateral lines on dorsum of propodeum; spot on lateral angles of propodeum; small spot on metapleura; narrow vertical line broken into two spots on mesopleura; interrupted fasciae on tergites 1–5, all except the first more or less broadly bisinuate on anterior border; lateral spots on sternites 2–5, decreasing in size from two to five; conspicuous spot on anterior coxae; femora, except black line above on all and short line below on second and third pairs; tibiae; and tarsi; *yellow*. The lateral spots on the scutellum and fascia on metanotum are *white*.

The flagellum is black above, somewhat testaceous below, and its segments are all without modifications. The middle femora are weakly dentate below. The second sternite bears a median longitudinal carina that may be regarded as a poorly developed tubercle. The sixth sternite bears a small, short, sharp-pointed, median process and the seventh is carinate on the midline. The wings are hyaline. The pubescence is normal in development, being longest on head, thorax, and propodeum. The paratype differs from the type in lacking discal lines on the scutum and spots on the lateral angles of the propodeum, and in having the maculations on the mesothorax reduced.

This species runs in Handlirsch's table to *Bembex inops* Handlirsch and it is possible that this may be only a yellow form of that species. All maculations, except those on the scutellum and metanotum, are bright yellow and the genital stipes in form differs somewhat from the figure given by Handlirsch of the stipes of *inops*.

Length 16 mm. Described from two males (type and paratype) bearing the label, "Paso del Libres Carrientes, Argentina, January 12–14, 1920, Cornell Univ. Exped."

*Type*.—In the collection of Cornell University.

**BEMBIX SPINOLAE** Lepeletier

*Bembex spinolae* LEBELETIER, Hist. Nat., vol. 3, 1845, p. 227.

*Bembex fasciata* DAHLBOM, Hym. Eur., vol. 1, 1845, p. 487.

*Bembex spinolae* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 285.—FOX, Proc. Acad. Nat. Sci. Phila., 1895, p. 357.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 514.

*Bembix spinolae* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 98.

This is the most widely distributed species of the genus in North America. This species, *similans* Fox, *primaestate* Johnson and Rohwer, *cameroni* Rohwer, and *comata* Parker form a group of overlapping species that present considerable difficulty to the student of the taxonomy of these wasps. Typical specimens of these species can readily be distinguished from each of the other species, but it is by no means an uncommon occurrence to find specimens that may be referred to two or more of these species and can not with certainty be referred to any one of them. This state of affairs raises the question of the validity of some of these species, but it is a question that must depend for an answer upon more work in the field; it is a question that can not be answered by an examination of dried specimens stuck on pins.

*Bembix spinolae* occurs in the eastern part of the United States and Canada and has been reported in the east from Ontario to Florida and in the west from the Dakotas to Texas. With the exception of one report of *similans* from Florida, all the other species in this group are found in the mountainous western part of the country or on the west coast. I have, however, examined specimens from the western area, taken along with typical examples of *comata* and *primaestate*, that must be considered examples of *spinolae*. I have examined other specimens also from the West that could not with certainty, in the light of our present knowledge of this group, be referred to any one of these species. A short study of the nesting habits of *B. comata* Parker, which I made at San Francisco during the summer of 1925, showed that this species differs in its mode of constructing its nest from *B. spinolae* Lepeletier, whose nesting habits I have studied in the District of Columbia. I am of the opinion that further studies of this kind in the field must be made before the relationship of the species in this group and the validity of the species themselves can be satisfactorily determined.

#### BEMBIX CAMERONI Rohwer

*Bembix cameroni* ROHWER, Proc. U. S. Nat. Mus., vol. 41, 1912, p. 467.

*Bembix cameroni* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 99.

This species is somewhat more robust than *spinolae* and is also marked with maculations of much richer yellow. The males can be distinguished from the males of closely related species by the fact that the fifth segment of the flagellum is spinose. The females may be distinguished from those of related species by the broad yellow

fasciae of the tergites, the maculated sixth tergite, and the absence of maculations on the sides of the mesothorax and propodeum. From *nubilipennis* the male of this species may be distinguished by the absence of lateral processes on the sixth sternite and the female by its clear wings.

## SPECIMENS EXAMINED

ARIZONA: Oak Creek Canon (August, F. H. Snow).

MEXICO: Federal District (October 7 and 8, C. F. Baker).

NEW MEXICO: High Rolls (June 12, 1902); White Oaks (August 2, 1903).

## BEMBIX COMATA Parker

*Bembix comata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 100.

Typical forms of this species, both males and females, have the fasciae white in color and the terminal tergite maculated. The pubescence on the head, thorax, propodeum, and base of abdomen is much better developed than in the case of *spinolae*, being long, dense, and white. Recent collections by C. L. Fox indicate that this species also appears with yellow fasciae instead of white. It differs from *primaestate* in the absence of conspicuous maculations on the sides of the thorax and propodeum, but among the numbers collected by Mr. Fox are some specimens that stand on the border line between these two species, not agreeing with typical forms of either species, yet showing some characteristics of both. A brief study of the nesting habits of *comata* showed that this species in rearing its young constructs a burrow in which it provides several brood chambers, one for each egg deposited. In this respect it differs from *spinolae*, which species constructs a new burrow for each egg deposited; that is, rears only a single young in each burrow.

## SPECIMENS EXAMINED

CALIFORNIA: Claremont; Los Angeles County (Coquillett); San Francisco (July, 1925, J. B. Parker).

NEVADA: Reno (August 30, 1889, F. H. Hillman).

NEW MEXICO.

OREGON: Forest Grove (July 21, 1918, M. C. Lane); Van Sickle Canyon (September 13, 1904, E. S. G. Titus).

WASHINGTON: Kahlotus (August 18, 1920, M. C. Lane); Lake McElroy, Poha (July 20, 1920, M. C. Lane); Spokane (July 7, 1924, J. M. Aldrich); Stratford (September 3, 1920, M. C. Lane).

## BEMBIX PRIMAESTATE Johnson and Rohwer

*Bembix primaestate* JOHNSON and ROHWER. Ent. News, vol. 19, 1908, p. 378.—  
ROHWER, Proc. U. S. Nat. Mus., vol. 41, 1912, p. 466.

*Bembix primaestate* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 101.

This species seems to be intermediate between the eastern *spinolae* and the western *comata*. The females must be separated from



*spinolae* on the color and extent of the maculations, and it frequently happens that specimens are taken that can not with certainty be referred to either species by the use of any keys so far devised. Likewise many males are found that seem to be intermediate between this species and the males of *similans* Fox and thus present the same difficulties in identification. Consequently no keys, even the one I have prepared herewith, can be depended upon absolutely in making identifications among these closely related species.

## SPECIMENS EXAMINED

ALBERTA: Medicine Hat (August 20, 1916, Sladen).  
 ARIZONA: Oak Creek Canyon (F. H. Snow).  
 BRITISH COLUMBIA: Vancouver (August 9, 1916, Livingston).  
 COLORADO: Boulder (September 13, 1907, S. A. Rohwer); Denver (June 13, 1902).  
 IDAHO: Springfield (July 30, 1906, S. A. Snyder).  
 LOUISIANA: East Point (September 5, 1907, F. C. Bishopp).  
 MEXICO: Guadalajara (June 19, 1903, McClendon).  
 NEVADA: Reno (August 28, 1889, F. H. Hillman).  
 NEW MEXICO: Fort Wingate (July 15, 1909, John Woodgate); High Rolls (June 11, 1902).  
 TEXAS: Midland (June 16, 1909, F. C. Bishopp); Rosser (August 23, 1905, F. C. Bishopp); Victoria (September 11, W. A. Hooper).  
 WASHINGTON: Friday Harbor (June 19-26, 1909); Olga (July 15-31, 1909); Seattle.

## BEMBIX SIMILANS Fox

Figure 28

*Bembex similans* Fox. Proc. Acad. Nat. Sci. Phila., 1895, p. 358.

*Bembix similans* PARKER Proc. U. S. Nat. Mus., vol. 52, 1917, p. 103.

In this species both males and females have yellow maculations, in this respect resembling *cameroni*. According to Fox's description of this species, the fifth segment of the flagellum is "dentate beneath." On none of the specimens that I have referred to this species do I find this to be true. *B. cameroni* alone of this group of closely related species has the fifth segment of the flagellum spinose beneath. The maculations on the sides of the thorax and propodeum are more extensive than on any other species of this closely related group. The specimens on which Fox based his description of the species were taken at Las Cruces, N. Mex.

## SPECIMENS EXAMINED

FLORIDA: Jacksonville (April, L. O. Howard).  
 KANSAS.  
 MEXICO: San Jose de Guaymas (April 10, L. O. Howard).  
 NEW MEXICO: Mesilla Park (C. N. Ainslie); Las Cruces (August 30, Townsend).

## BEMBIX LIBERIENSIS, new species

Figures 119-122

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except a pair of large basal spots; spot on lower side of scape; posterior orbits narrowed above and not reaching the vertex; pair of small dorsal spots on posterior border of prothorax; spot on side of prothorax; small spot on lateral angle of propodeum; widely separated lateral spot on first tergite; interrupted fascia abruptly narrowed medially on second tergite; continuous fasciae on tergites three and four, biemarginate anteriorly and deeply emarginate on posterior median line; interrupted fascia on tergite 5; pair of small lateral spots on sternite 2; spots and stripes varying in size on the legs; *pale yellow*.

The flagellum is entirely black. Segments 8 and 9 are spinose and segments 7-12 show light-colored specialized areas on posterior side. The apical segment is longer than the eleventh; in fact, is almost as long as eleventh and tenth combined; it is slightly curved and roundly pointed at the apex. The legs show no special modifications. The second sternite bears a small, sharp-pointed, median process and the sixth bears a larger, bluntly pointed, median process near the apex of the sternite. The sixth also bears a pair of conspicuous, curved, lateral carinae. The seventh sternite bears a pair of lateral, parallel carinae that do not extend to the apex of the sternite.

*Allotype*.—Black: labrum, except lateral borders basally; mandibles, except tips; apical border of clypeus; trace of anterior orbits; posterior orbits; obscure spot on lower side of scape; pair of small dorsal spots on posterior border of pronotum; spot on side of prothorax; vertical line on mesopleura; lateral angle of propodeum; widely separated lateral spots on first tergite; interrupted fasciae, all narrowed medially, on tergites 2-5, the interruption being wide on the second tergite and very narrow on the fifth; small lateral spots on sternites 1-5; stripes on femora, tibiae, and tarsi of all legs; *pale soiled yellow*.

The seventh tergite on the male is triangular in outline, narrow and truncated at the apex, whereas on the female it is rounded at the apex and is finely and uniformly punctate, except toward the apex, where the punctures are coarser and more scattered. The extreme apical portion is without punctures.

Length, 23 mm. Described from one male and one female from Liberia, Africa. The two specimens are in poor condition so that the exact shade of the maculations is uncertain.

*Type and allotype*.—Cat. No. 40845, U.S.N.M.

## BEMBIX ALBATA, new species

Figures 85, 86

*Type* (male).—Black: clypeus; labrum; mandibles, except tips; spot between antennae; scape, except broad line above; broad anterior orbits shortened above; spot on tegula; short, narrow line on scutum above tegula; broad, continuous fasciae on tergites 1–6, the first with a relatively deep, rounded anterior emargination, remaining fasciae each with a broad, shallow anterior emargination whose border is weakly trisinate; seventh tergite entirely; broad, continuous fasciae on sternites 1–6; seventh entirely; femora apically, more extensive below than above; tibiae, except spot below on first and second pairs; and tarsi; *pale yellow*.

The fasciae on the tergites are exceedingly pale, almost white; those on the sternites are more yellowish, resembling the yellow of the legs. The intermediate femora are neither serrate nor dentate and the intermediate tibiae and metatarsi are normal. The anterior metatarsus is provided with six cilia or spines. The second sternite bears a median, small, thinly compressed, sharply pointed process. On the sixth there is a peculiarly swollen area, somewhat triangular in outline with the apex on the midline near the apical border of the sternite. The segments of the flagellum lack evident spines or excavations. Genital stipes as in Figure 85.

The maculations of the *allotype* (female) are identical with those of the type, except that (1) on the tubercle there is a yellow spot that is extended downward on the posterior margin of the prothorax, (2) the yellow on the legs is more extensive, there being no black present on the middle tibiae, and (3) the basal border of both the sixth tergite and sixth sternite is black.

The wings on this species are hyaline. The frons is broad and the inner eye-margins are parallel. The mandibles are slender and the teeth on the inner margin are so much reduced that the mandibles are approximately edentate. The head, thorax, first three segments of the legs, the popodeum, and the basal part of the first abdominal segment in both sexes are covered with long, dense, hoary pubescence, giving to this species a vestiture much like that possessed by some bees.

Length, 14–17 mm. Described from five males and three females, each of which bear the label "Lüderitz-Bucht, XII, 1903, L. Schultze, S."

*Type*.—In the Zoologisches Museum der Universität, Berlin.



## BEMBIX ZONATA Klug

*Bembex zonata* KLUG, Waltl: Reise d. Tirol, etc., 1835, p. 96.—HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 712.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 515.

The male of this species may be readily recognized by the unusual dilation and flattening of segments 2-4 of the anterior tarsus; by the peculiar form of the middle metatarsus, the proximal half being flattened in one plane and the distal half flattened in another plane almost at right angles to the first; by the peculiar form of the process on the sixth sternite, which extends entirely across the sternite; and by the two very prominent carinae on the seventh sternite. On both male and female the fasciae on the tergite are continuous and sternites 2-5 are wholly yellow. On the female the sixth tergite and sternite are maculated and the sides of the propodeum and thorax, as well as the mesosternum, are almost entirely yellow.

This species is found in Spain, Portugal, and southern France. I have before me a male and a female determined by Mercet. The female bears the label "Los Molinos [Spain], G. Mercet," and the male the label "Madrid [Spain], G. Mercet."

## BEMBIX FORMOSANA Bischoff

*Bembex formosana* BISCHOFF, Deutsch. Ent. Zeitschr., Heft. 7, 1923, p. 714.

Of this species I have two specimens, a male and a female, both identified by Bischoff. The male bears the label "Formosa, Takao, 26.9.07, Sauter S. V.," and the female the label "S. Formosa, Takao, 7.8.1907, H. Sauter S. V." Judging by these labels and the data given in the original description of the species, I presume these specimens are from the number which Bischoff had before him when he described the species.

## BEMBIX KRIECHBAUMERI Handlirsch

Figures 113, 114

*Bembex krieschbaumeri* HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 816.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 507.

I have before me a single male that I have referred to this species. It bears the label, "Togo, Frau Geh. Rat Döwitz G." The antenna is without spines or excavations; the posterior border of the middle femur is plain, being neither serrate nor dentate; there is a long, low, median, longitudinal carina on the second sternite; the sixth sternite lacks a true process, but there is a median, rounded elevation near the posterior end; the seventh tergite bears a prominent, median, longitudinal carina. A pair of short, narrow discal lines is present on the scutum; a fascia on posterior border of scutellum; a curved fascia on the propodeum; broad continuous fasciae on tergites 1-5, the

second including a pair of black spots; the sixth tergite bears a median spot. The pubescence is white and is well developed on the head, thorax, and propodeum. On the tergites the pubescence is fine and short on the anterior part of the abdomen, but increases in length posteriorly until on the sixth and seventh tergites it is quite long and conspicuous.

Handlirsch gives the distribution of this species as follows: "Neider-Guinea: Cap Lopez, Junk River, Gabun, Landana, Chinchoua und Vista an der Congomünding."

#### BEMBIX RAPTOR Smith

*Bembex raptor* SMITH, Cat. Hym. Brit. Mus., vol. 4, 1856, p. 326.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 901.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 511.—TURNER, Ann. Mag. Nat. Hist., ser. 8, vol. 16, 1915, p. 446.

I have before me a male and a female that, in Turner's "Key to the Australian Species of *Bembex*," run to this species. The male conforms quite closely to Smith's description of the species. The scutum bears a broken U-shaped discal mark, which shows only a trace of fuscous. The propodeum above is black. The black on the clypeus is confined to a narrow dorsal border. The antenna is without modifications. The sixth tergite is truncate at the apex and also plainly emarginate. This specimen bears the label, "Gordonvale, N. Q., J. F. Illingworth, Coll. Ex."

Of the female the prothorax, the sides of the mesothorax, metathorax, and propodeum are entirely yellow. There is a prominent U-shaped discal mark (decidedly rufous) on the scutum, prominent fascia on scutellum, metanotum, and propodeum. The fasciae on tergites 1-5 are broad, the first notched at the middle on the anterior border, the others at the middle on the posterior border, and all more or less bisinuate on the anterior border. The sixth tergite bears conspicuous lateral spots. Sternites 2-5 really bear broad fasciae, which are all but interrupted by large black spots that occupy the middle areas of the sternites. Sternite 6 bears lateral spots. The punctures on the black area of the second sternite are very large and not closely placed. The specimen bears the label, "N. W.-Australien, Carlshalton, E. Clement S. V." Turner reports this species as the most common one of central Australia.

#### BEMBIX BRULLEI Guerin

*Bembex brullei* GUERIN, Voyage de la Coquille, Zool., vol. 2, 1830, p. 253.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 835.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 503.

The male of this species, with its black thorax and propodeum, richly pubescent and with few or no maculations and with its shining

black abdomen and bright yellow fasciae confined to tergites 2-4, can scarcely be confused with any other American species. Except on the tergites, the maculations are pale. The fasciae on the tergites are usually all interrupted, but on some specimens that on the first tergite or those on the first and second are continuous. On one male there are small, yellow spots on the fifth tergite. The antenna is without structural modifications. The anterior metatarsus bears seven spines. The middle femora are smooth. The second sternite, although sometimes slightly carinate, is without a process; the sixth bears a small, median process that on some specimens is obsolete. The seventh is distinctly carinate on the midline.

The female appears under two forms: one has the fasciae on the tergites, the lateral spots on the sternites, and to a greater or less extent the legs also, bright yellow; while the other has the maculations on all parts of the body pale. With respect to the pattern of the maculations there is no essential difference between the two forms. Data derived from the specimens before me show that males and both forms of the female have been taken at the same place on the same date. The species seems to be confined to Chile.

## SPECIMENS EXAMINED

CHILE: Angol (1924, Det. Rohwer); Merimar (February, 1921); Santiago (February, 1921, A. Faz; 1923, Fr. Claude Joseph, Det. Herbst); Southern Part (M. J. Revera).

## BEMBIX PRUINOSA Fox

*Bembex pruinosa* Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 361.

*Bembix pruinosa* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 104.

This is a well-marked species, one not likely to be confused with any other species thus far described from North America. On both sexes the maculations are white and relatively broad. The smooth middle femora, the absence of processes on the second and sixth sternites, and the reduction of the seventh sternite to a spine grooved on its ventral surface form a combination of characters that distinguish the male of this species. The female is distinguished by a black basal area on the clypeus (rarely obsolete); by fasciae (sometimes broken) on scutellum, metanotum and propodeum; and by the lack of any tendency in the fascia on the second tergite to inclose a pair of black spots.

## SPECIMENS EXAMINED

CALIFORNIA: Mount Shasta District.

CANADA: (C. F. Baker).

FLORIDA.

IOWA: Dubuque (August 25, 1872); Muscatine (August 8, 1889, Witter).

KANSAS: Riley County (September, Marlatt).



LOUISIANA: East Point (October 7, 1907, F. C. Bishop).

NEW MEXICO: Albuquerque.

NEW YORK.

OHIO: Cedar Point (August, J. B. Parker).

OREGON.

TEXAS.

Fox reports this species also from Camden County, N. J.

**BEMBIX COMANTIS, new species**

Figure 222

*Male*.—Black: clypeus; labrum; base of mandibles; scape below; space between antennae; small spot on either side of anterior ocellus; anterior orbits, broad below, shortened above; narrow posterior orbits abbreviated above; lateral spot on prothorax joined with spot on tubercle; fascia on pronotum; short lateral line on scutum above base of wing; narrow fascia on posterior border of scutellum; very narrow fascia (almost obsolete) on posterior border of metanotum; pair of triangular spots on posterior surface of propodeum; small spot on lateral angle continuous with spot on side of propodeum; pair of spots on metapleura; small spot on mesopleura; broad, continuous fasciae on tergites 1-5; first with broad medial anterior emargination, deepest at midline; second, third, and fourth each with broad anterior emargination and slight median notch; fifth with shallow anterior biemargination; median spot on sixth tergite; tip of seventh; lateral spots on sternites 2-4, those on 2 and 3 connected by narrow apical lines; spot on anterior coxa; femora in part; tibiae, except line on first pair; and tarsi; *pale yellow*.

The pubescence is white, long and dense on head, thorax, propodeum, and first segment of abdomen. The mandibles bear only a single weak tooth. The flagellum is black above, testaceous below; it shows no special modifications that can serve as specific characters. The legs show no special developments. The second sternite bears a weakly developed median carina and the sixth is plain.

Length about 18 mm. Described from a single male from Rio de Janeiro, Brazil.

*Type* (male).—In the Carnegie Museum in Pittsburgh, Pa.

**BEMBIX BEUTENMULLERI Fox**

*Bembex beutenmulleri* Fox, Journ. N. Y. Ent. Soc., vol. 9, 1901, p. 83.

*Bembex obsoleta* HOWARD, Insect Book, 1904, pl. 4, fig. 36.

*Bembyx obsoleta* ROHWER, Proc. U. S. Nat. Mus., vol. 41, 1912, p. 467.

*Bembix beutenmulleri* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 105.

The male of this species resembles the male of the *pruinosa* in having the seventh sternite developed in the form of a grooved spine, but differs from that species in having the maculations greatly re-

duced and yellow in color, and in having a pair of small, approximated processes on the sixth sternite. This combination of secondary sexual characters distinguishes it from the male of *hinei* Parker, to which it has a superficial resemblance. The female of this species can be distinguished from the female of *hinei* by the character of the inner eye-margins, which on this species are distinctly divergent at the clypeus.

## SPECIMENS EXAMINED

CALIFORNIA: Los Angeles County (Coquillett).

**BEMBIX OCCIDENTALIS** Fox

*Bembex occidentalis* FOX, Proc. Acad. Cal. Sci., ser. 2, vol. 4, 1893, p. 10.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 868.—FOX, Proc. Acad. Nat. Sci. Phila., 1895, p. 362.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 509.

*Bembex occidentalis* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 106.

Like the males of *pruinosa* and *beutenmulleri*, the male of this species has the seventh sternite developed in the form of a grooved spine, and like *beutenmulleri*, it has a pair of small, approximated processes on the sixth sternite. This species, in both sexes, is conspicuous for its extensive yellow maculations. The inner eye-margins on both sexes are divergent at the clypeus. The mandibles are slender, almost straight, and, even on the female, almost devoid of teeth on the inner margin.

## SPECIMENS EXAMINED

ARIZONA: Bill Williams Fork (August, F. H. Snow); Phoenix; Yuma (August 14, 1905, H. Brown).

CALIFORNIA.

LOWER CALIFORNIA: San Jose del Cabo.

NEW MEXICO: (C. F. Baker).

OREGON: Van Sickle Canyon (September 13, 1904, E. S. G. Titus).

**BEMBIX INFUMATA** Handlirsch

*Bembex infumata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 841.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 506.

*Bembex nubilipennis* CAMERON, Biol. Centr.-Amer., Hym., vol. 2, 1888-1890, p. 101 (misidentification).

The male of this species has the wings almost clear, while the wings of the female are distinctly infumated at the base. On both males and females the maculations are almost white. The second and sixth sternites of the male bear conspicuous processes and the sixth bears, in addition to the median process, a pair of well-developed lateral processes. Only three specimens of this species are found in the United States National Museum, a male and a female

bearing the label, "Guadalajara, VII, 27, Jal. Mex., McClendon," and a second male bearing only the label, "Mexico." Handlirsch based his description of the species on three females from Guajuato, Mexico.

**BEMBIX LITTORALIS** Turner

*Bembex littoralis* TURNER, Proc. Zool. Soc. Lond., 1910, p. 353.

I have before me a single male of this species determined by Turner and bearing the label, "Port Darwin, 12 '02." The clypeus, except a very narrow apical border, is black and the frons, except a small area between the antennae and a small spot on each side the anterior ocellus, is likewise black. The thorax, except the narrow posterior border of the pronotum and the tubercles, and the propodeum are entirely black. The maculations on the abdomen are limited to widely separated narrow fasciae on tergites 2-5 and lateral spots on sternites 2-4. The antennae are without structural modifications, the middle femora are smooth below, the second and sixth sternites bear processes, and the seventh tergite is triangular in outline and roundly pointed at the apex.

**BEMBIX INOPS** Handlirsch

*Bembex inops* HANDLIRSCH, Sitz. Akad. Wissensch, Wien, Math.-Nat. Cl., vol. 102, 1893, p. 833.

I have before me a male and a female of this species identified by Handlirsch and obtained by the United States National Museum as an exchange. They bear the label, "Ihering, Rio Grande, Brasil." As pointed out by Handlirsch, this species closely resembles *Bembix multipicta* Smith, of which species it may prove to be only a regional variety.

**BEMBIX MULTIPICTA** Smith

*Bembex multipicta* SMITH, Ann. Mag. Nat. Hist., vol. 12, 1873, p. 300.—HANDLIRSCH, Sitz. Akad. Wissensch, Wien, Math.-Nat. Cl., vol. 102, 1893, p. 831.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 509.

The fasciae on all tergites on both sexes are interrupted and that on the second incloses, more or less perfectly, a pair of black discal spots. On all specimens before me the scutum bears a pair of narrow discal lines, much reduced on one female. On the specimens from Mexico (two males and two females) the maculations on the thorax, propodeum, and abdomen are white. On a single female from Brazil the maculations are yellow, those on the tergites, the metanotum and dorsum of propodeum being pale yellow. The three females agree in having a more or less well developed dusky spot above on the apical segment of all tarsi. The black on the legs is much more extensive on the female from Brazil than on those from Mexico.



## SPECIMENS EXAMINED

BRAZIL: Diamantinas, Minas Geraes (November 14-18, 1919, Cornell University Expedition).

MEXICO: Atencingo (June 1, 1922, E. G. Smyth); San Rafael, Jicoltepec; Tuxpan, Jalisco (September 3, McClendon).

Handlirsch reports this species also from Guatemala; Demerara; Bogota; and Monta, Peru.

## BEMBIX FLAVOLATERA, new species

Figures 94, 95

*Type* (male).—Black: labrum; mandibles, except tips; lower part of frons prolonged by a narrow line upward to meet a transverse series of three spots below anterior ocellus; broad anterior orbits shortened above; scape below; posterior orbits narrowed above; prothorax except narrow line in front of tubercles; broad lateral lines and pair of conspicuous discal lines on scutum; triangular lateral spots on scutellum; minute lateral spots on metanotum; sides of propodeum (but not lateral angles); large spot on metapleura; mesopleura almost entirely; fasciae on tergites 1-4 interrupted, those on 5 and 6 continuous; fascia on first tergite narrowest and most widely interrupted; fasciae on tergites 2, 3, and 4 broadly bisinuate on anterior dorsal border; fasciae on 5 and 6 acutely emarginate at midline on posterior border; second sternite, except narrow median line terminating on anterior border of tubercle and small pair of basal lateral black spots; third and fourth sternites almost wholly; broad fascia on fifth; apical fascia on sixth; coxae and trochanters more or less; femora, except black line on posterior surface of first pair and basal part of third; tibiae, except narrow line above on all; and tarsi; *yellow or white*. The white is limited to the apical fascia on the sixth sternite and to the fasciae on the tergites, of which those on tergites 1-3 show traces of yellow on their anterior margins, and particularly at the sides.

The flagellum is black above but light colored below, and while some of the segments show specialized areas, none of them are excavated or spinose. The terminal segment is only slightly curved and at the apex is roundly truncate. The second sternite bears a large, median tubercle or process, whose apex is curved posteriorly and sharply pointed. The sixth sternite bears a broad triangular raised area, whose apex on the median line can scarcely be called a point. The middle femora are plain. The anterior metatarsus bears seven spines, of which the basal one is small. The wings are hyaline and the second abscissa of the cubitella is lacking. The pubescence on head, thorax, propodeum, and base of abdomen is white and somewhat longer than is usually the case in this genus. The form of the

apex of the seventh tergite is peculiar, as is shown in Figure 95. The seventh sternite is narrowed and rounded at the apex and is carinate on the midline.

Length about 15 mm. This species is closely related to *B. littoralis* Turner, with which it agrees in the character of the genitalia, the antennae, the processes on the sternites, and the wings. It differs in the form of the seventh tergite and particularly in the extent of its maculations. It is also somewhat larger than *littoralis*. If it were not for the great difference in the extent and in the color of the maculations, I should be inclined to consider this individual only a variety of *littoralis*, which, according to Turner, is a variable species. Described from a single male bearing the label, "S. Australien, Hermannsburg, Finke River v. Leonhardt G."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX AGRESTIS, new species**

Figures 80-82

*Type* (male).—Black; labrum; clypeus; mandibles, except tips; short, broad anterior orbits; spot on either side anterior ocellus; space between antennae; scape below; posterior orbits not reaching vertex; narrow line on posterior border of pronotum; apical half of tubercle; minute lateral spots on posterior border of metanotum interrupted fascia on propodeum, broadest on posterior surface; continuous fasciae on tergites 1-6, the first narrow and somewhat sinuate, second inclosing a pair of dorsal black spots, third, fourth, and fifth broadly biemarginate on anterior dorsal border; median spot on seventh tergite extending to apex; lateral spots on sternites 2-6; median spot on second sternite; femora in varying degree; tibiae, except large spot below on all; and tarsi; *yellowish white*.

The flagellum is pale beneath and shows no special modifications, being neither spinose nor excavated. The middle femora are neither serrate nor dentate. The second sternite bears a median, laterally compressed tubercle whose sides are provided with numerous hairs as is the surface of the sternite generally. The sixth sternite bears a bluntly pointed, triangular median process and the seventh, whose apical border is emarginate at midline, bears a conspicuous median carina. The seventh tergite is truncate at the apex.

The *allotype* (female) resembles the type very closely in its maculations. The color is more yellowish than on the type. There is a spot on side of prothorax connected with spot on tubercle; a conspicuous spot on mesopleura; spot on side of propodeum. The sixth sternite is black. The sixth tergite is narrowed and rounded at the apex and the sides are only slightly sinuate. On its sides are found

a series of short, stout, spinelike hairs, among which are numerous long slender hairs, but neither extend to the apex.

The wings on this species are hyaline. The pubescence is normal, being most conspicuous on propodeum and base of first abdominal segment. There is a slight carina between the antennae and the anterior metatarsus is provided with six spines.

Length 16 mm. Described from one male and one female, each of which bears the label "Abessinien Eritrea bei Asamara, 2.III.13, Dr. Klass, S. G."

*Type*.—In Zoologisches Museum der Universitat, Berlin.

#### BEMBIX TEXANA Cresson

*Bembex texana* CRESSON, Trans. Amer. Ent. Soc., vol. 4, 1872, p. 219.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 830.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 514.

*Bembix texana* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 111.

On this species, both males and females, the maculations are white, sometimes slightly tinged yellowish. The wings are almost hyaline. The fascia on the second tergite incloses, sometimes completely, sometimes incompletely, a pair of black discal spots. On the clypeus of the female are invariably present a pair of black basal spots that vary in prominence on different specimens. The dorsum of the propodeum and the metanotum are without maculations and those on the scutellum and scutum are limited to small lateral spots. The middle femora of the male are smooth beneath.

#### SPECIMENS EXAMINED

ARKANSAS: Daleville (September 13, 1904, C. R. Jones).

FLORIDA: Crescent City (April 28, 1908, Van Duzee); Enterprise (May 16); Jacksonville (Ashmead); La belle (April 27, 1912); Lake Harney (May 3); Sanford (April 30, 1908, Van Duzee).

GEORGIA: Billy's Island, Okefenokee Swamp (June, 1912); Spring Creek (July 16-19, 1912); Tifton (May 6, 1896).

LOUISIANA: Fuierston (July 6, 1903, A. W. Merrill); Logansport (June 8, 1906, W. D. Pierce); New Orleans (July).

NEW MEXICO.

TEXAS: Dallas (June 2, 1907, W. W. Yothers); Rosser (June 28, 1905, C. R. Jones).

#### BEMBIX MELANASPIS Parker

*Bembix melanaspis* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 109.

Through its infumated wings and extensive yellow maculations this species resembles *nubilipennis*, but the two species are quite distinct. On the male of this species the flagellum is neither spinose nor dentate, the middle femora are smooth below, the sixth sternite lacks small lateral processes, and the genitalia are different from



those of *nubilipennis*. The female can readily be distinguished from the female of *nubilipennis* by the presence of black, more or less extensive, on the clypeus, which on *nubilipennis* is entirely yellow.

ARIZONA: (C. F. Baker).

CALIFORNIA: Bard (August 14, 1920, H. R. Reed); Los Angeles County (Coquillett); San Bernardino County (Coquillett).

#### BEMBIX TROGLODYTES Handlirsch

*Bembex troglodytes* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 829.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 515.

*Bembix troglodytes* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 108.

This species and the following one (*helianthopolis*) are closely related and are not likely to be confused with any other North American species. On both species the antennae of the males are plain, neither spinose nor excavated, the middle femora are smooth below, and the fasciae on the tergites, except that on the first, are continuous, and that on the second incloses, either perfectly or imperfectly, a pair of black discal spots. *Troglodytes* is much more slender in build than *spinolae* and its related species. The maculations are yellow.

Of the 11 specimens on which Handlirsch based his description of this species, 3 bore the label "Mexico." Apparently the locality from which the other specimens were obtained was unknown.

#### SPECIMENS EXAMINED

ARIZONA: (C. F. Baker).

NEW MEXICO: Las Cruces (August 27, Townsend).

TEXAS: Austin; Cypress Mills (Ashmead); Huntsville (C. Hartmann).

#### BEMBIX HELIANTHOPOLIS Parker

*Bembix helianthopolis* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 113.

This species is closely related to *troglodytes*, as was pointed out above. The male may be distinguished from the male of *troglodytes* by the lack of discal marks on the scutum, lack of maculations on the dorsum of the propodeum, and by the difference in the form of the genital stipes. The females of the two species are separated on the difference in their maculations: *helianthopolis* has the labrum (except sometimes the extreme lateral margins), the scape, and the sixth tergite black; *troglodytes* has these part yellow or conspicuously maculated with yellow.

#### SPECIMENS EXAMINED

KANSAS: Barber County (1916, R. H. Beames).

TEXAS: Victoria (July 15, 1915, J. D. Mitchell).

## BEMBIX BAHIAE, new species

## Figure 90

*Type* (male).—Black: labrum; mandibles, except tips; clypeus; scape below; area between antennae extended upward; pair of spots below anterior ocellus; broad anterior orbits shortened above; posterior orbits narrowed and shortened above; posterior border of pronotum; sides of prothorax, except large irregular spot in front of tubercle connected with black of pronotum; short, lateral lines above tegulae on scutum; pair of conspicuous lateral spots on scutellum; narrow, interrupted fasciae on metanotum; irregular spot on lateral angles of propodeum; metapleura; larger spot above and smaller spot below on mesopleura; broad fasciae on tergites 1–7; fasciae on tergites 1 and 5 narrowly interrupted at midline; fasciae on tergites 2–4 biemarginate on anterior dorsal border and deeply notched at midline on posterior border; lateral spots on sternites 2–5; greater part of femora; tibiae; and tarsi; *yellow or white*. Maculations on posterior border of pronotum and on scutellum and metanotum are white; elsewhere they are light yellow.

The clypeus is strongly and roundly arched and is scarcely carinate at the base. The frons is wide and between the antennae is weakly carinate. The inner eye-margins are parallel. The flagellum is black above, testaceous below, and none of its segments are spinose or excavated. The anterior metatarsus bears six spines and the middle femora are neither serrate nor dentate. The second sternite bears a small, thin, laterally compressed process and the sixth a narrow, triangular, sharply pointed process. The seventh sternite bears a median longitudinal carina that terminates at the apex of the sternite in a process much resembling that on the second sternite. The apex of the seventh tergite, is broadly triangular and roundly pointed. The pubescence is normal and the wings are hyaline.

Length 15 mm. Described from a single male (the type) bearing the label, "Bahia Blanca, Argentina."

*Type*.—Cat. No. 40846, U.S.N.M.

## BEMBIX DIVERSIPENNIS Smith

*Bembex diversipennis* SMITH, Ann. Mag. Nat. Hist., vol. 12, 1873, p. 297.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 102, 1893, p. 786.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 504.—TURNER, Ann. Mag. Nat. Hist., ser. 8, vol. 10, 1912, p. 373.

I have before me two females that have been referred to this species. One bearing the label, "Togo Mangu, I. 02, G. Theierry S.," has been determined by Bischoff. This specimen bears well-developed fasciae

on the scutellum, metanotum, and dorsum of the propodeum, and well-developed fasciae on tergites 1-5, of which only that on tergite 5 is interrupted (narrowly); that on tergite 1 bears a single anterior emargination; that on 2 bears a pair of inclosed black discal spots; those on 3 and 4 are anteriorly biemarginate; and 6 is ferruginous. The other specimen bearing the label, "D. O. Afrika, Tabora, 7.08, Wintgens S. G.," differs from the first in having the clypeus yellowish; in having the ferruginous on the sixth tergite almost obliterated; and in having the fascia on the first tergite widely interrupted. The two specimens agree in having the antennae ferruginous, in having the clypeus and frons, except a black area about the anterior ocellus, predominantly ferruginous, in having the maculations of the prothorax ferruginous, in having the sides of the mesothorax, metathorax, and propodeum black, in having the lateral spots on the sternites reduced or wanting, and in having the basal half of the wings heavily infumated. The eyes are strongly divergent at the clypeus.

This species seems to be widely distributed over the eastern, central, and southern parts of Africa. Smith described the species from Angola. Handlirsch reports it from Massailand, Congo, Zanzibar, and Dar-Es-Salaam, German East Africa. Turner reports it from Nyassaland, Mashonaland, and Harar, Abyssinia.

#### BEMBIX MADECASSA Saussure

*Bembex madecassa* SAUSSURE, Mitth. Schweiz, Ent. Ges., vol. 8, 1891, p. 260.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 818.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 507.

I have of this species a single female determined by Kohl and bearing the label, "O Madagaskar, Tamatave, Voelzkow S., XI. 04." On this specimen the thorax and propodeum are entirely black; tergites 1 and 5 bear only vestiges of lateral spots; tergites 2, 3, and 4 bear narrow sinuate fasciae interrupted at midline; the sixth tergite and the sternites are entirely black. This species seems to be confined to Madagascar.

#### BEMBIX VARIABILIS Smith

*Bembex variabilis* SMITH, Cat. Hym. Ins. Brit. Mus., vol. 4, 1856, p. 325.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 846.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 515.—TURNER, Ann. Mag. Nat. Hist., ser. 8, vol. 16, 1915, p. 446.

I have before me a single female that agrees quite closely with Smith's description. It bears the label, "Cairns, N. Q., J. F. Illingworth, Collector." This species seems to be widely distributed over Australia.



## BEMBIX ATRIFRONS Smith

*Bembex atrifrons* SMITH, Cat. Hym. Ins. Brit. Mus., vol. 4, 1856, p. 327.

*Bembex flavilabris* SMITH, Ann. Mag. Nat. Hist., ser. 4, vol. 12, 1873, p. 299.

*Bembex atrifrons* TURNER, Proc. Zool. Soc. London, 1910, p. 353; Ann. Mag. Nat. Hist., ser. 8, vol. 16, 1915, p. 441.

I have at hand a single female that I have referred to this species. It differs slightly from Smith's description: the extreme ventral margin of the clypeus and its extreme ventro-lateral angles are maculated; shortened, narrow anterior orbits are present; there are lateral spots on the prothorax united with the yellow on the tubercles; and there are small, round lateral spots on the scutellum. The metanotum, propodeum, mesopleura, metapleura, the sixth tergite, and all sternites are black. The specimen bears the label, "Adelaide, Behr S." Turner reports this species from Yallingup and Busselton, West Australia, and also from South Perth.

## BEMBIX NUBILOSA, new species

*Type* (female).—Black: labrum; mandibles, except tips; clypeus, except pair of small basal spots, of which one is almost obsolete; area between antennae; small vertical stripe below anterior ocellus; scape below; broad anterior orbits, shortened and deflected inward above; narrow posterior orbits, shortened above; tubercles and narrow posterior margin of pronotum; spot on tegula; small lateral spots on scutellum; spot on posterior-lateral angles of propodeum; short, narrow line on mesopleura; broad fasciae on tergites 1–5, first interrupted medially, second and third broadly and deeply biemarginate on anterior border and also widely emarginate at middle on posterior border, fourth and fifth similar to second and third, but with emarginations less well developed; lateral spots on sternites 2–4; femora apically; tibiae, except line below on first and second pairs; and tarsi; *yellow or creamy white*.

The flagellum is black above, yellowish below, especially toward the apex. The wings are heavily infumated, the hind wings throughout and the basal three-fourths of the front wings. The pubescence is white, dense, and comparatively short on head, thorax, and propodeum. On the abdomen it is shorter but unusually well developed, especially on the tergites of the last three segments. The frons is very wide and the inner eye-margins parallel. The sixth tergite is coarsely punctate, even to the apex, giving the surface a roughened appearance. The second sternite is finely punctured with numerous larger punctures among the fine ones; on the midline there is an evident, though not prominent, carina. The fasciae on the tergites are a pale creamy, almost white, color, while the legs are orange yellow.

The paratype differs from the type in the absence of any black on the clypeus; in the presence of a yellow spot on the side of the prothorax and another on the metapleura; and in the fact that the lateral spots on the scutellum form a curved fascia interrupted medially. In Handlirsch's table this species runs to *infumata*, but it differs from that species in the greater infumation of the wings and in having all the fasciae on the tergites, except that on the first, continuous.

Length 17 mm. Described from two females from San Luis Potosi, Mexico.

*Type*.—In the collection of Massachusetts Agricultural College, Amherst, Mass.

**BEMBIX LUZONENSIS, new species**

*Type* (female).—Black: labrum; mandibles, except tips; clypeus, except broad, black basal border; line on scape below; lower border of frons limited between the antennae by a black spot extending from the insertion of one to the insertion of the other and prolonged upward by a very narrow median line dividing the yellow above the antennae along the midline; spot below anterior ocellus connected with yellow of frons below; short anterior orbits; posterior orbits very narrow above; narrow posterior border of pronotum; side of prothorax, except spot on tubercle; small spot on lateral angle of propodeum; broad, vertical anterior spot on side of propodeum; two elongated spots on metapleura; oval posterior spot and large, irregular anterior spot on mesopleura; widely separated lateral spots on first tergite; continuous fascia on second tergite with wide posterior dorsal emargination that is extended into the fascia on right and left; continuous fascia on third tergite with pair of deep, rounded, anterior, dorsal emarginations and broad, shallow, median posterior emargination; continuous fascia on tergite 4 similar to that on 3; fascia on tergite 5 interrupted at dorsal midline; small lateral spots on sternites 2-3; anterior coxæ below; line on anterior and posterior borders of all femora; all tibiae above; and anterior tarsi above; *pale creamy yellow*.

The flagellum is black. The inner eye-margins are very slightly divergent at the clypeus. The pubescence is very short and inconspicuous. The wings are lightly and uniformly infumated and the second abscissa of both radiella and cubitella is present. The anterior metatarsus is provided with only five spines. The disk of the second sternite is smooth and shining and bears scattered, coarse punctures. The sixth sternite is feebly carinate on midline and is densely covered with very fine punctures, among which are scattered many coarse ones and consequently is covered with a fine pubescence,

among which are present many coarser hairs. The sixth tergite, which is bluntly triangular and broadly rounded at the apex, is finely punctate and covered with a fine, dense, closely appressed pubescence, among which near the lateral margins are numerous coarser and longer hairs. The extreme apical margin is smooth and shining.

Length 20 mm. Described from a single female bearing the label, "Philippinen, Insel Luzon, Rolle V."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX NUPERA, new species**

*Type* (female).—Black: labrum; mandibles except tips; clypeus in part; broad anterior orbits; pair of spots on frons below level of anterior ocellus; posterior orbits broad below and each interrupted at vertex; posterior broader of pronotum enclosing a pair of elongated black lateral spots; sides of prothorax; lateral lines, pair of transverse posterior spots and vestiges of pair of longitudinal discal lines on scutum; fascia on posterior border of scutellum; fascia on metanotum; vestiges of fascia on propodeum; large spot on side of propodeum (not reaching lateral angle); line on anterior margin of metapleura; two spots on mesopleura; conspicuous, continuous fasciae on tergites 1–5, that on first slightly narrowed medially, those on 2–5 bisinuate on anterior border the sinuations on tergite 2 widely separated, the width of the separation decreasing from two to five, those on 2–4 acutely emarginate at midline on posterior border; apex of tergite 6; fasciae on posterior border of sternites 2–5; tibiae in part; and tarsi; *a light and variable shade of yellow*. Clypeus in part; scape; flagellum below; legs, except tibiae in part and tarsi; large median spot on sternite 2 almost interrupting the fascia; median transverse area between the black basal border and the posterior fascia practically interrupting the fascia on sternites 3–5; sixth sternite entirely; and basal part of the maculation on tergite 6; *ferruginous*.

The flagellum is dusky above, being darkest toward the apex. The ferruginous is most in evidence on the basal segments of the legs and on the sternites. The clypeus on its basal half is strongly carinate and its color is a mingling of light yellow and ferruginous with a basal spot on either side the carina that is almost black. The basal portion on either side the carina is covered with short, dense, silvery pubescence. The frons is wide and carinate between the antennae and the inner eye-margins are slightly divergent at the clypeus. The anterior metatarsus is provided with seven spines. The wings are hyaline and the second abscissa of the cubitella is lacking. The disk of the second sternite is smooth and shining and



except on the midline bears numerous coarse punctures, while those at the sides are much finer. The sixth tergite is broadly rounded at the apex and the sixth sternite is noncarinate. The pubescence, which is short and white, is almost lacking on dorsum of thorax and propodeum.

Length 20 mm. Described from a single female bearing the label, "Witu Lamu, G. Denhardt G."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX CAPENSIS** Lepeletier

*Bembex capensis* LEPELETIER, Hist. Nat. Ins. Hym., vol. 3, p. 273.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 853.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 503.

To this species I have referred a single female bearing the label, "D. S. W. Afrika, Lindt S." The clypeus is covered with fine, silvery pubescence. In other respects it conforms very closely to the description of the species as given by Handlirsch, who reports it from South Africa (Transvaal and Capeland).

**BEMBIX GRACILENS**, new species

Figure 109

*Type* (female).—Black: narrow fascia on posterior dorsal border of pronotum, connecting large, lateral spots; tubercle and narrow line running downward from it on side of prothorax; narrow fascia on posterior border of scutellum; fascia on metanotum; interrupted fascia on dorsum of propodeum; lateral angles of propodeum; broad fasciae on tergites 1-5, first greatly narrowed (almost interrupted) at dorsal midline, second inclosing pair of elliptical, dorsal spots, third strongly and fourth weakly biemarginate on anterior dorsal border; small lateral spots on sternites 2-5; *yellow*. Clypeus, antennae, except tips above; narrow line between antennae and pair of spots above them; three spots on frons at level of anterior ocellus; broad anterior orbits deflected inward from eye-margins above anterior ocellus; posterior orbits; apex of sixth tergite; apex of sixth sternite; narrow apical lines joining yellow lateral spots on sternites 2-5; legs for the most part; *ferruginous*. The clypeus and mandibles, as well as the lower part of the posterior orbits, are more yellow than ferruginous. The tibiae and tarsi also show this mingling of yellow and ferruginous and the femora at the base are marked with black.

The basal half of the wings is strongly infumated, whereas the apical part is hyaline. The pubescence is white and comparatively abundant on head, sides of thorax, and on the propodeum. On the

clypeus it is short, dense, and silvery. The frons is wide, weakly carinate between the antennae, and the inner eye-margins are approximately parallel. The anterior metatarsus bears six spines. The disk of the second sternite is shining and bears scattered, coarse punctures. The apical part of the sixth tergite is plainly carinate at midline.

In Handlirsch's table this species runs, although not accurately, to *B. tricolor* Dahl. It differs from that species in having no black on the clypeus and in the absence of any maculations on the sides of the mesothorax, metathorax, and propodeum. Furthermore, the wings of this species are strongly infumated at the base, while the apical portion is hyaline. The insect is decidedly slender in form and the sixth tergite is broadly rounded at the apex.

Length 17 mm. Described from a single female bearing the label, "D. S. W-Afrika, 1901, Lübbert S. V."

*Type*.—In the Zoologisches Museum der Universität, Berlin.

BEMBIX LIVENTIS, new species

*Type* (female).—Black: labrum; mandibles, except tips; clypeus, except pair of large, dark basal areas; scape below; lower part of frons; pair of rounded spots below anterior ocellus; broad, anterior orbits barely reaching the level of anterior ocellus; broad, posterior orbits, each greatly narrowed and interrupted at vertex; prothorax, except anterior transverse dorsal spot and dusky line in front of tubercles; broad, lateral lines and pair of very narrow, obscure, longitudinal, discal lines on scutum; narrow fascia on posterior border of scutellum; very narrow fascia on metanotum; shortened fascia on propodeum interrupted at midline; almost the entire side of propodeum (but not the lateral angles); anterior portion of metapleura; mesopleura almost wholly; fascia on first tergite narrow and interrupted at dorsal midline; fascia on second tergite broader, interrupted at midline and bisinuate on anterior dorsal border; fascia on third similar to that on second; fascia on fourth similar to those on second and third, but continuous; fascia on fifth broken into a central and lateral spots; apical portion of sixth; small posterior lateral spots on sternites 2-5; apical margin of sternite 6; legs, except more or less of the coxae and trochanters, dusky spot below on middle femora, and dark one above and one below on posterior femora; *yellow*, which varies in shade on different parts of the body.

The maculations on the dorsal part of the thorax and on the abdomen are decidedly pale, whereas those on the sides of the thorax and on the legs show a tendency toward ferruginous. The flagellum

is black above, but of a light shade of ferruginous below. The inner eye-margins are a trifle wider apart at the clypeus than at the vertex. The frons is broad and between the antennae strongly carinate. The basal half of the clypeus on the midline is also strongly carinate, while the median apical portion is somewhat flattened. Except the ridge of the carina and the apical flattened part, the clypeus is covered with fine, silvery pubescence. The anterior metatarsus bears seven spines. The disk of the second sternite is shining and on either side the midline are scattered coarse punctures, among which are numerous fine punctures. Only a small, median anterior area is free from punctures. The sixth sternite is slightly carinate on midline and is closely covered with punctures, in which coarse and fine are intermingled. The sixth tergite is broadly rounded at the apex. The wings are clear and the second abscissa of both radiella and cubitella is present, although the latter is much reduced. The pubescence on thorax, propodeum, and abdomen is of normal character. The dorsal surface of the abdomen, when light strikes it at the proper angle, shows a beautiful, bluish iridescence, a character not common among species of this genus.

Length, 20 mm. Described from a single female bearing the label, "D. Ostafrika, Mikidani, II.-IV. 1911, H. Grote S. G."

*Type*.—In the Zoologisches Museum der Universität, Berlin.

**BEMBIX HEXASPILA, new species**

*Type* (female).—Black: labrum; mandibles, except tips; space between antennae continued broadly upward to join, below anterior ocellus, a transverse band that unites with the anterior orbits; broad anterior orbits almost interrupted below junction with transverse band, but above it deflected inward to join the posterior orbits on the vertex; scape, except black line above; posterior orbits broad below; pronotum; broad lateral lines and broad U-shaped discal mark on scutum; broad continuous fascia on scutellum; metanotum; broad, curved fascia on propodeum covering most of its dorsal and posterior surfaces; lateral angles and sides of propodeum; metapleura; mesopleura; mesosternum, except pair of black spots anterior to each middle coxa; very broad, continuous fasciae on tergites 1-5, all acutely emarginate at midline on posterior border, the first with a pair of rounded dorsal spots, of which one is not completely inclosed, second and third each with a pair of elliptical dorsal spots, and fourth and fifth bisinuate on anterior dorsal border; first sternite; second sternite, except large central black spot and pair of small anterior lateral black spots; third sternite, except large median and pair of anterior lateral black spots; fascia on fourth resembling



the maculation on third, but reduced in extent; posterior lateral spots on fifth; extreme posterior lateral edges of sixth; legs, except black stripe above on all femora, small black spot below on anterior tibiae and one above on posterior tibiae, and a varying degree of black on coxae and trochanters; *yellow*. The fasciae on the tergites show two colors, the posterior portion of each fascia being much lighter (more nearly white) than the anterior portion. The first tergite, in addition to the broad dorsal fascia found on its curved surface, bears a conspicuous fascia across its anterior vertical surface. The U-shaped discal mark on the scutum shows a tinge of rufous.

The flagellum above, except the terminal segment, is black; this segment and the lower surface of the flagellum are ferruginous. The clypeus and the lower part of the anterior orbits are covered with a silvery pubescence. Elsewhere the pubescence is short and white and presents the normal appearance. The frons between the antennae and the base of the clypeus at midline are only slightly carinate. The frons is broad and the inner eye-margins are slightly wider apart at the vertex than at the clypeus. One anterior metatarsus bears seven and the other eight spines, of which the two at the apex of each differ greatly from one another in length. The disk of the second sternite is shining and bears only coarse punctures. The apex of the sixth tergite is broadly rounded and on the midline is devoid of punctures. The sixth sternite is noncarinate and is covered with coarse setigerous punctures that become smaller near the basal lateral margin. The first intercubitus vein is almost straight and the second abscissa of the cubitella is lacking.

Length 13 mm. Described from a single specimen bearing the label, "Pusa, Coll. Bingham." It also bears the label, "*Bembex orientalis* Hdl.," but by whom the determination was made is not shown.

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

#### BEMBIX BORNEANA Cameron

*Bembex borneana* CAMERON, Proc. Zool. Soc. Lond., vol. 2, 1901, p. 26.

In the collection of the United States National Museum, bearing the label, "Tambak," is a single female that has been identified as *Bembix borneana* Cameron, but by whom the identification was made is unknown. Cameron based his description of this species on the male alone, the female at that time apparently being unknown to him. It is possible that this specimen was determined by Cameron himself some time after his description of the species and sent to Ashmead in an exchange, but of this we have no proof. If a description of the female of this species has been published, I have not seen it.

This female is smaller than the male Cameron described, being less than 20 mm. in length. The anterior metatarsus is broader and flatter than usual in this genus, thus agreeing with the male from which the species was described. In this respect it resembles *Bembix palmata* Smith, but the dilation of the anterior metatarsus is less pronounced on this specimen than on *palmata*. The clypeus bears a pair of large, basal, black spots; the scutellum and metanotum each bears a narrow, interrupted fascia, and the scutum bears a broken U-shaped discal mark. The propodeum bears a prominent curved fascia, and the sides of the thorax and propodeum are yellow, except a black spot below the tegula on the mesopleura, another in front and above the middle coxa, and a vertical black stripe on the propodeum. The fasciae on tergites 1-5 are narrow, the first interrupted, the second inclosing a pair of black discal spots, and the third, fourth, and fifth biemarginate on anterior border. The yellow on the sternites is limited to small lateral spots on 2 and 3. The anterior metatarsus is provided with only five spines.

#### BEMBIX PALMATA Smith

*Bembex palmata* SMITH, Cat. Hym. Ins. Brit. Mus., vol. 4, 1856, p. 325.

*Bembex tridentifera* SMITH, Ann. Mag. Nat. Hist., ser. 4, vol. 12, 1873, p. 298.

*Bambex palmata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl.

vol. 102, 1893, p. 751.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 511.—

TURNER, Ann. Mag. Nat. Hist., ser. 8, vol. 16, 1915, p. 438.

I have at hand a single female that I have referred to this species. On the lateral border of the clypeus running to the ventral margin is a short but deep depression, causing the clypeus at this point, when viewed from in front, to appear to overhang the base of the mandibles. With regard to the maculations, this specimen agrees with Handlirsch's description of the species. It is from Australia and bears the label, "N. Queensland, Coll. Bingham."

#### BEMBIX SPIRITALIS, new species

*Type* (female).—Black: labrum, mandibles, except tips; clypeus, except large medial black spot; scape below; frons between antennae; broad but shortened anterior orbits; three spots on frons below the level of anterior ocellus; pair of spots on vertex not connected with orbits; broad posterior orbits, above extending inward and downward on the occiput; prothorax almost wholly; broad lateral lines and U-shaped discal mark on scutum; broad fascia on posterior border of scutellum; fascia on metanotum; broad, curved fascia on propodeum; mesopleura, metapleura, and side of propodeum almost wholly; broad, continuous fasciae on tergites 1-5, occupying the anterior part of the tergites and leaving an evident posterior black

border; fasciae on tergites 1-3 each inclosing a pair of black discal spots, and those on 4-5 deeply emarginate on anterior border; small lateral spots on sternites 2-4; femora largely; tibiae, except spot above on first pair and spot below on hind pair; and tarsi; *creamy yellow*.

The fasciae on the tergites are lighter in shade than the maculations on the body, some of which take on an orange shade of yellow. The mandibles are long and slender and are unidentate. The proboscis (maxillae) is longer than is normal in this genus and when at rest can not be completely concealed beneath the labrum. The clypeus is unusually prominent and basally is distinctly carinate on the median line. Apically the clypeus is somewhat flattened medially and its apical margin is strongly arcuate in form. The frons is very broad, forming more than one-third of the total width of the head. The flagella are missing. The anterior metatarsus is provided with six spines. The yellowish pubescence is long and unusually well developed on the head, thorax, and propodeum. The sixth tergite is narrowed and roundly pointed at the apex.

Length 15 mm. Described from a single female, the type, bearing the label, "Espirito Santo, Brasil, H. Rolle, Berlin W."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

#### BEMBIX MELANCHOLICA Smith

*Bembex melancholica* SMITH, Cat. Hym. Ins. Brit. Mus., vol. 4, 1856, p. 328.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 783.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 508.

In the collection of the United States National Museum there is a single female of this species received in exchange, but by whom identified is not known. It bears the label, "W. Sumatra, Pedang, 23.XII. 08, Schoede, S. G." In all respects, except that of the color of the maculations, this specimen agrees quite closely with Smith's description of the species. Instead of being "livid yellow," as Smith describes the maculations, they are on this specimen very pale, hardly to be regarded as yellow. The abdomen, however, shows that blue-black iridescent ground color that Smith reports for this species. In addition to Sumatra, Handlirsch lists the points of distribution: Borneo, Malacca, Singapore, Madras, Salvatti, and Morty Islands.

#### BEMBIX BORREI Handlirsch

*Bembex borrei* HANDERLISCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 866.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 502.

In the United States National Museum are two females that I have referred to in this species. They bear the label, "Culasi Panay, P. I., June, 1918, McGregor." A description follows:



Black: labrum; mandibles except tips; clypeus in part; minute spot between antennae; pair of spots at their insertion; minute spot below anterior ocellus; spot on scape below; anterior orbits, almost obsolete; posterior orbits narrowed and shortened above; fascia on pronotum continued on tubercles and sides of prothorax; pair of lateral spots on side of prothorax; lateral lines and U-shaped discal mark interrupted at midline on scutum; fascia on posterior border of scutellum; fascia on metanotum; curved fascia on propodeum extended on posterior surface and narrowly interrupted; lateral angles and side (in part) of propodeum; vertical spot on metapleura; triangular spot on mesopleura; continuous fasciae on tergites 1-5, first with pair of rounded dorsal and pair of pointed lateral anterior emarginations, second and third narrowed at midline and each enclosing pair of discal spots, fourth and fifth broadly biemarginate on anterior border; pair of lateral spots on sternites 2-5, those on second and third extended and attenuated medially; femora, except line on both anterior and posterior surface; tibiae, except line on anterior and posterior surface of first and second pairs and on posterior surface of third pair; and tarsi; *yellow*.

The markings on the thorax and abdomen are bright lemon yellow; those on the legs are darker in shade; the markings on the head are very pale. The flagellum is black and the wings are hyaline. The pubescence is light in color and normal in development. The sixth tergite is roundly pointed and is uniformly and rather coarsely punctate, except at the apex and on the midline of the posterior half of the tergite, which are devoid of punctures. The frons is relatively broader than usual and the inner eye-margins are parallel. The black basal border of the clypeus on one specimen is expanded at the midline so as to reach almost to the ventral border of the sclerite; on the other specimen the black is confined to a pair of irregular basal spots.

**BEMBIX LONGIPENNIS, new species**

*Type (female).*—Black: labrum; clypeus, except a pair of narrow lines paralleling the basal margin; mandibles, except tips; frons to level of anterior ocellus, except pair of large black spots; scape, except small apical spot above; anterior orbits deflected inward at anterior ocellus and reaching almost to vertex; posterior orbits broad below; prothorax, except three anterior black dorsal spots; broad lateral lines and long, narrow discal lines on scutum; fascia on posterior border of scutellum; fascia on posterior border of metanotum; curved fascia on dorsum of propodeum broadly extended on posterior surface; lateral angles and sides of propodeum almost wholly; metapleura; mesopleura almost completely; broad

fascia on first tergite narrowed and narrowly interrupted at mid-dorsal line; broad fasciae on tergites 2-5, all slightly sinuate on posterior dorsal border, that on 2 inclosing pair of large, elliptical spots and acutely emarginate at median anterior border, that on 3 biemarginate, and those on 4 and 5 bisinuate on anterior border; apex of sixth tergite; pair of small anterior spots on sternite 2; lateral spots connected by very narrow apical lines on sternites 1-5, each apical line apparently interrupted at mid-ventral line by a dark ferruginous spot; legs, except more or less of basal joints, line above on all femora, narrow line below on tibiae, and small spot or line at base above on tibiae; *yellow*.

The flagellum below is ferruginous; above it is quite dark but shades to ferruginous at the apex. The anterior metatarsus is provided with six spines, of which the basal one is quite small. The wings are hyaline and very long, reaching the end of the abdomen. The second abscissa of both radiella and cubitella is present. The frons between the antennae and the adjacent basal part of the clypeus are distinctly carinate. The sixth tergite is coarsely punctate and the apical part is distinctly ferruginous. The sixth sternite is distinctly carinate on the midline and, like the sixth tergite, its apex is marked with ferruginous. The disk of the second sternite is smooth and shining and bears numerous, scattered, coarse punctures.

The paratype (female) differs from the type in having the fascia on the scutellum interrupted at midline; in having the fascia on the first tergite reduced to lateral spots; in having the inclosed spots on the fascia on the second tergite reduced to anterior emarginations; and in having the fascia on tergite 5 narrowly interrupted at the mid-dorsal line. The ferruginous markings on the sixth abdominal segment are present, but less well developed than on the type.

Length 22 mm. Described from two females, each of which bears the label, "Nyassa-See, Langenburg, 9-19-VIII, 98, Fütteborn S."

*Type*.—In the Zoologisches Museum der Universität, Berlin.

#### BEMBIX LATIFASCIATA Turner

*Bembex latifasciata* TURNER, Ann. Mag. Nat. Hist., ser. 8, vol. 10, 1912, p. 57; Ann. Mag. Nat. Hist., ser. 8, vol. 16, 1915, p. 443.

I have at hand a single female that I have referred to this species. The second sternite (third and fourth also) is entirely yellow; the sixth tergite bears lateral spots; the fasciae on the tergites are broad and only the first is narrowly interrupted. These fasciae on the tergites have their anterior borders yellow and the posterior part white. The scutellum, metanotum, and propodeum each bears a prominent fascia; there is a prominent U-shaped discal mark on the scutum; and there is a pair of black spots on the clypeus. The

specimen bears the label, "S. Australien, Hermannsburg, Finke River, v. Leonhardi G." Turner reports the species also from West Australia.

**BEMBIX LAETA**, new species

Figure 115

*Type* (female).—Black: labrum; mandibles, except tips; clypeus, except pair of black medial spots and pair of very narrow lines at base; lower part of frons connected by vertical line with spot below anterior ocellus; scape below; broad anterior orbits deflected inward from the eye-margin at the vertex; posterior orbits; prothorax, except narrow line in front of tubercles; broad lateral lines and broad unbroken U-shaped discal mark on scutum; broad fascia on posterior border of scutellum; fascia on metanotum; curved fascia on dorsum of propodeum broadly extended on median posterior surface; lateral angles and sides of propodeum; metapleura; greater part of mesopleura; broad fascia on tergite 1, abruptly narrowed and interrupted at dorsal midline; continuous fasciae on tergites 2-4, that on 2 inclosing pair of narrow, elliptical, black spots those on three and four biemarginate on anterior border and all three acutely emarginate at midline on posterior border; fascia on fifth tergite narrowed and interrupted at dorsal midline; lateral spots on tergite 6; lateral spots connected by apical lines on sternites 2-5; coxae and trochanters more or less; femora except spot below and narrow line above; tibiae; and tarsi; *yellow*. The legs of the U-shaped discal mark on the scutum are decidedly rufous in color.

The flagellum is slender, black above, except the terminal segment, which is fuscous, and yellowish below, shading to fuscous at the apex. The frons is broad and the inner eye-margins are approximately parallel. The wings are hyaline and the second abscissa of both the radiella and the cubitella is present. The anterior metatarsus is provided with six spines. The pubescence is light in color, short, and relatively dense on head, thorax, propodeum and base of abdomen. The disk of the second sternite is smooth and shining and bears scattered, coarse punctures. The sixth tergite is narrow and roundly pointed at the apex.

Length 15 mm. Described from a single female bearing the label, "D. O. Afrika, 18, 12, 10, Makonde-Hochld, Grote S. G."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

**BEMBIX BELLATRIX**, new species

Figure 96

*Type* (female).—Black: labrum; mandibles, except tips; scape below; spot between antennae; broad anterior orbits, shortened above,



deflected away from the eye-margins and narrowed; posterior orbits broad below; narrow posterior border of pronotum; sides of prothorax. except irregular black spot in front of tubercles; short lateral lines above base of wings and pair of narrow longitudinal discal lines on scutum; narrow fascia on posterior border of scutellum; narrow fascia on posterior border of metanotum; curved fascia on propodeum, broadened and interrupted at midline on posterior surface; lateral angle continuous with large spot on side of propodeum; large spot on metapleura; smaller spot on mesopleura; broad, continuous fasciae on tergites 1-5; fascia on first tergite with a median anterior emargination extended to right and left, thus producing a large, flattened, heart-shaped area in the fascia; second fasciae with a wider but shallower median anterior emargination partly inclosed; third and fourth fasciae each also with a shallow median anterior emargination; large apical heart-shaped spot on sixth tergite; lateral spots connected by narrow apical lines on sternites 2-5; spot on anterior coxa; femora in part; tibiae, except line above and one below on anterior pair and line below on middle pair; and tarsi; *pale tinged with light creamy yellow.*

The flagellum is black, paler below. The frons is broad and the inner eye-margins are parallel. The dorsal border of the clypeus at the midline is extended upward between the antennae, forming an angle whose apex is above a line marking the lower level of the insertion of the antennae on the frons (fig. 96). Although this modification in the form of the dorsal border of the clypeus is not unique with this species, it is more pronounced than on any species I have so far seen. The frons between the antennae and the dorsal part of the clypeus are distinctly carinate. The anterior matatarsus bears six spines. The wings are hyaline. The sixth tergite is triangular in outline, rather narrow, and roundly pointed at the apex. The second sternite is uniformly, closely, and finely punctate throughout its entire surface, with here and there a few somewhat larger punctures scattered over it.

With the type I have associated as a paratype a single female that may prove to be a female of another species. It is more slender than the type; this is particularly evident with regard to the thorax. The color of the maculations on the abdomen is distinctly greenish yellow. In other respects, including the form of the clypeus and the punctation of the second sternite, it agrees so closely with the type that under the circumstances I am forced to regard it as a variant of this species.

Length about 17 mm. Described from two females, of which the type bears the label, "Brasilien, St. Cath. Joinville, Schmalz S. V.," and the paratype, the labels, "Brasilien, Freir. S." and "3738 Bras."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

## BEMBIX GENEROSA, new species

Figures 107, 108

*Type* (female).—Black: clypeus; labrum; mandibles, except tips; frons below level of anterior ocellus, except pair of black spots; scape, except small spot above; broad anterior orbits; broad posterior orbits united above; prothorax entirely; broad lateral lines and broad U-shaped discal mark on scutum; broad posterior fascia on scutellum; metanotum; broad, curved fascia on propodeum; posterior surface, lateral angles and sides of propodeum; sides and venter of mesothorax and metathorax entirely; continuous fasciae on tergites 1–6, the first with deep, round, median, anterior emargination, almost inclosed, and pair of shallow, posterior, dorsal emarginations, second inclosing pair of elliptical, dorsal, black spots, third, fourth, and fifth biemarginate on anterior border, sixth with anterior, lateral emarginations; second sternite, except large median and small transverse posterior spot; lateral spots on sternites 3–5 connected by broad, apical bands; legs, except small black spot above on posterior femora; *yellow*.

The flagellum, which changes to fuscous at the apex, is black above and yellowish below. The wings are hyaline and the second abscissa of the cubitella is lacking. The anterior metatarsus bears eight spines. The disk of the second sternite is densely covered with minute punctures and is also covered with a very fine, short pubescence. The pubescence elsewhere on the body is unusually short and sparse, in fact, almost lacking. The sixth tergite bears a small pygidial area, which is set off by lateral ridges and whose surface is coarsely punctate and shows an evident median carina. The sixth sternite is densely and finely punctate with coarse punctures scattered over its surface, and is accordingly provided with, fine, dense pubescence, in which are scattered many relatively longer, coarser hairs.

This species stands close to *B. chlorotica* Handlirsch, from which it differs in its slightly smaller size and in the character of its maculations.

Length 16 mm. Described from a single specimen bearing the label, "S. Somala Karo Lola 6. 5. 01, B. v. Erlanger."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

## BEMBIX PIRAPORAE, new species

*Type* (female).—Black: labrum; mandibles, except tips; clypeus; lower part of frons produced upward in a stripe on the midline to join a large spot below anterior ocellus; a smaller spot on either side this large central spot; broad anterior orbits reaching vertex, where they are deflected inward away from eye-margins; scape below;

posterior orbits; prothorax, except black area above and dusky spot in front of tubercles; conspicuous lateral lines and broken U-shaped discal mark on scutum; fascia on scutellum, narrowed toward the midline and rather widely interrupted; fascia on metanotum; curved fascia on propodeum, interrupted at midline on posterior surface; lateral angles and almost the entire sides of propodeum; metapleura and mesopleura entirely, except narrow black lines along the sutures; fasciae on tergites 1-5, all interrupted at mid-dorsal line, except the second; fascia on second tergite biemarginate on anterior border, the emarginations almost enclosed; fasciae on tergites 3-5 also more or less conspicuously biemarginate on anterior dorsal border; pair of basal lateral spots on sixth tergite; sternites 1-5, except small median and pair of small, anterior lateral spots on second, and pair of anterior emarginations on fifth; legs, except more or less black at articulations of coxae and trochanters, black on femora above, and black on basal part of tibiae above; *yellow*.

The flagellum is black with a narrow, yellowish line below, becoming testaceous toward the apex. The longitudinal lines of the broken U-shaped discal mark on the scutum are tinged with reddish. The wings are hyaline. The pubescence is relatively well developed, white, and longer and more conspicuous on the head than elsewhere. The frons is wide, forming almost half of the width of the front aspect of the head. The inner eye-margins are parallel. The anterior metatarsus bears six spines. On the sixth tergite there are evident, though weakly developed, lateral ridges and the punctures on the apical half of the tergite are coarse.

The paratype differs from the type only in having an anterior, median, black area on sternites 3 and 4 and in having the lateral ridges on the sixth tergite almost obsolete.

Length 13 mm. Described from two females (type and paratype) bearing the label, "Pirapora, Minas Geraes, Brazil, November 11-13, 1919, Cornell U. Exp."

*Type*.—In the collection of Cornell University.

**BEMBIX INCOGNITA, new species**

*Type* (female).—Black: labrum; mandibles, except tips; clypeus; lower part of frons; scape, except spot above; broad anterior orbits joined by a transverse band below the anterior ocellus, and above this point deflected away from the eyes and continued to the vertex; broad posterior orbits continued at the vertex beyond the border of the eyes but not meeting; prothorax; broad lateral lines and prominent U-shaped discal mark on scutum; broad fascia on posterior border of scutellum; metanotum; broad fascia on propodeum; posterior surface, lateral angles, and sides of propodeum



almost completely; metapleura; mesopleura; mesosternum, except spot in front of middle coxa; broad fasciae occupying the middle of tergites 1-5, the first bearing a prominent median anterior emargination, the second and third each enclosing a pair of black discal spots, the fourth biemarginate on anterior border, the fifth narrowed and interrupted at mid-dorsal line; sixth tergite with broad V-shaped apical maculation; sternite two with pair of anterior lateral spots and pair of posterior lateral spots joined by a narrow apical line; sternites 3-5 with posterior lateral spots joined by apical lines; legs, except more or less black on coxae and trochanters, a black stripe above on all femora, and some black below on anterior tibiae; *yellow*.

The flagellum is ferruginous, somewhat darker above than below, especially in the case of the first two segments. The clypeus is not more prominent than normal and is only slightly carinate on midline at the base. The eyes are but slightly divergent at the clypeus. The anterior metatarsus is provided with six spines. The wings are hyaline and the left front wing bears a small triangular accessory cell between the first and second cubital cells. The pubescence is very short and sparse. The legs of the U-shaped discal mark on the scutum are distinctly reddish in color.

Length 20 mm. Described from a single female (type) bearing only the label, "Coll. Bingham." It bears no locality label whatever. In general appearance it resembles *melancholica* Smith and *taiwana* Bischoff, but the maculations are more extensively developed and are also brighter in color than on those two species.

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

#### Genus MICROBEMBEX Patton

Figures 9, 10

*Microbembex* PATTON, Bull. U. S. Geol. Surv., vol. 5, 1879, p. 364.—Fox, Proc. Acad. Nat. Sci. Phila., 1895, p. 363.—KOHLE, Ann. des K. K. Naturhist. Hofmus., vol. 11, 1896, p. 434.—PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 117.

*B. Bembexes aberantes* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893, p. 878.

*Bembex* Fox (part), Proc. Acad. Nat. Sci. Phila., 1894, p. 303.—DALLA TORRE (part), Cat. Hym., vol. 8, 1897, p. 501.

*Genotype*.—*Bembex monodonta* Say by original designation.

Members of this genus differ from those of the genus *Bembix* and other allied genera in that the distal end of the radial cell does not lie on the anterior margin of the wing (fig. 10).

Head wide as thorax; middle of vertex slightly depressed below the level of the top of the eyes; frons unusually wide, making up half,

and in some species more than half, of the total width of the front aspect of the head; anterior ocellus reduced to a linear, transverse, arcuate cicatrice; clypeus prominent, bulging, in some species, when viewed from the side, resembling a blunt nose; mandibles edentate; maxillary palpus composed of three segments, labial of one; first intercubitus straight; metacarpus at its apical end not confluent with the anterior margin of the wing; posterior-lateral angles of propodeum rounded, its posterior, dorsal, median border somewhat prominent and overhanging somewhat the slightly excavated posterior surface of the segment; second sternite of male usually provided with a more or less well developed median process; eighth sternite ending in a single spine; spatha of male genitalia as in Figure 57.

## KEY TO SPECIES OF MICROBEMBEX

1. Males (visible segments in abdomen 7; segments in antenna 13)-----2.  
Females (visible segments in abdomen 6; segments in antenna 12)-----7.
2. Seventh tergite bearing distinct lateral spines-----*bidens*.  
Seventh tergite without lateral spines-----3.
3. Hind femur near middle point distinctly widened, forming rounded obtuse angle on posterior border (fig. 49)-----*sulphurea*.  
Hind femur not thus developed-----4.
4. Seventh tergite with evident rounded lateral angles, best seen in ventral view (fig. 54)-----*tricolora*.  
Seventh tergite not so developed-----5.
5. Process on second sternite long and curved (fig. 64); clypeus, large spot on mesopleura, and large discal spots on scutum, yellow-----*aurata*.  
Process on second sternite otherwise; above combination of maculations not present-----6.
6. Process on second sternite blunt and hirsute (fig. 66)-----*hirsuta*.  
Process on second sternite otherwise-----*monodonta*.
7. Sixth tergite at base with distinct lateral spinelike angles-----*natalis*.  
Sixth tergite without basal lateral angles-----8.
8. Anterior metatarsus with eight spines-----*bidens*.  
Anterior metatarsus not with eight spines-----9.
9. Posterior apical angle of anterior metatarsus not extended in form of prominent lobe; apical emargination of clypeus ellipsoid in form (fig. 61).  
*nasuta*.  
Posterior apical angle of anterior metatarsus extended in form of prominent lobe; apical emargination of clypeus arcuate in form (fig. 9)-----10.
10. Anterior metatarsus with seven spines; second abscissa of cubital vein equal in length to second abscissa of radial; length 15 mm-----*equalis*.  
Anterior metatarsus not with seven spines; second abscissa of the cubital vein not equal in length to second abscissa of radial-----11.
11. Fasciae on tergites bicolored, yellow dorsally, pale or creamy colored laterally (Jamaica)-----*tricolora*.  
Fasciae on tergites uniform in color, yellow or pale-----12.
12. Pubescence on head, thorax, and propodeum unusually long and dense, very conspicuous on dorsum and lateral angles of propodeum-----*hirsuta*.  
Pubescence not unusually long and dense-----13.

13. Clypeus unusually prominent, the depth of its apical emargination is to the greatest width of the emargination as three is to four-----sulphurea.  
 Clypeus less prominent, depth of the apical emargination as compared with the width of the emargination not as above-----14.
14. Clypeus, scape, mesopleura, and large discal spots on scutum, yellow--aurata.  
 Combination of maculation as given above not present-----monodonta.

**MICROBEMBEX BIDENS**, new species

Figures 56-59

This species differs from all other species of the genus so far described, in that the anterior metatarsus on both males and females is provided with eight spines. The clypeus is very prominent and the depth of its apical emargination is to the width of the emargination approximately as four is to five. The maxillary palpus is composed of four segments, the labial of two. The seventh tergite of the male bears a pair of lateral apical spines and the median terminal portion is broad and emarginate at the apex (fig. 59). The male genitalia are distinct, as shown in Figure 57, and the spine on the eighth sternite bears on its ventral surface a short spine (fig. 56). The second sternite of the male near its posterior border bears a transverse, swollen area, which bears at its posterior midventral point a short, pointed tubercle. The apex of the sixth tergite of the female is deeply emarginate, causing the tergite to end in a pair of short spines (fig. 58). The pubescence on the head, thorax, and propodeum is short, relatively sparse and somewhat silvery, especially on the frons. The wings are hyaline.

*Type* (male).—Black: labrum; mandibles, except tips; clypeus, except black border at base; scape, except small spot above; anterior orbits shortened and narrowed above; spot below anterior ocellus; posterior orbits; posterior border of pronotum and of sides of prothorax, including tubercles; lateral lines broad anteriorly and pair of discal lines on scutum; fascia on scutellum greatly narrowed at midline; fascia on metanotum; broad, curved fascia on propodeum; lateral angles continuous with sides of propodeum; large spot on mesopleura; broad, continuous fasciae on the tergites (rendering the dorsum of the abdomen, when straightened, almost entirely yellow); second sternite almost wholly; continuous fasciae on sternites 3-7, narrow on the more posterior sternites; legs, except some black on coxae, trochanters, and femora above; *yellow*.

The *allotype* (female) differs in color but little from the type. There is no black on the clypeus; the posterior orbits are extended on the vertex; the fasciae on the tergites and sternites are not quite so well developed; and the black on the femora is a little more extensive.



On the type and on some of the paratypes the fascia on the first tergite incloses a pair of small, approximated, black, discal spots. On some specimens these spots are joined, forming a single median spot. Variation in the character and extent of the maculations is usually great in species of this genus, but in the case of this species, as represented by the 14 specimens at hand, variation in the maculation is very slight. All males have a black border at the base of the clypeus; this black border is lacking on all females. On the females the discal marks on the scutum are broad and on some these marks assume a broken U-shaped form.

Length 14 mm. Described from seven males and seven females (including the type and allotype), of which 13 bear the label, "La Rioja, W. Argentina, B. P. Clark, donor." The remaining specimen, a female, bears the label, "Pie de Palo, San Juan, Argentina, 11 March, 1920, Cornell U. Expedition."

*Type and allotype*.—Cat. No. 40851, U.S.N.M.

MICROBEMBEX SULPHUREA (Spinola)

Figures 49, 50

*Bembex sulphurea* SPINOLA, Gay's Hist. Fis. y Polit. de Chile, vol. 6, 1853, p. 319.

*Bembex sulfurea* HANDLIRSCH, Stiz. Akad. Wissensch. Wien, Math. Nat. Cl., vol. 102, 1893, p. 885.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 514.

The males of this species have the hind femora dilated at the middle point (fig. 49), a character that, so far as I am aware, is not possessed by any other species of the genus. Furthermore, the spine of the eighth sternite has a distinct hook at the tip, as is shown in Figure 50. Apparently Handlirsch overlooked this in his description of the species. The females (and males also) have the clypeus strongly prominent so that its junction with the frons at the midline forms an angle more nearly approaching a right angle than on any other species except *nasuta*. The apical emargination of the clypeus for the junction with the labrum is greater than a semicircle, so that the depth of the emargination compared with its extreme width is approximately as 3 is to 4. The size of the individuals, the color of the maculations, and the extent of their development all vary greatly.

Among the specimens of this species before me are two males, identified by Handlirsch and bearing the label, "Oberer Magdalenen, Strom"; a male identified by Kohl and bearing the label, "Chile, Concepcion, 1903, Herbst"; a female identified by Handlirsch and bearing the label, "Brasilien"; and a female identified by Reed and bearing the label, "Chile, E. C. Reed." In addition to these I have

referred to this species a male from southern Chile, collected by M. J. Rivera, and females collected at Rio Janeiro, Bogata, Cayenne, and La Paz, Bolivia.

MICROBEMBEX TRICOSA, new species

Figures 53-55

This species is based upon specimens from Jamaica. The male is distinguished by the evident rounded lateral angles of the seventh tergite, which give to the apex of the tergite a distinct triangular outline (fig. 54). The spine of the eighth sternite is flattened, straight, and truncate at the apex. On the female the fasciae on the tergites are of two colors: the dorsal median portion is yellow or greenish yellow, while the lateral parts are creamy yellow or pale. The pubescence on the frons of the female is silvery on the lower part and on the areas bordering the eyes, but that on the upper central part shows a decided golden tinge. The pubescence on the frons of the male is distinctly golden.

*Type* (male).—Black: labrum; clypeus; mandibles except tips; scape below; vestiges of posterior orbits; central spot on dorsum of prothorax united with a line on posterior border of pronotum that is continuous on tubercles and sides of prothorax; lateral lines and pair of large discal spots on scutum; large lateral spots showing a tendency to elongate along the anterior border of scutellum; metanotum; broad, curved fascia on propodeum narrowed at midline; large triangular spot on mesopleura; broad fasciae occupying almost the entire surface of tergites 1-6; fascia on second tergite inclosing pair of small, widely separated discal spots; fasciae on tergites 3-6 with widely separated, more or less evident biemarginations and median notch on anterior border; pair of lateral apical spots on tergite 7; broad fascia on sternite 2; broad fascia on sternite 3 deeply biemarginate on anterior border; lateral spots on sternites 4-6 connected by posterior apical lines; coxae and trochanters more or less; femora, except more or less of the basal half of all; tibiae, except spot below on all; and tarsi; *yellow*.

The maculations on the *allotype* (female) do not differ essentially from those on the type, except on the abdomen. The fasciae on the tergites of the allotype are bicolored, as has been noted above, and are much narrower than those on the type. While they are somewhat sinuate on the anterior border, they are not emarginate and all are without discal spots. The fifth is interrupted. The sixth tergite bears apical lateral spots. There are lateral spots on sternites 2-5, of which those on 2-4 are connected by narrow, apical lines. The black on the legs is somewhat more extensive than on the type. The sixth tergite ends in two short spines (fig. 53).

The wings of this species are somewhat infumated, the infumation being more evident on the middle of the wing than elsewhere, more evident on the female than on the male, and more conspicuous on some individuals than on others. The anterior metatarsus is provided with six spines. The variation in the maculations, as shown by the specimens before me, is not great. On two of the male paratypes the fascia on the first tergite also incloses a pair of discal spots, and on a female paratype the fasciae on both fourth and fifth tergites are interrupted. On all other female paratypes all fasciae on the tergites are continuous.

Cresson described two species in this genus from specimens obtained from Cuba, *argentifrons* and *armata*. I have seen the specimens on which these two species are based and I am of the opinion that *argentifrons* is only a form of *monodonta* Say. The male that Cresson referred to his *armata* represents, in my judgment, a distinct species, but whether this male and the female with which he associated it are sexes of the same species is open to question. The female (which Cresson made the type of *armata*) does not have the golden pubescence on the frons that is so conspicuous on the male of *armata*, but it does have the mixed silvery and golden pubescence such as is found on the frons of the species I have just described. Furthermore, I have before me a single female from Cuba that does have the golden pubescence on the frons in all respects similar to that of the male of Cresson's *armata*. If further investigation shall show that the female of *armata* Cresson and the female of the species above described belong to the same species, my species will fall as a synonym under *armata* Cresson and a new species will have to be described, based upon the male of Cresson's *armata*. In this connection I wish to state that there is one thing of which I am certain: that is that the male of *tricosa* is distinct from the males that Cresson referred to *armata* and *argentifrons*.

Length 12 mm. Described from five males and six females, including the type and allotype, all from Jamaica.

*Type*.—Cat. No. 40852, U.S.N.M.

MICROBEMBEX AURATA Parker

Figure 64

*Microbembex aurata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 121.

This species differs from *monodonta* in its slightly larger size, in its more extensive and richer yellow maculations, and particularly in the character of the genital stipites of the male. Only three specimens are found in the United States National Museum: the type,



bearing the label, "California"; the allotype, bearing the label "Los Angeles Co., California"; and a male bearing the label, "Bill Wms. Fork, Ariz., Aug., F. H. Snow."

**MICROBEMBEX HIRSUTA Parker**

Figure 66

*Microbembex hirsuta* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 122.

The male of this species may be distinguished from the male of *monodonta* by the form and the hirsute character of the process on the second sternite. It is further distinguished from *monodonta* by the form of the genital stipites. The females are distinguished from the female of *monodonta* by the unusual development of the pubescence on the head, thorax, and propodeum, especially on the dorsum of the propodeum. On many of the females that I have referred to this species the black on the abdomen has been replaced by brown of varying shades. These brown forms are believed to be specimens that were captured just after emergence from the pupal condition.

SPECIMENS EXAMINED.

ARIZONA: Yuma (August, 1905, Hbt. Brown).

CALIFORNIA: Bard (July 22, H. R. Reed).

TEXAS: Rio Grande, near Boquillas, Brewster County (June, 1908, Mitchell and Cushman).

**MICROBEMBEX MONODONTA (Say)**

Figures 9, 10, 65

*Bembex monodonta* SAY, Nar. Exp. St. Peters River, Append., 1824, p. 335.—  
HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 102, 1893,  
p. 882.

*Microbembex monodonta* PATTON, Bull. U. S. Geol. Surv., vol. 5, 1879, p. 362.—  
PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, pp. 119, 134.

*Microbembex tarsalis* ROHWER, Proc. U. S. Nat. Mus., vol. 47, 1914, p. 516.

This seems to be the most widely distributed species among the Bembicids of the western continent. It has been reported from practically every State in North and South America. Among the hundreds of specimens I have examined, representing localities widely distributed over both North and South America, I find great variation in the color of the maculations, in the extent to which these maculations are developed, and their distribution on the body. So far, I have been unable to find any structural variations to correspond to these color variations, and, in fact, no consistency in the color variations themselves. I am, therefore, obliged to consider this large

group as a single species, since I am unable to discover trustworthy characters, based either on structure or color, that will enable me to separate it into two or more species or even into well-defined varieties.

MICROBEMBEX NATALIS, new species

Figures 51, 52

*Type* (female).—Black: clypeus; labrum; mandibles, except tips; area on frons between antennae extended upward and narrowed to a point connecting it with a spot below anterior ocellus; scape below; broad anterior orbits deflected inward above anterior ocellus; posterior orbits very broad below, narrowed above and extended across the vertex a short distance, but not united; prothorax, except transverse spot above and vertical spot on side; lateral lines, and a U-shaped spot whose anterior ends are much dilated, on scutum; fascia, enlarged somewhat laterally, on posterior border of scutellum; fascia on metanotum; broad fascia on propodeum and its lateral angles broadly; metapleura; mesopleura almost wholly; very broad fascia on first tergite enclosing a pair of kidney-shaped discal marks whose concave sides face laterally and whose anterior ends are further separated than their posterior ends; broad, continuous fasciae on tergites 2—5, whose margins are slightly sinuate; apex of sixth tergite broadly; broad lateral spots joined by a narrow apical fascia on sternites 2 and 3; lateral spots on sternites 4 and 5 prolonged toward the midline but not connected; coxae and trochanters in part; femora, except line above on all; tibiae, except line below on first and second pairs and line above on third pair; and tarsi; *yellow*.

The flagella are broken, only a portion of the base of one remains. This is black above and rusty brown below. The wings are hyaline. The clypeus is remarkably flat for a member of this genus, showing scarcely any of the prominence so evident in *monodonta*. The pubescence is white and remarkably short and sparse. The sixth tergite bears basally well-defined lateral angles, which, owing to the curvature of the tergite, point almost directly downward. This tergite ends in a pair of well-defined points.

It is just possible that the specimen on which this species is based may belong to Smith's *gratiosa*, but if Smith's description of his species is complete and accurate, it does not belong there. Furthermore, Handlirsch, who gives a figure of his species, *uruguayensis*, says that the abdomen of the female of *gratiosa* is quite similar to that of *uruguayensis*. If his conclusions are correct, this female represents a good species, for the sixth tergite is quite different from that of *uruguayensis* as represented in the figure given by Handlirsch.

Length 13 mm. Described from a single female bearing the label, "Natal, Brazil, W. M. Mann."

*Type*.—Cat. No. 40853, U.S.N.M.

MICROBEMBEX NASUTA, new species

Figures 60, 61

This species is described from two females and is distinguished from all other species in the genus by the peculiar form of the clypeus, as shown in Figures 60 and 61. It is unusually prominent and bulging, the depth of its apical emargination for articulation with the labrum being approximately equal to the greatest width of this emargination. The species is further distinguished by the fact that the posterior apical angle of the anterior metatarsus is not produced into a prominent lobe, a development found on all other species of the genus.

*Type* (female).—Black: mandibles, except tips; clypeus; labrum; scape; frons between antennae; spot on frons below anterior ocellus; very broad anterior orbits, not reaching the vertex and dilated inward at their dorsal extremity; very broad posterior orbits, almost united across the vertex; prothorax; broad, lateral lines and pair of broad, discal lines on scutum; scutellum, except median longitudinal black stripe; metanotum; very broad, curved fascia on propodeum; lateral angle, posterior surface, and sides of propodeum; metapleura; mesopleura and mesosternum; all tergites; sternites entirely, except narrow, black anterior border on fifth and sixth: legs entirely; *pale, almost clay-colored yellow*. On the anterior sternites the color is a more decided yellow.

The flagellum is dark above, almost black on some segments; below it is a light shade of ferruginous. The wings are hyaline and long, reaching the end of the abdomen. The pubescence is white, and although dense, is exceedingly short. The apex of the sixth tergite is slightly and roundly emarginate.

The paratype differs from the type in being a trifle larger and in having the yellow on the tergites somewhat less extensive. The fascia on the first tergite bears a median anterior emargination; that on the second has a pair of shallow, rectangular anterior emarginations; and tergites 3, 4, and 5 each shows an irregular, shallow black border on anterior margin, variable in outline. Tergite 6 shows an anterior black border. The basal joints of the legs also show dark markings, not being wholly yellow as on the type.

Length 15–17 mm. The type bears the label, "Pie de Palo, San Juan, 11 March, 1920, Argentine, Cornell U. Expedition." The paratype bears the label, "Argentina, Mendoza, 22. 12. 1906, Jensen Haarup V."



*Type*.—In the collection of Cornell University; paratype in the Zoologisches Museum der Universität, Berlin.

**MICROBEMBEX EQUALIS, new species**

Figures 62, 63

*Type* (female).—Black: labrum; mandibles, except tips; clypeus, except black basal band, emarginate at apical middle; scape below; trace of anterior orbits opposite sides of clypeus; posterior orbits; narrow posterior border of pronotum; tubercles; small spot on side of prothorax; short lateral lines above base of wings on scutum; small lateral spots on scutellum; fascia on metanotum; curved fascia on dorsum and posterior surface of propodeum; spot on ventral border of mesopleura; broad, continuous fascia on tergites 1–6, the anterior borders being slightly irregular and acutely emarginate at dorsal midline; continuous apical fasciae on sternites 2–6, somewhat enlarged at lateral extremities and also at midventral line; spot on coxae variable in extent; distal part of femora varying in extent on the different pairs; tibiae, except spot below on anterior and middle pairs; and tarsi; *light greenish yellow or pale creamy white*. The fasciae on the tergites, except their extreme anterior borders, are almost white, while the shade of yellow on the tibiae and tarsi is deeper than elsewhere on the body.

The frons is very wide and the inner eye-margins are parallel. The flagella are black. The clypeus is prominent, in this respect agreeing with *monodonta*. The pubescence is dense, white, and of normal length, being longest on head, sides of thorax and lateral angles of propodeum. When viewed at the proper angle the pubescence appears silvery, especially on frons and clypeus. The anterior metatarsus bears seven spines, of which the four on the distal portion are large and black in color, while the three on the proximal part are much smaller in size and are light in color. The second abscissa of the radius and the second abscissa of the cubitus are equal in length, whereas in other species the second abscissa of the radius is appreciably longer than the second abscissa of the cubitus. The sixth tergite ends in two distinct points (fig. 63).

Length 15 mm. Described from a single female bearing the label, "Tingo, Peru, Aug. 17 (Cockerell)."

*Type* (male).—Cat. No. 40854, U.S.N.M.

**Genus BICYRTEs Lepelletier**

Figures 15, 16, 40

*Bembex* OLIVIER (part), *Encycl. Meth.*, vol. 4, 1789, p. 288.

*Monedula* DAHLBOM (part), *Hym. Eur.*, vol. 1, 1845, p. 492.

*Bicyrtes* LEPELETIER, Hist. Nat., vol. 3, 1845, p. 53.—PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 56.

Genotype: *Bicyrtes (servitii) ventralis* SAY. Monobasic.

*Bembidula* BURMEISTER, Bol. Acad. Cordova, vol. 1, 1874, p. 122.—HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 473.—KÖHL, Ann. des K. K. Naturhist. Hofmus., vol. 11, 1896, p. 442.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 494.

Genotype: *Monodula discisa* TASCHEMBERG. Designated by Parker in 1917.

Members of this genus are distinguished from those of other genera of the tribe by the peculiar form of the propodeum, whose posterior surface is distinctly concave and whose posterior-lateral angles (except in a single species) are extended, compressed, and wedgelike. The anterior ocellus is reduced to a transverse, linear, arcuate cicatrice and the eighth sternite of the male ends in three points.

Head wide as thorax; vertex on a level with the top of the eyes, the middle part being slightly above this level; anterior ocellus completely reduced to a linear, transverse, arcuate cicatrice; inner eye-margins somewhat divergent at the vertex; mandibles dentate; clypeus broad and only moderately arched; labrum about as long as broad at the base, its apex rounded, not emarginate; maxillary palpus composed of six segments, labial of four; posterior surface of propodeum concave, its posterior-lateral angles (except in a single species) extended, compressed, and wedgelike; second cubital cell strongly narrowed on the radial vein; pubescence always short, practically wanting on the abdomen; second sternite of male may or may not bear a process; eighth sternite of male ending in three spines; spatha of male genitalia as in Figure 40.

KEY TO THE SPECIES OF BICYRTES

1. Males (abdomen with 7 visible segments; antenna with 13 segments).....2.  
Females (abdomen with 6 visible segments; antenna with 12 segments).....22.
2. Posterior coxa with tooth on inner distal margin.....fodiens.  
Posterior coxa without tooth.....3.
3. Middle femur with tooth at base below.....4.  
Middle femur without tooth at base below.....5.
4. Ultimate tergite black; fasciae on tergites narrow.....ventralis.  
Ultimate tergite maculated; fasciae on tergites broader.....parata.
5. Anterior tarsus greatly dilated; segments broad and flat.....odontophora.  
Anterior tarsus normal; segments not broad and flat.....6.
6. Fifth segment of the flagellum wider than any other segment; apical segment of all tarsi wholly or in part black.....discisa.  
Fifth segment of flagellum not widened; apical segment of tarsi otherwise.....7.
7. Second sternite with distinct median process or tubercle.....tricolorata.  
Second sternite without process or tubercle.....8.
8. Mesopleura more or less conspicuously maculated.....9.  
Mesopleura black.....13.

9. Anterior wing heavily clouded at first cubital cell.....*viduata*.  
Anterior wing without heavily clouded area.....10.
10. Fasciae on tergites attenuated medially; that on sixth reduced to widely separated spots.....*quadrifasciata*.  
Fasciae not attenuated medially; that on sixth tergite not reduced to widely separated spots.....11.
11. Fascia on posterior border of scutellum continuous, or if interrupted, the lateral spots show a tendency to extend along the posterior border; genital stipes as in Figure 221.....*annulata*.  
Fascia on anterior border of scutellum continuous, or if interrupted, the lateral spots show a tendency to extend along the anterior border; genital stipes otherwise.....12.
12. Discal marks on scutum narrow longitudinal lines; sides of thorax profusely yellow; genital stipes as in Figure 45.....*variegata*.  
Discal marks on scutum oval spots; yellow on side limited to spot on mesopleura; stipes otherwise.....*spinosa*.
13. Anterior wings heavily clouded at first cubital cell.....14.  
Anterior wings without clouded area; infumation, if present, diffused.....15.
14. Dorsum of propodeum unmarked; genital stipes as in Figure 48.....*gracilis*.  
Dorsum of propodeum marked with yellow fascia more or less complete; genital stipes as in Figure 47.....*viduata*.
15. Flagellum black; fascia on sixth tergite wanting or more widely interrupted than preceding fasciae.....16.  
Flagellum not wholly black; fascia on sixth tergite always developed and scarcely more widely interrupted than the other fasciae.....19.
16. Sternites without maculations.....18.  
Sternites 2-4 with lateral maculations.....17.
17. Discal spots on scutum; fascia on metanotum; fasciae on tergites, orange yellow.....*spinosa*.  
Discal spots on scutum lacking; metanotum without fascia; fasciae on tergites creamy white.....*quadrifasciata*.
18. Tergites 1-5 maculated; wings slightly but uniformly infumated.  
*quinquemaculata*.  
Tergites 1-4 maculated; wings hyaline.....*pullata*.
19. Scape, first two joints of flagellum, and legs ferruginous; genital stipes as in Figure 46.....*insidiatrix*.  
Scape and first two joints of flagellum not entirely ferruginous; legs black and yellow, or black and ferruginous; genital stripes otherwise.....20.
20. Metanotum without fascia; fasciae on tergites narrow; ultimate tergite narrowed and bluntly pointed at the apex.....*tristis*.  
Fascia on metanotum; fasciae on tergites relatively broad; ultimate tergite otherwise.....21.
21. Legs black and ferruginous; maculations deep yellow, frequently with dashes of ferruginous.....*capnoptera*.  
Legs black and yellow; markings pale creamy yellow with no trace of ferruginous.....*mesillensis*.
22. Second sternite bearing pair of small processes; sixth tergite as in Figure 41.  
*bradleyi*.  
Second sternite without process; sixth tergite otherwise.....23.
23. Posterior coxa with tooth on inner distal margin.....24.  
Posterior coxa without tooth.....25.



24. Fasciae on tergites narrow; ultimate tergite black.....fodiens.  
 Fasciae on tergites broad; ultimate tergite yellow.....burmeisteri.
25. Ultimate tergite with pygidial area and lateral ridges, sometimes weakly developed.....26.  
 Ultimate tergite without pygidial area and lateral ridges.....28.
26. Scutum without discal marks; mesopleura black, rarely with inconspicuous maculation; fasciae on tergites interrupted medially.....27.  
 Scutum with discal markings; mesopleura with evident yellow maculation; fasciae on tergites usually continuous.....annulata.
27. Fasciae on posterior tergites shortened or narrowed laterally; sixth tergite black.....capnoptera.  
 Fasciae on posterior tergites not shortened or narrowed laterally; sixth tergite with pair of small maculations.....pexa.
28. Lateral angles of propodeum acuminate; all fasciae on tergites continuous. angulata.  
 Lateral angles of propodeum normal form; not all fasciae on tergites continuous.....29.
29. Mesopleura black.....30.  
 Mesopleura maculated with yellow more or less.....32.
30. Flagellum and legs for the most part ferruginous; apex of ultimate tergite ferruginous; fascia on first tergite broad and best developed...insidiatrix.  
 Flagellum black; legs black and yellow or black and ferruginous; ultimate tergite not ferruginous; fascia on first tergite narrow, not better developed than the others.....31.
31. Ultimate tergite maculated.....parata.  
 Ultimate tergite black.....ventralis.
32. Ultimate tergite wholly yellow.....sola.  
 Ultimate tergite black.....33.  
 Ultimate tergite with lateral maculations.....37.
33. Anterior wing clouded at first cubital cell.....viduata.  
 Anterior wing not clouded at first cubital cell.....34.
34. Fascia on fifth tergite much more widely interrupted than that on the first, or it may be lacking; discal marks on scutum lacking or reduced to narrow lines.....quadrifasciata.  
 Fascia on fifth tergite always present and scarcely more widely interrupted than that on first; discal marks on scutum prominent spots.....35.
35. Lateral spots on scutellum tending to extend themselves along the anterior border of the sclerite; fasciae on tergites orange yellow.....spinosa.  
 Lateral spots on scutellum tending to extend themselves along the posterior border of the sclerite; fasciae on tergites creamy yellow.....36.
36. Tibiae marked with black.....discisa.  
 Tibiae wholly yellow.....mendica.
37. Fasciae on all tergites interrupted.....38.  
 Fasciae, one or more, continuous.....parata.
38. Scutum without discal markings.....mesillensis.  
 Scutum with pair of discal lines or spots.....39.
39. Fascia on anterior border of scutellum usually narrowly interrupted at midline.....variegata.  
 Fascia on scutellum reduced to lateral spots that tend to extend themselves along the posterior border of the scutellum.....discisa.

## BICYRTES FODIENS (Handlirsch)

Figure 38

*Bembidula fodiens* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 497.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 495.

*Bicyrtes fodiens* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 60.

This species and the one following (*burmeisteri*) are distinguished from all others of the genus known to me by the presence of a tooth on the inner apical margin of the posterior coxa. The female of this species may be distinguished from the female of *burmeisteri* by the color of the sixth tergite, which is black on *fodiens* and yellow on *burmeisteri*. The form of the sixth tergite is shown in Figure 38.

## SPECIMENS EXAMINED

GEORGIA: Spring Creek, Decatur County (July 16, 1912).

LOUISIANA: East Point (September 5, 1907, F. C. Bishopp); New Orleans (Ed Foster).

MISSISSIPPI: Utica (Ashmead).

MISSOURI: St. Louis (Rau).

TEXAS: Calvert (June 27, 1907, F. C. Bishopp).

## BICYRTES BURMEISTERI (Handlirsch)

*Bembidula burmeisteri* HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 98, 1889, p. 500.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 494.

*Bicyrtes burmeisteri* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 62.

I have before me three females that I have referred to this species, all of which vary somewhat from Handlirsch's description of the species. But, since the original description was made from a single specimen, some variation from the description is to be expected. No specimen has any maculation on the mesopleura. All have narrow apical fasciae joining the lateral spots on the sternites. One (from Texas) has the scape wholly yellow. Of the other two (from Mexico) one has a well-developed, curved fascia on the propodeum, while the other has no trace of such a fascia. The specimen from Texas and one of the two from Mexico have conspicuous lateral spots and a pair of small discal spots on the first tergite, whereas the second one from Mexico has the first tergite wholly black. This specimen and the one from Texas have the wings but slightly infumated but the other Mexican specimen has the wings almost as heavily infumated as are the wings of *fodiens*. So far as I am aware, the male of this species has not been described.

## SPECIMENS EXAMINED

MEXICO: Guadalajara (July 5, 1903, McClendon).

TEXAS: Brownsville (September 29, 1906, J. C. Crawford).

## BICYRTE VENTRALIS (Say)

Figure 16

*Monedula ventralis* SAY, Exp. St. Peters River, vol. 2, 1824, p. 336.*Bicyrtes servillii* LEPELETIER, Hist. Nat., vol. 3, 1845, p. 63.*Bembidula ventralis* HANDLIERSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 495.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 496.*Bicyrtes ventralis* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 62.

This is the most abundant species of the genus in North America and is widely distributed over the United States and Canada. In the western part of the United States it is largely replaced by *parata*. The males of these two species are the only ones that have the middle femur provided with a distinct tooth near the proximal end below. Along with the wide dispersal of *ventralis* goes a wide variation in the extent and color of the maculations, and this variation holds true for both males and females. The color varies from orange yellow through lighter shades to light creamy white. My observations on this species seem to indicate that in the western part of its range it appears only in the light-colored forms. The wings are infumated, but the degree of infumation also varies.

## BICYRTE PARATA (Provancher)

*Monedula parata* PROVANCHER, Add. Hym. Quebec, 1888, p. 416.*Bembidula parata* FOX, Proc. Acad. Sci. Phila., 1895, p. 353.*Bembidula meliloti* ROHWER, Ent. News, vol. 19, 1908, p. 376.*Bicyrtes parata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 64.

This is a western species and as now recognized appears under two forms, one in which both males and females have the maculations yellow and the other in which both males and females have the maculations white. As was pointed out in the notes on *ventralis*, that species and this one, in regard to the male, are characterized by the presence of a tooth on the middle femur. Furthermore, the antennae of the males of these two species have the same modifications. The male genitalia of the two species show no trustworthy differences. Even the infumation of the wings can not be relied upon to separate the two species. It follows, therefore, that we must depend upon the maculations, upon their extent and their color, for characters with which to separate the two species.

On typical forms of *parata* the color of the maculations is yellow, the fasciae on the tergites are broad, either all narrowly interrupted or some interrupted and some continuous. In addition, the sixth tergite of the female and the seventh of the male bear conspicuous lateral spots. In typical forms of *ventralis* the fasciae on the tergites are always interrupted, relatively narrow, and the fascia on the first tergite is much reduced or wanting. The sixth tergite of the female and the



seventh of the male are invariably black. Unfortunately, all specimens are not typical, and it is these nontypical forms that cause the difficulty in identification. The white forms of *parata* might be considered a distinct species were it not for the fact that there is an intermediate series passing by gradations over to the yellow form of *parata* on the one side and another series passing likewise over to *ventralis* on the other side. Much more work must be done in the field before the problem here presented can be solved in a satisfactory manner.

## SPECIMENS EXAMINED

CALIFORNIA: Los Angeles County (September, Coquillet); San Bernardino County (May, Coquillet).

NEW MEXICO: Pecos (September 2, Cockerell).

TEXAS: Round Mountain (Coquillet).

WASHINGTON: Spokane (July 7, 1924, J. M. Aldrich).

The species has also been reported from Utah and Arizona.

## BICYRTES ODONTOPHORA (Handlirsch)

## Figure 36

*Bembidula odontophora* HANDLIRSCH, Sitz. Akad. Wissensch, Wien, Math.-Nat. Cl., vol. 98, 1889, p. 482.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 495.

The male of this species can not be confused with that of any other species known to me. The dilated and flattened segments of the anterior tarsus give to the males of this species a character unique in the genus. Handlirsch separates the females of this species from those of *discisa*, which most closely resemble it, chiefly on the character of the punctation of the scutellum, which is much finer than on *discisa*. This character, unless both species are available for comparison, is difficult to use. I have before me a single female that I have referred to this species. The discal maculations on the scutum are lines and the lateral spots on the scutellum are approximately rectangular, whereas the corresponding maculations on *discisa* are really spots on the scutum and triangular spots on the scutellum. The female of *mendica* is distinguished from both *discisa* and *odontophora* by having the tibiae and the tarsi entirely yellow.

## SPECIMENS EXAMINED

BOLIVIA: Near mouth of Rio Maxiri (September, W. M. Mann).

PERU: Puerto Bermudez (Cornell University Expedition).

VENEZUELA: Rio Moto, Cuara District (October, 1909, M. A. Carricker).

The female referred to this species bears the label, "Furo de Resaco, 10 Sept., night. Cornell Univ. Exped." The specimens on which Handlirsch based his description of the species were from Peru.

## BICYRTES DISCISA (Taschenberg)

Figure 43

*Monedula discisa* TASCHENBERG, Zeitschr. f. d. ges. Nat., vol. 36, 1870, p. 26.  
*Bembidula discisa* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl.,  
 vol. 98, 1889, p. 485.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 495.

The males of this species (and of *odontophora*) have the fifth segment of the flagellum distinctly wider than any other segment in it. In both species the males have the second sternite with an evident process, but *discisa* differs from *odontophora* in having the anterior tarsus of normal form, in having the posterior border of the middle femur plain, and in having the apical segment of all tarsi entirely or in part black. The fasciae on the tergites of both sexes of *discisa* are almost white and are narrow, narrower than those on *spinosa* and much narrower than those on *variegata*.

## SPECIMENS EXAMINED

ARGENTINA: Carcarana (Brunner); Porterillos, Mendoza (March 18–20, 1920, Cornell University Expedition).

BOLIVA: Cavinás, Rio Beni (January, 1922, W. M. Mann); Reyer (October 1921, W. M. Mann); Huachi Beni (September, 1921, Mann).

BRAZIL: Chapada; Itapura, Matto Grosso (December 8, 1919, Cornell University Expedition); Manaus (Mann and Baker); Natal (Mann); Para (Miss H. B. Merrill); Parintins (September 27, 1919, Parish).

COSTA RICA: San Carlos (Schild and Bergdorf).

PARAGUAY: Sapucay (March 12, 1902).

PERU: La Chorera to La Sombra, Putumayo District (August 21, 1920, Cornell University Expedition); Palcazu (Rosenberg).

VENEZUELA: Rio Moto, Cuara District (October 9, M. A. Carricker).

Handlirsch reports this species also from Mexico, Surinam, and Uruguay.

## BICYRTES TRICOLORATA, new species

Figure 40

*Type* (male).—The maculations on this insect are an unusual combination or fusion of yellow and ferruginous. As distinct from the black ground color the maculations are as follows: labrum; mandibles, except tips; clypeus, except narrow basal border; frons between and below insertion of antennae, except median apical spot; scape and first four segments of flagellum; anterior orbits shortened above; narrow posterior orbits; posterior border of pronotum; side of prothorax, including tubercle; broad, shortened lateral lines on scutum; fascia on posterior border of scutellum interrupted medially; fascia on metanotum; curved fascia on dorsum of propodeum

extended in two points on its posterior surface; posterior lateral angles broadly and vertical anterior line on side of propodeum; metapleura; very large spot on mesopleura enclosing black spot below and prolonged on mesosternum; broad, continuous fasciae on tergites 1-6, those on tergites 2 and 3 narrower on the disk than on the sides of the tergites and notched at dorsal midline; apex of seventh broadly; sternites, except median longitudinal spot on second and basal border more or less on others; legs, except black spots on coxae and trochanters and dark line below on middle and posterior femora. The labrum and the tarsi are yellow; the tibiae are largely yellow; the fasciae on the tergites are a combination of yellow and ferruginous; elsewhere the maculations are either ferruginous or a fusion of yellow and ferruginous.

The antenna is relatively heavy and stout, but aside from color it presents no specific characters. The tegula, the base of the wings and the veins are ferruginous in color and the infumation of the wings is slight and uniform. The second sternite bears a well-developed median, rounded, bluntly-pointed process situated about midway between the basal and apical borders of the sternite. The pubescence on head and thorax is white and short and on the clypeus and lower part of the frons it is silvery. On the abdomen the pubescence has a golden luster and on the seventh sternite it is unusually long and abundant.

Length 18 mm. Described from a single male bearing the No. 3782 and the label, "America Merid."

*Type*.—In the Zoologisches Museum der Universitat, Berlin.

#### BICYRTE VIDUATA (Handlirsch)

##### Figure 47

*Bembidula viduata* HANDLIRSH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 491.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 496.

*Bicyrtes viduata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 69.

This species may be distinguished, both males and females, from all others, except *gracilis*, by the presence of the heavily infumated area (including the first cubital cell) on the anterior wing. It is distinguished from *gracilis* by its more extensive maculations and by the character of the male genitalia.

I have before me of this species eight males and four females, collected by Mitchell and Cushman at Chisos Mountain, Brewster County, Tex., June 10-12, 1908. I have also a female collected by C. F. Baker, labelled "Mexico," and a male that bears the label "San Rafael, Jicoltepec." The localities from which were collected the



two females on which Handlirsch based his description of the species is likewise indefinite.

BICYRTE QUADRIFASCIATA (Say)

Figures 15, 44

*Monedula quadrifasciata* SAY, Exp. St. Peters River, vol. 2, 1824, p. 336.

*Bembidula quadrifasciata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 492.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 496.

*Bembidula variegata* FOX, Proc. Acad. Nat. Sci. Phila., 1895, p. 353.

*Bicyrtes quadrifasciata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 65.

This is one of the largest and most easily recognized species in the United States, over the eastern part of which it is widely distributed. It is replaced in Mexico, Central and South America by *variegata*, from which the most elaborately maculated forms of this species can with difficulty be distinguished. The males of the two species can usually be distinguished by the fact that *quadrifasciata* has the scutum black or with weakly developed discal marks and has the fascia on the sixth tergite widely separated or reduced to lateral spots, whereas *variegata* has well-developed discal lines on the scutum and has the fascia on the sixth tergite broad and no more widely interrupted than are the fasciae on the other tergites. In case of doubt the genitalia must be considered. In the case of the female the sixth tergite of *quadrifasciata* is black; of *variegata*, *maculated*.

SPECIMENS EXAMINED

ALABAMA: (C. F. Baker).

CONNECTICUT: Sheffield Island (August 16, 1901, J. L. Zabriskie).

FLORIDA: Crescent City (April 24, 1908, Van Duzee); Enterprise (May 1).

GEORGIA: Okefenokee Swamp, Billy's Island (June 12, 1912); Stone Mountain (August 3, 1913).

ILLINOIS.

INDIANA.

IOWA: Ames.

MARYLAND: Great Falls (July 17, 1915, J. B. Parker).

MASSACHUSETTS: Amherst (July 28, 1905).

NEW MEXICO: Albuquerque (Ashmead).

NEW YORK: Long Island (Ashmead).

OHIO: Cedar Point, Sandusky (July 23, 1913, J. B. Parker).

PENNSYLVANIA: Philadelphia (Skinner).

SOUTH CAROLINA: Calhoun (E. S. G. Titus).

TEXAS: Columbus; Mineola (June 26, 1906, E. C. Bishopp); Rosser (June 7, 1905, F. C. Bishopp); San Antonia (Ashmead).

VIRGINIA: Norfolk (July 15, 1910, F. A. Johnston).

WISCONSIN: N. Hudson, St. Croix County (July 7, 1910); Genoa (July 12, 1911).

The species has been reported also from Kansas and New Jersey.

## BICYRTE ANNULATA Parker

## Figure 221

*Bicyrtes annulata* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 67.

This species stands close to *capnoptera* Handlirsch, the female having the sixth tergite provided with a well-developed pygidial area set off by distinct lateral ridges. It differs from *capnoptera* in having mesopleural maculations, in the greater clearness of the wings, and in the more extensive development of the abdominal fasciae. The type of this species is a female in the collection of the University of Kansas. In a paragraph following the original description of this species the type is referred to as a male. This was an error that I take the opportunity here to correct.

## SPECIMENS EXAMINED

ARIZONA.

CALIFORNIA: Bard (June 15, 1920, H. R. Reed).

NEW MEXICO: Albuquerque (Ashmead); Mesilla Park (September 18, 1899, Cockerell).

TEXAS: Chisos Mountains, Brewster County (June 10-12, 1908, Mitchell and Cushman); Columbus; El Paso (August 21, 1908, F. C. Pratt).

## BICYRTE VARIEGATA (Olivier)

## Figure 45

*Bembex variegata* OLIVIER, Enc. Meth., vol. 4, 1789, p. 292.

*Bembidula variegata* HANDLIRSCH, Sitz. Akad. Wissensch, Wien, Math.-Nat. Cl., vol. 98, 1889, p. 488.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 496.

As has been pointed out above, this species is closely related to *quadrifasciata*. The characters, by means of which the two species may be distinguished, are set forth in the discussion of that species.

## SPECIMENS EXAMINED

BOLIVIA: Rurrenabaque, Rio Beni (October, Lopez).

BRAZIL: Chapada (March); Pernambuco (December 8, 1882); Manaus (Miss H. B. Merrill).

BRITISH GUIANA: Bartica (May 10, 1901).

CHILE: Santiago (1923, Father Claude Joseph).

ECUADOR: Guayaquil; Posoria.

GUATEMALA: Livingston (April 18, 1923, E. G. Smyth).

MEXICO: Jicaltepec; Mazatlan; San Juan Bantista.

PARAGUAY: Sapucay (December 17, 1902).

VENEZUELA: Rio Moto, Cuara District (October, 1909, M. A. Carricker).

WEST INDIES: St. Vincent.

Handlirsch reports this species also from Cayenne and Peru.

## BICYRTES SPINOSA (Fabricius)

Figure 37

*Bembex spinosa* FABRICIUS, Ent. Syst., vol. 4, 1794, p. 458.*Bembidula spinosa* HANDLIRSCH, Sitz Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 487.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 495.

This species bears some resemblance to *variegata*. The discal marks on the scutum, however, are distinctive, being relatively very short and very broad, either oval in outline or triangular, in which case the anterior end of the discal mark forms the base of the triangle. The triangular lateral spots on the scutellum show a tendency to elongate along the anterior border of the sclerite. The color, in well-preserved specimens, is a bright orange yellow. The sixth tergite of some females bears, on the apical part of the tergite, short, weakly-developed lateral lines and the seventh tergite of the male bears well defined, rounded basal lateral angles. On many of the specimens that I have referred to this species, both males and females, there is a conspicuous black spot at the base of the clypeus.

## SPECIMENS EXAMINED

ECUADOR: Guayaquil.

PANAMA: Penta de Pena (July 24, 1908, R. E. B. McKenney).

WEST INDIES: Isle of Pines (July 9, 1900, Palmer and Riley); San Domingo.

Handlirsch reports this species from Cuba.

## BICYRTES MENDICA (Handlirsch)

*Bembidula mendica* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat. Cl., vol. 98, 1889, p. 490.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 495.

I have before me two females that I have referred to this species. They were taken at Pie de Paulo, San Juan, Argentina, March 11, 1920, by the Cornell University Expedition.

## BICYRTES GRACILIS Parker

Figure 48

*Bicyrtes gracilis* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 68.

This species is known only from the type, a male, in the collection of the University of Kansas, collected by F. H. Snow, Santa Rita Mountains, Ariz.

## BICYRTES QUINQUEMACULATA, new species

Figure 35

*Type* (male).—Black: median spot at base of labrum; small basal spot below on scape; narrow, shortened anterior orbits; narrow,



much reduced, posterior orbits; fascia on metanotum; curved fascia on dorsum of popodeum; posterior lateral angles of propodeum; widely separated spots on tergites 1-5, decreasing in size from one to five; spot at apex of anterior and middle femora; line on anterior border of anterior and middle tibiae and metatarsus; basal part of apical segment of anterior tarsus; *yellow*.

The wings are slightly but distinctly and evenly infumated. The flagella of the antennae are lost, only the first and second segments of one remain and these are black. The second sternite on the midline basally bears a carina that extends about half the length of the sternite, but does not terminate in a process or tooth. The pubescence on the labrum, clypeus, and lower part of frons is quite short and silvery. Elsewhere it is short or lacking.

Length 17 mm. Described from a single male collected by William M. Mann at Carinas Beni, Bolivia, January, 1922.

*Type*.—Cat. No. 40855, U.S.N.M.

**BICYRTES PULLATA, new species**

*Type* (male).—Black: short, narrow anterior orbits; small spot at base of scape below; minute lateral spot on scutellum; fascia on metanotum; fascia on propodeum continued downward on posterior surface about halfway; broad spot on posterior and dorsal surfaces of lateral angles of propodeum; widely separated lateral spots on tergites 1-4, decreasing in size from one to four; spot on distal end of middle femur; anterior border of middle tibia; anterior border of anterior tibia and metatarsus; and basal part of apical segment of anterior tarsus; *yellow*.

The pubescence is short and sparse, being longest on the vertex and upper part of the frons. The antennae show no special markings or modifications. The second sternite bears a small sharp-pointed but prominent median tooth. The wedgelike edge of the lateral angle of the propodeum shows, slightly above its middle point, a small toothlike prominence. The wings are hyaline.

Although this form differs from *quinquemaculata* in having the wings hyaline instead of infumated, in having only four of the tergites maculated instead of five, and in having a prominent tooth on the second sternite; nevertheless, further collecting and study may prove that it is only a regional variety of that species. However, with only these two specimens before me it seems to me best to regard them as representatives of two distinct species.

Length 17 mm. Described from a single male taken at Chapada, Brazil.

*Type*.—In the Carnegie Museum at Pittsburgh, Pa.

**BICYRTE INSIDIATRIX (Handlirsch)**

Figure 46

*Bembidula insidiatrix* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat.

Cl., vol. 98, 1889, p. 491.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 495.

*Bicyrtes insidiatrix* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 71.

This species seems most closely related to the following species (*capnoptera*), with which it shares a tendency toward ferruginous markings. There is no tooth on the posterior coxa, the female lacks a pygidial area and lateral ridges on the sixth tergite, and the male lacks the tooth on the posterior proximal edge of the intermediate femur. The legs are wholly ferruginous.

## SPECIMENS EXAMINED

NEW MEXICO.

TEXAS: Clarendon (August 11, 1905, C. R. Jones); Jacksonville (June 28, 1906, F. C. Bishopp); Mineola (June 26, 1906, F. C. Bishopp); Rosser (August 23, 1905, C. R. Jones).

Handlirsch reports the species also from Kentucky.

**BICYRTE TRISTIS C. L. Fox***Bicyrtes tristis* C. L. Fox, Proc. Cal. Acad. Sci., vol. 12, 1923, p. 435.

This species was described from a single male taken at La Paz, Lower California. It is closely related to *capnoptera* and *mesilensis*, from which species it may be distinguished by the lack of maculation on the metanotum, the narrower fasciae on the tergites, and by the form of the seventh tergite, which in this species is much narrowed at the apex.

**BICYRTE CAPNOPTERA (Handlirsch)***Bembidula capnoptera* HANDLIRSCH, Sitz. Akad. Wissensch. Wien, Math.-Nat.

Cl., vol. 98, 1889, p. 497.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 495.

*Bicyrtes capnoptera* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 72.

The wings of this species are infumated, very heavily in the case of some specimens, much less so in the case of others. The female bears a well-marked pygidial area on the sixth tergite set off by distinct lateral ridges, the apical part of the area being somewhat rugose. The male shows no structural modifications of legs or antennae that may serve to distinguish it from the males of other species.

## SPECIMENS EXAMINED

GEORGIA: Bainbridge (September 17–October 10, 1910, J. C. Bradley); Billy's Island, Okefenokee Swamp (June, 1912).

LOUISIANA: Mansfield (August 22, 1906, F. C. Bishopp).

TEXAS: Barstow (July 22, J. C. Crawford); Dallas (July 31, 1906, W. D. Pierce); Hearne (July 23, 1906, F. C. Bishopp); Marfa (June 5, 1908, Mitchell and Cushman); Mineola (July 23, 1906, F. C. Bishopp).

Handlirsch reports this species also from Kentucky.

**BICYRTE MESILLENSIS (Cockerell)**

*Bembidula capnoptera* HANDLIRSCH, var. *mesillensis* COCKERELL, Davenport Acad. Nat. Sci., vol. 7, 1898, p. 142, male.

*Bembidula mesillensis* COCKERELL, Can. Ent., 1899, p. 255, female.

*Bicyrtes mesillensis* PARKER, Proc. U. S. Nat. Mus., vol. 52, 1917, p. 73.

In the collection of the United States National Museum are to be found two specimens of *Bicyrtes*, a male and a female, bearing labels that point to these two specimens as the ones on which Cockerell based his description of this species. In my previous paper (cited in the synonymy given above) I called attention to the divergent relationships of the male and female that had been associated as sexes of this species and raised the question of the validity of this association. Since then I have examined a large number of *Bicyrtes*, including both male and female specimens, in the collection of the California Academy of Sciences, taken at the same time at Pepper Sauce Canyon, Ariz., all of which I am convinced belong to a single species. The females in this number I regard as belonging to the same species as the female that Cockerell described as the female of *mesillensis*, but the males of this number do not belong to the species represented by the male on which *mesillensis* was based. It is my opinion that this group taken at Pepper Sauce Canyon represents either a regional variety of *ventralis* or possibly a new species and that the female assigned by Cockerell to *mesillensis* belongs with them, while the female of *mesillensis* still remains to be discovered.

NEW MEXICO: Las Cruces (Cockerell) male; Organ Mountains (Townsend) female.

**BICYRTE BRADLEYI, new species**

Figures 41, 42

*Type* (female).—Black: labrum; clypeus; scape below; lower part of frons continued upward from between the antennae by a narrow line to unite with spot below anterior ocellus; broad anterior orbits not reaching above level of anterior ocellus; posterior orbits narrowed both above and below; posterior border of pronotum including tubercles; spot on side of prothorax; broad lateral lines and pair of narrow, elliptical discal lines on scutum; fascia on posterior border of scutellum narrowed medially and narrowly interrupted at midline; metanotum; curved fascia on propodeum; lateral angles and sides of propodeum; large anterior and small posterior spot on mesopleura;



broad fasciae on tergites 1-5 all narrowly interrupted at midline, the first broadest and narrowed abruptly at the midline, the remainder slightly sinuate on either side the midline; large median spot on sixth tergite; lateral spots on sternites 2-4, decreasing in size from two to four; pair of small spots on anterior coxae; femora in part; tibiae except line below; and tarsi, *pale creamy yellow*. The tarsi are dark, almost ferruginous in color, and the maculations of the tibiae and femora are a richer yellow than those on the body.

This species differs from a typical species of the genus in that, although the propodeum is concave on its posterior surface, the degree of concavity is less than normal, and, furthermore, the posterior-lateral angles, although prominent, are rounded instead of being drawn out into sharp, wedgelike edges. It is further distinguished by the fact that, although the specimen is a female, the second sternite bears a pair of small sharp-pointed processes, which are the posterior ends of a U-shaped ridge on the sternite. The intermediate coxa bears a small tooth. The sixth tergite, which bears a well-defined, heart-shaped pygidial area, ends in a sharp point, while the broad apical end of the sixth sternite extends laterally on either side the tergite (fig. 41) in a fashion characteristic of this species.

The mandibles and the flagella are black. The wings are almost hyaline. The pubescence on head and thorax is white, very fine, and very short. The puncturing of the scutum and scutellum is uniform, very fine, and very close, much finer and closer than in the case of *variegata* or *discisa*, with which species it has been compared. It is a very unusual species.

Length 14 mm. Described from a single female collected March, 1920, at Pie de Palo, San Juan, Argentina, South America, by J. Chester Bradley, for whom the species is named.

*Type* (female).—In the collection of Cornell University.

**BICYRTE PEXA, new species**

*Type* (female).—Black: labrum; base of mandibles; clypeus, except large triangular blotch at base; scape below; small spot between antennae; broad, but short, anterior orbits; posterior orbits very narrow above; broken fascia on posterior border of pronotum; posterior border on tubercles; spot on tagulae; spot on base of anterior wings; short, lateral lines on scutum at base of wings; small, rounded lateral spots on scutellum; narrow, arcuate fascia on dorsum of propodeum; broad spot on its lateral angles; small spot near base of wings on mesopleura; interrupted fasciae on tergites 1-5, with width of interruption increasing from first to fifth, and all fasciae narrowed toward the middorsal line, except the fifth; small lateral spots on sixth; lateral spots on sternites 2-4; spot on coxae;

femora in part; anterior surface of tibiae; and tarsi more or less; *pale yellow*.

The pubescence is inconspicuous, though the labrum and the basal segments of the legs show a slight silveriness. The flagellum is black. The dorsum of the thorax, especially the scutellum, shows a beautiful metallic iridescence. In color the maculations of the head are a greenish yellow, of the body pale, and of the legs rich yellow. On the front legs all segments of the tarsus are marked with yellow, on the second pair only the first and last segments, and on the third pair only the metatarsus. The wings are almost hyaline, showing only very slight uniform infumation. The sixth tergite bears a pygidial area set off by weak, lateral lines or ridges. The middle part of the pygidial area is devoid of punctures and its lateral areas are covered with coarse, rather widely separated punctures. The areas laterad of the ridges are covered with fine, closely-placed punctures. The sixth sternite, which extends laterad of the sixth tergite much as is the case with *B. capnoptera* Handlirsch, is distinctly carinate on the midline and is finely punctulate with a few scattered coarser punctures.

Length 15 mm. The species is described from a single female from Cayenne, South America.

*Type* (female).—In the Carnegie Museum at Pittsburgh, Pa.

**BICYRTE ANGULATA (Smith)**

*Monedula angulata* SMITH, Cat. Hym. Brit. Mus., vol. 4, 1856, p. 334.

*Bembidula angulata* HANDLIRSCH, Sitz. Akad. Wissensch. Wien. Math.-Nat. Cl., vol. 98, 1889, p. 480.—DALLA TORRE, Cat. Hym., vol. 8, 1897, p. 494.

I have before me three females that I have referred to this species, which differs from all other species in the genus in having the dorsal angle of the posterior-lateral margin of the propodeum drawn out into a point. The fasciae on both tergites and sternites are usually broad and continuous, but on one of the three females at hand the fasciae on tergites 1-3 are very narrowly interrupted. The legs are almost wholly ferruginous and the wings are slightly and uniformly infumated.

SPECIMENS EXAMINED

BRAZIL: Pernambuco (January 1, 1883).

PARAGUAY: Sapucay (April 8, 1903, W. T. Foster).

Handlirsch reports this species also from Cayenne.

**BICYRTE SOLA, new species**

*Type* (female).—Black: labrum; mandibles, except tips; clypeus; lower part of frons; antenna, except last four segments; orbits; line

on pronotum; tubercles; tegulae; lateral line on scutum above tegula; pair of small discal spots on scutum; curved fascia on posterior border of scutellum; fascia on metanotum; curved fascia on dorsum of propodeum extended in two points on posterior surface; lateral angles of propodeum; three spots in vertical line on mesopleura; broad fasciae on tergites 1-5, interrupted medially on 1-4, much narrowed toward interruption on first tergite, less so on tergites 2-4, broad, continuous fascia on 5; sixth tergite entirely; narrow, apical fascia on first sternite; large, lateral spots on second sternite, joined by a narrow, apical fascia; broad fasciae on sternites 3-5, each enclosing a darker median area; sixth sternite entirely; and legs; *yellow* or *yellow and ferruginous*.

The markings on the abdomen and thorax are in the main rich yellow, but on all parts of the body there is a tendency toward ferruginous. The combination of yellow and ferruginous is best seen on the clypeus and on the legs, the basal parts being ferruginous and the distal parts yellow. The scape is yellow below, ferruginous above. The flagellum is ferruginous, growing darker toward the distal end, where the last four segments are black, except that the ultimate segment is tipped with ferruginous. The clypeus and frons are covered with short, silvery pubescence. On mesopleura the pubescence is white and somewhat longer. Elsewhere pubescence is practically wanting. The wings are without infumation. The punctures on the scutum and scutellum are somewhat coarse and uniform in distribution. The sixth tergite lacks a pygidial area and lateral ridges.

Length 18 mm. Described from a single female from Chapada, Brazil.

*Type* (female).—In the Carnegie Museum at Pittsburgh, Pa.

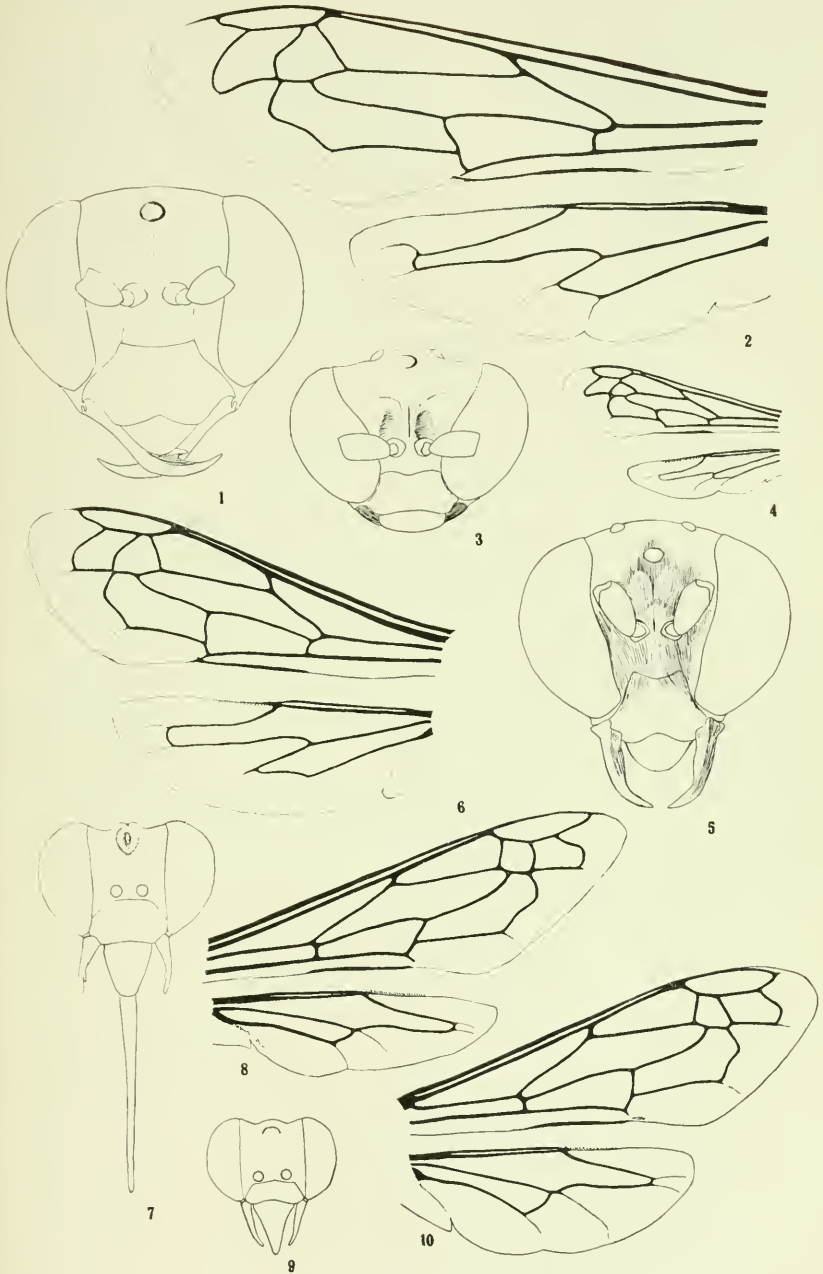
#### EXPLANATION OF PLATES

The figures of the wings were made from projections of the wings mounted in balsam under cover glasses, and are therefore exact in outline and proportions. The degree of magnification in the projections was approximately the same for all wings, so that the relative sizes of the figures show the relative sizes of the wings of the species selected as illustrations. All other figures are camera lucida drawings made directly from the parts illustrated, but the scale of magnification is not uniform so that the sizes of the figures do not show the relative sizes of the parts illustrated. In the case of the males the specimens were relaxed and the genitalia were then removed, mounted on paper points, and permitted to dry. All figures of male genitalia were made from such mounts; no balsam mounts of genitalia were used. In assembling the figures on the several plates the author has endeavored to group them together in such manner as will render them most helpful in the determination of species of these wasps.



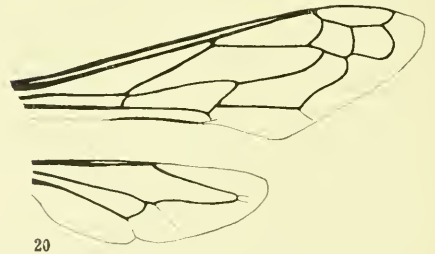
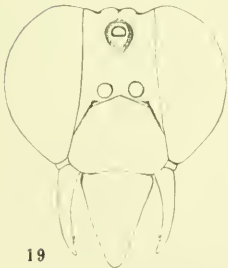
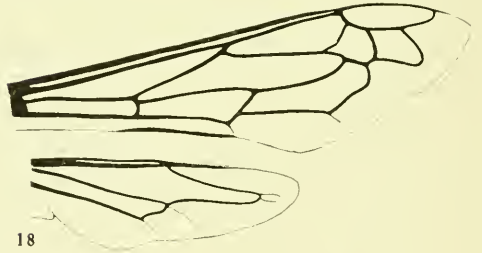
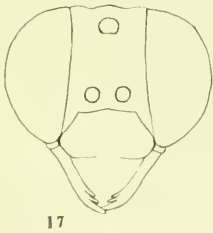
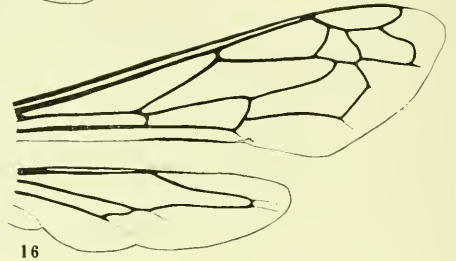
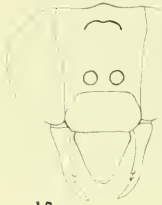
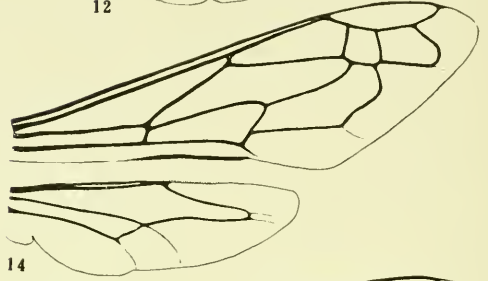
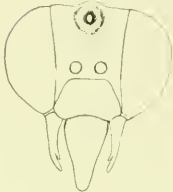
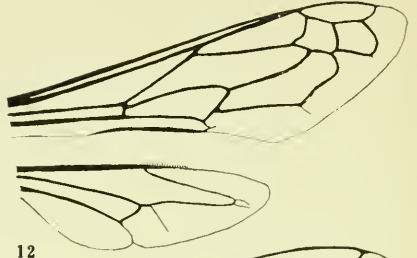
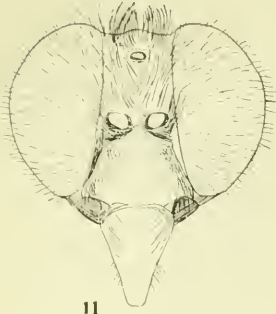
PLATE 1

- FIG. 1. *Stizus ruficornis* (Fabricius). Head, front view.  
2. *Stizus texanus* Cresson. Wings.  
3. *Bembicinus tridens* (Fabricius). Head, front view.  
4. *Bembicinus godmani* (Cameron). Wings.  
5. *Stizoides tridentatus* (Fabricius). Head, front view.  
6. *Stizoides tridentatus* (Fabricius). Wings.  
7. *Steniolia duplicata* Provancher. Head, front view.  
8. *Steniolia duplicata* Provancher. Wings.  
9. *Microbembex monodonta* Say. Head, front view.  
10. *Microbembex monodonta* Say. Wings.



FOSSORIAL WASPS OF STIZINI AND BEMBICINI

FOR EXPLANATION OF PLATE SEE PAGE 182



FOSSORIAL WASPS OF STIZINI AND BEMBICINI

FOR EXPLANATION OF PLATE SEE PAGE 183

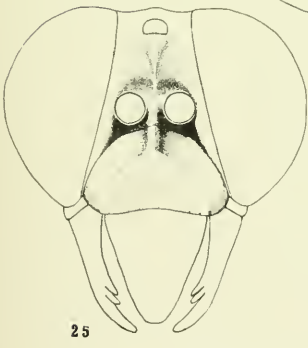
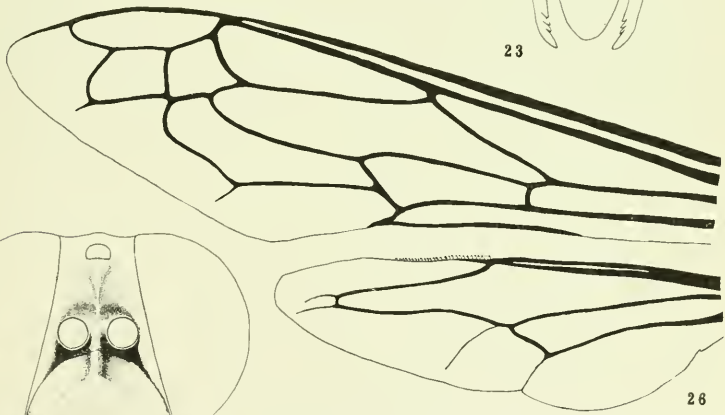
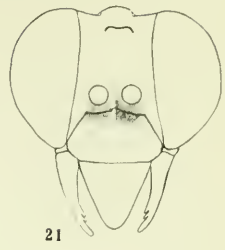


PLATE 2

- FIG. 11. *Trichostictia vulpina* (Handlirsch). Head, front view.  
12. *Trichostictia vulpina* (Handlirsch). Wings.  
13. *Stictiella pulchella* (Cresson). Head, front view.  
14. *Stictiella scitula* (Fox). Wings.  
15. *Bicyrtes quadrifasciata* (Say). Head, front view.  
16. *Bicyrtes ventralis* (Say). Wings.  
17. *Selman angustus* Parker. Head, front view.  
18. *Selman angustus* Parker. Wings.  
19. *Therapon chilensis* (Eschscholz). Head, front view.  
20. *Therapon chilensis* (Eschscholz). Wings.

PLATE 3

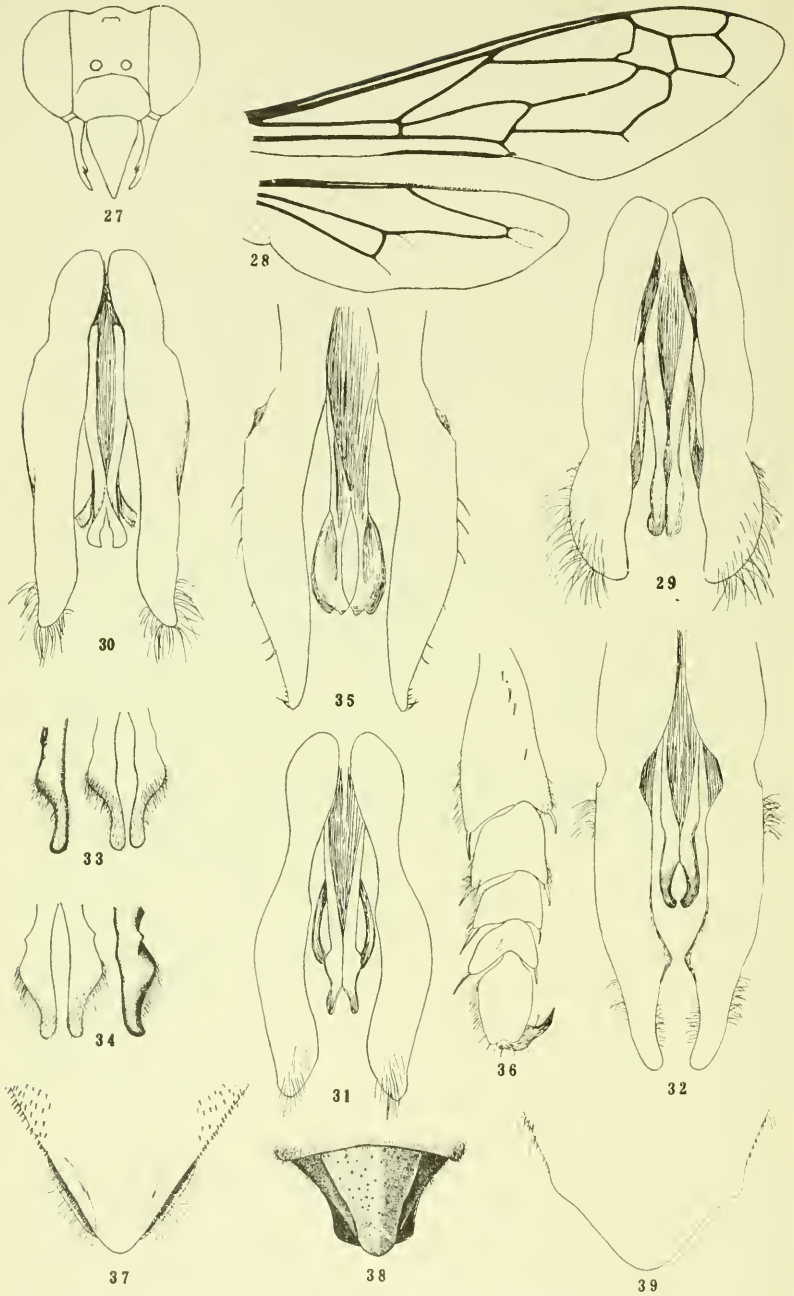
- FIG. 21. *Rubrica grvida* (Handlirsch). Head, front view.  
22. *Rubrica grvida* (Handlirsch). Wings.  
23. *Stictia signata* (Fabricius). Head, front view.  
24. *Stictia carolina* (Fabricius). Wings.  
25. *Editha magnifica* (Perty). Head, front view.  
26. *Editha magnifica* (Perty). Wings.



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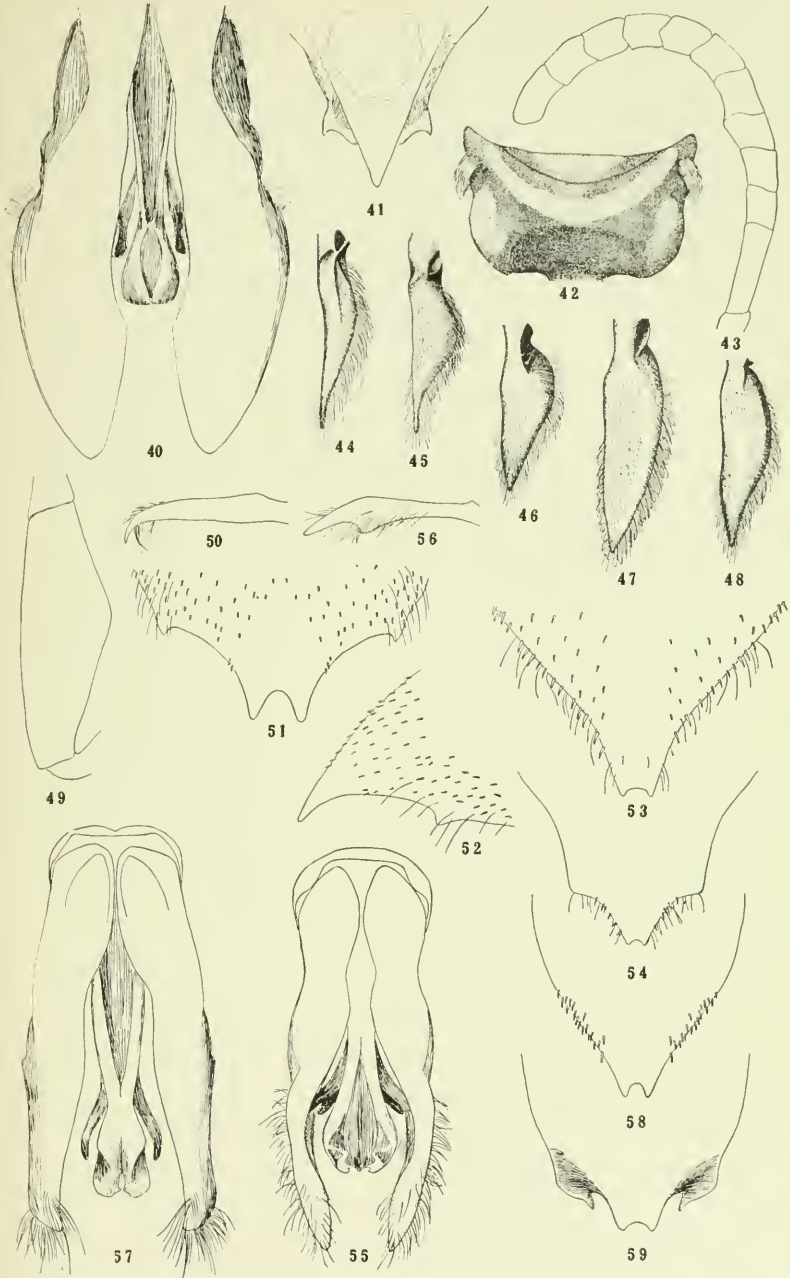
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PLATE 4

- FIG. 27. *Bembix spinolae* Lepeletier. Head, front view.  
28. *Bembix similans* Fox. Wings.  
29. *Stizus occidentalis* Parker. Genitalia, male.  
30. *Stizoides tridentatus* (Fabricius). Genitalia, male.  
31. *Steniolia longirostris* Say. Genitalia, male.  
32. *Stictiella formosa* Cresson. Genitalia, male.  
33. *Stictiella femorata* Fox. Genital stipites, male.  
34. *Stictiella divergens* Parker. Genital stipites, male.  
35. *Bicyrtes quinquemaculata* Parker. Genitalia, male.  
36. *Bicyrtes odontophora* (Handlirsch). Anterior tarsus, male.  
37. *Bicyrtes spinosa* (Fabricius). Sixth tergite, female.  
38. *Bicyrtes fodiens* (Handlirsch). Sixth tergite, female.  
39. *Bicyrtes spinosa* (Fabricius). Seventh tergite, male.

PLATE 5

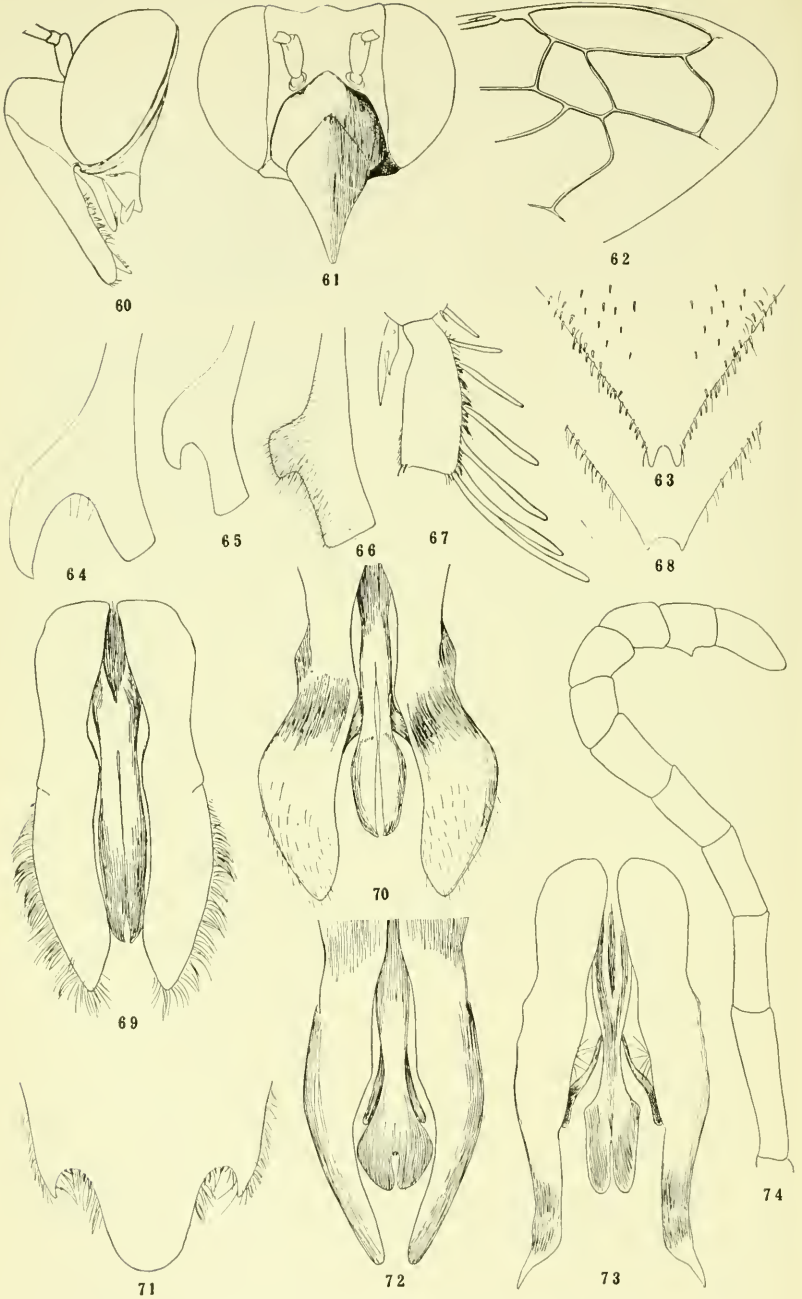
- FIG. 40. *Bicyrtes tricolorata* Parker. Genitalia, male.  
41. *Bicyrtes bradleyi* Parker. Sixth tergite, female.  
42. *Bicyrtes bradleyi* Parker. Propodeum, dorso-posterior view, female.  
43. *Bicyrtes discisa* (Taschenberg). Flagellum, male.  
44. *Bicyrtes quadrifasciata* (Say). Genital stipes, male.  
45. *Bicyrtes variegata* (Olivier). Genital stipes, male.  
46. *Bicyrtes insidiatrix* (Handlirsch). Genital stipes, male.  
47. *Bicyrtes viduata* (Handlirsch). Genital stipes, male.  
48. *Bicyrtes gracilis* Parker. Genital stipes, male.  
49. *Microbembex sulphurea* (Spinola). Posterior femur, male.  
50. *Microbembex sulphurea* (Spinola). Spine of eighth sternite, latero-ventral view, male.  
51. *Microbembex natalis* Parker. Sixth tergite, dorso-posterior view, female.  
52. *Microbembex natalis* Parker. Sixth tergite, lateral view, female.  
53. *Microbembex tricososa* Parker. Sixth tergite, dorsal view, female.  
54. *Microbembex tricososa* Parker. Seventh tergite, dorsal view, male.  
55. *Microbembex tricososa* Parker. Genitalia, male.  
56. *Microbembex bidens* Parker. Spine of eighth sternite, lateral view, male.  
57. *Microbembex bidens* Parker. Genitalia, male.  
58. *Microbembex bidens* Parker. Sixth tergite, female.  
59. *Microbembex bidens* Parker. Seventh tergite, male.



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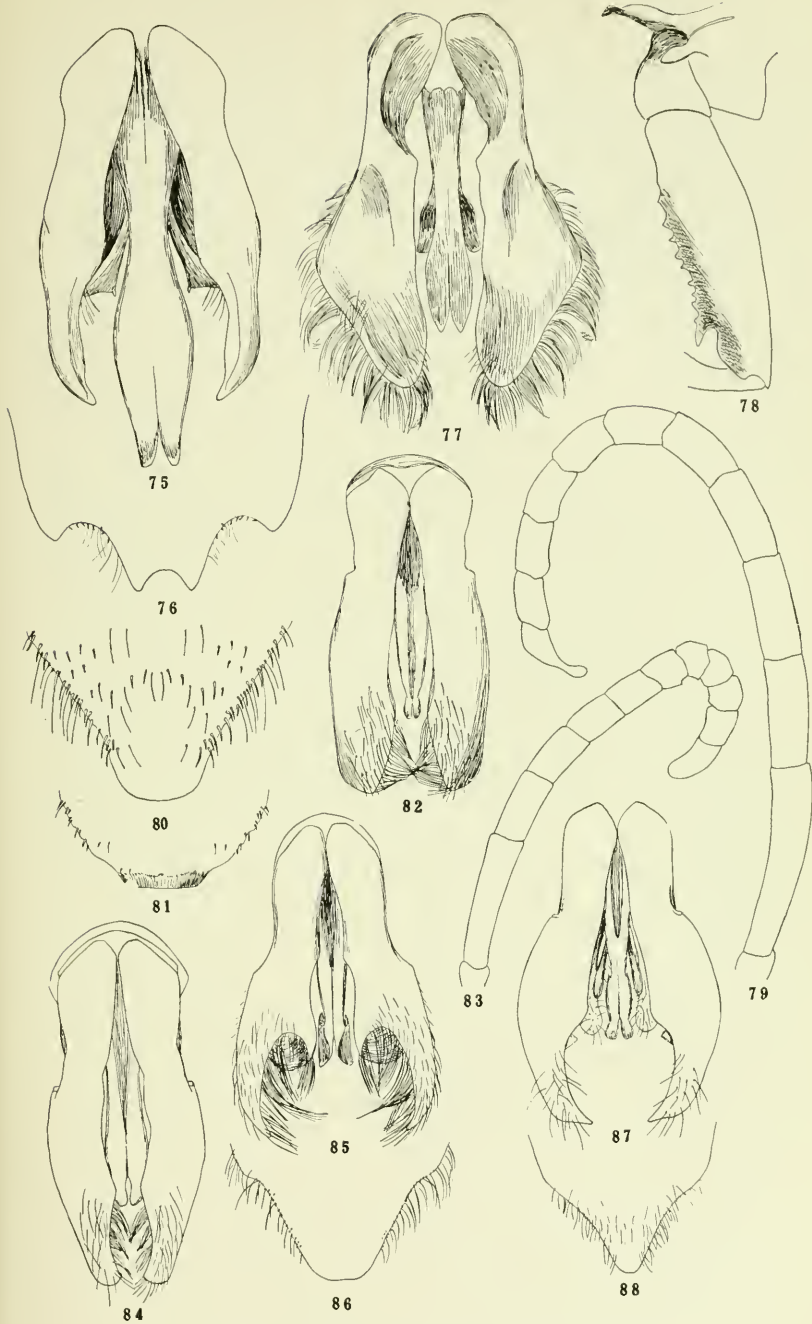
FOR EXPLANATION OF PLATE SEE PAGE 187

PLATE 6

- FIG. 60. *Microbembex nasuta* Parker. Head, lateral view, female.  
61. *Microbembex nasuta* Parker. Head, front view, female.  
62. *Microbembex equalis* Parker. Second cubital cell, female.  
63. *Microbembex equalis* Parker. Sixth tergite, female.  
64. *Microbembex aurata* Parker. Process on second sternite, male.  
65. *Microbembex monodonta* (Say). Process on second sternite, male.  
66. *Microbembex hirsuta* Parker. Process on second sternite, male.  
67. *Microbembex nasuta* Parker. Anterior metatarsus, female.  
68. *Microbembex nasuta* Parker. Sixth tergite, female.  
69. *Trichostictia vulpina* (Handlirsch). Genitalia, male.  
70. *Trichostictia guttata* (Taschenberg). Genitalia, male.  
71. *Trichostictia vulpina* (Handlirsch). Seventh tergite, male.  
72. *Stictia trifasciata* Parker. Genitalia, male.  
73. *Rubrica surinamensis* (Degeer). Genitalia, male.  
74. *Stictia mexicana* (Handlirsch). Flagellum, female.

PLATE 7

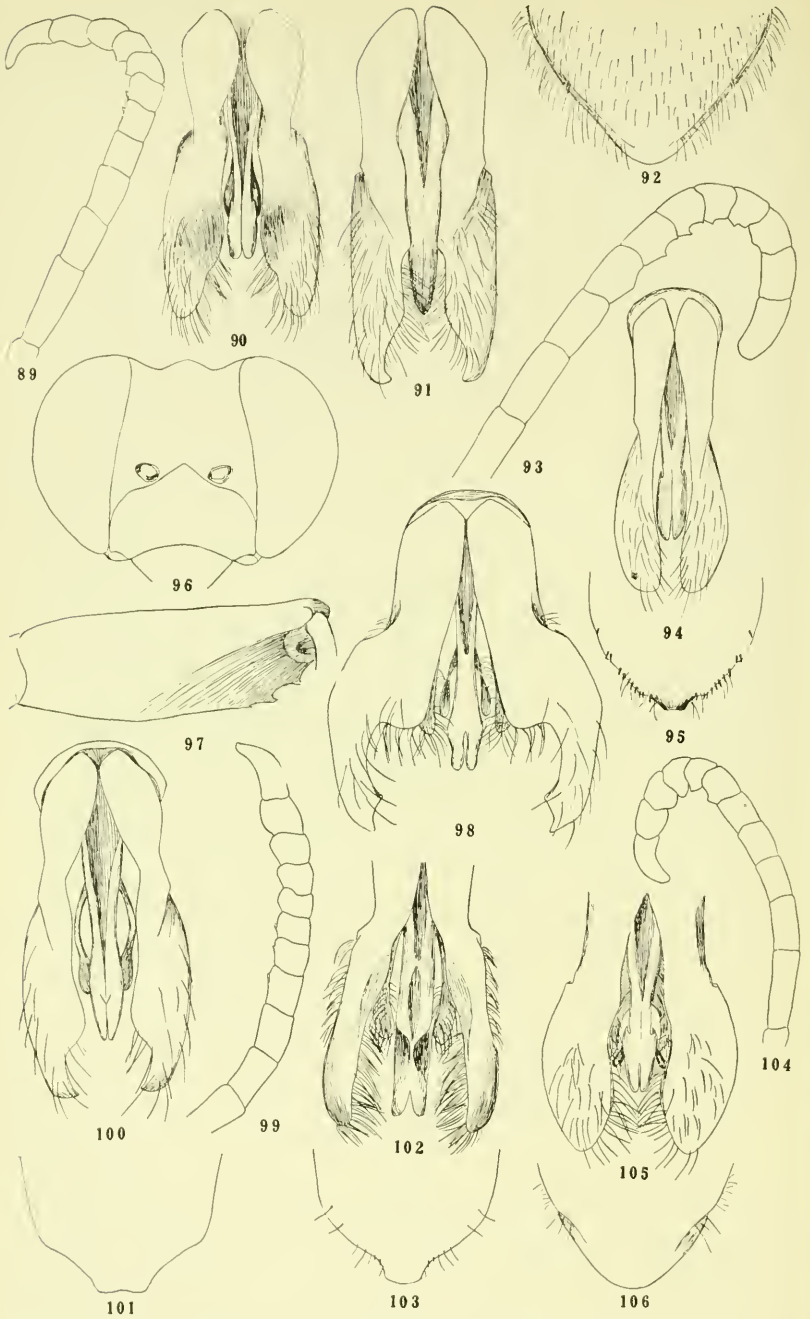
- FIG. 75. *Editha magnifica* (Perty). Genitalia, male.  
76. *Therapon chilensis* (Eschscholz). Seventh tergite, male.  
77. *Therapon chilensis* (Eschscholz). Genitalia, male.  
78. *Therapon chilensis* (Eschscholz). Basal segments of middle leg, male.  
79. *Therapon chilensis* (Eschscholz). Flagellum, male.  
80. *Bembix agrestis* Parker. Sixth tergite, female.  
81. *Bembix agrestis* Parker. Seventh tergite, male.  
82. *Bembix agrestis* Parker. Genitalia, male.  
83. *Bembix aldabra* Parker. Flagellum, male.  
84. *Bembix aldabra* Parker. Genitalia, male.  
85. *Bembix albata* Parker. Genitalia, male.  
86. *Bembix albata* Parker. Seventh tergite, male.  
87. *Bembix alacris* Parker. Genitalia, male.  
88. *Bembix alacris* Parker. Seventh tergite, male.



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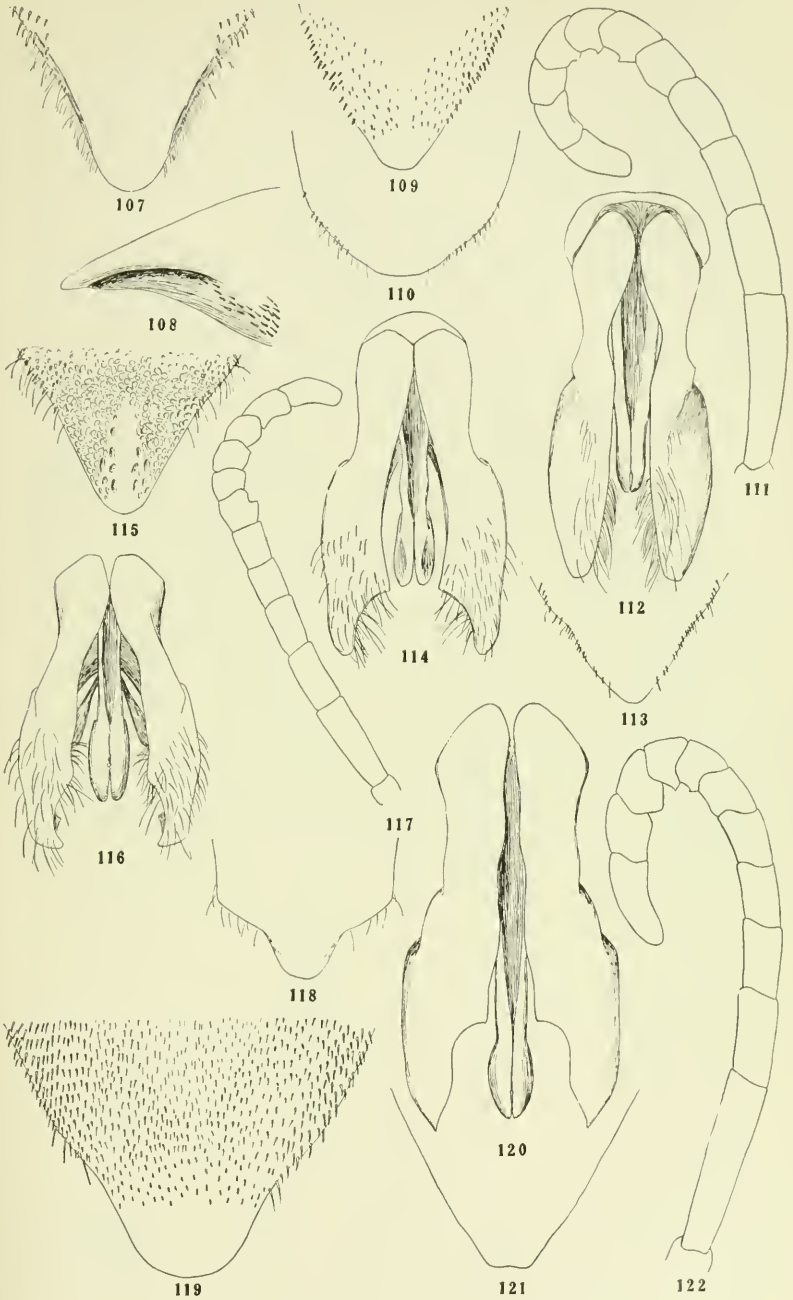
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PLATE 8

- FIG. 89. *Bembix alacris* Parker. Flagellum, male.  
90. *Bembix bahiae* Parker. Genitalia, male.  
91. *Bembix festiva* Parker. Genitalia, male.  
92. *Bembix festiva* Parker. Seventh tergite, male.  
93. *Bembix festiva* Parker. Flagellum (apical segments), male.  
94. *Bembix flavolatera* Parker. Genitalia, male.  
95. *Bembix flavolatera* Parker. Seventh tergite, male.  
96. *Bembix bellatrix* Parker. Clypeus and frons, female.  
97. *Bembix forcipata* Handlirsch. Middle femur, male.  
98. *Bembix forcipata* Handlirsch. Genitalia, male.  
99. *Bembix forcipata* Handlirsch. Flagellum (apical part), male.  
100. *Bembix frioensis* Parker. Genitalia, male.  
101. *Bembix friocensis* Parker. Seventh tergite, male.  
102. *Bembix fumida* Parker. Genitalia, male.  
103. *Bembix fumida* Parker. Seventh tergite, male.  
104. *Bembix fucosa* Parker. Flagellum, male.  
105. *Bembix fucosa* Parker. Genitalia, male.  
106. *Bembix fucosa* Parker. Seventh tergite, male.

PLATE 9

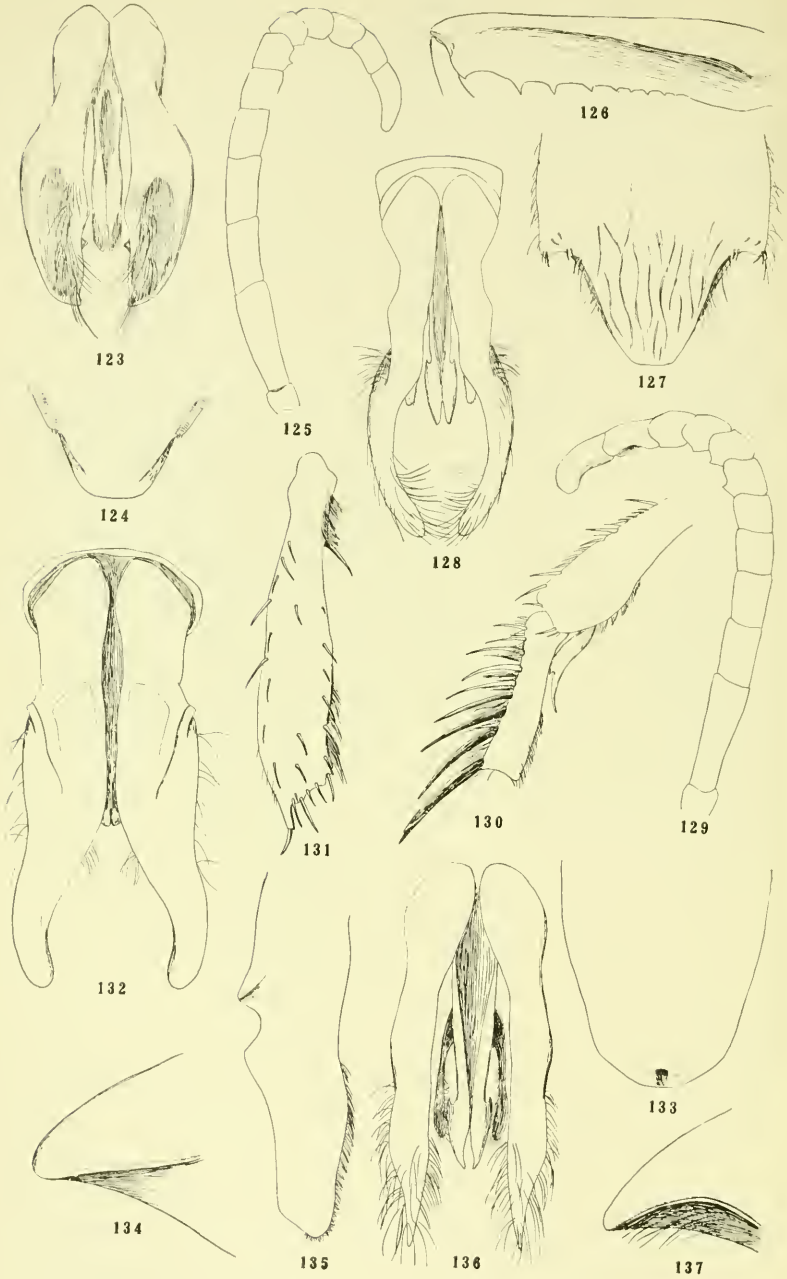
- FIG. 107. *Bembix generosa* Parker. Sixth tergite, dorsal view, female.  
108. *Bembix generosa* Parker. Sixth tergite, lateral view, female.  
109. *Bembix gracilens* Parker. Sixth tergite, female.  
110. *Bembix hamata* C. L. Fox. Seventh tergite, male.  
111. *Bembix hamata* C. L. Fox. Flagellum, male.  
112. *Bembix hamata* C. L. Fox. Genitalia, male.  
113. *Bembix kreichbaumeri* Handlirsch. Seventh tergite, male.  
114. *Bembix kreichbaumeri* Handlirsch. Genitalia, male.  
115. *Bembix laeta* Parker. Sixth tergite, female.  
116. *Bembix levis* Parker. Genitalia, male.  
117. *Bembix levis* Parker. Flagellum, male.  
118. *Bembix levis* Parker. Seventh tergite, male.  
119. *Bembix liberiensis* Parker. Sixth tergite, female.  
120. *Bembix liberiensis* Parker. Genitalia, male.  
121. *Bembix liberiensis* Parker. Seventh tergite, male.  
122. *Bembix liberiensis* Parker. Flagellum, male.



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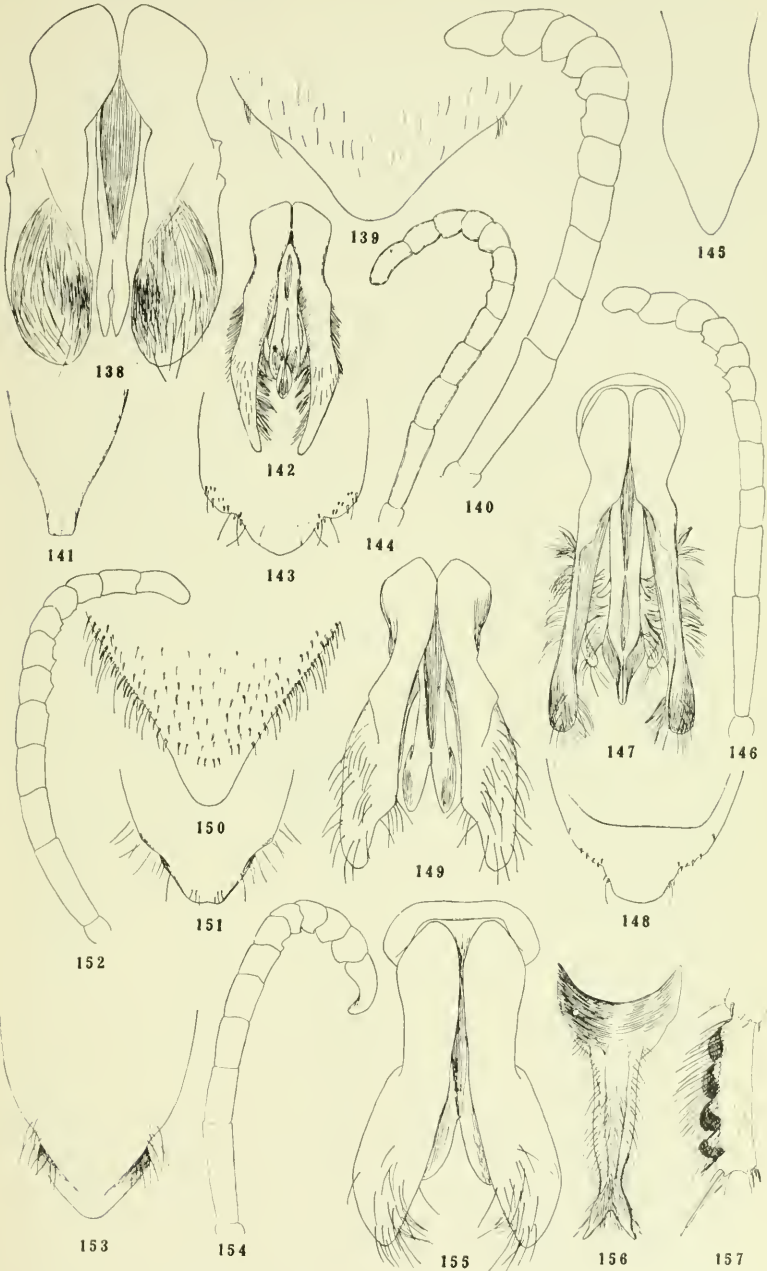
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PLATE 10

- FIG. 123. *Bembix loupata* Parker. Genitalia, male.  
124. *Bembix loupata* Parker. Seventh tergite, male.  
125. *Bembix loupata* Parker. Flagellum, male.  
126. *Bembix loupata* Parker. Middle femur, male.  
127. *Bembix magdalena* C. L. Fox. Seventh tergite, male.  
128. *Bembix magdalena* C. L. Fox. Genitalia, male.  
129. *Bembix merceti* Parker. Flagellum, male.  
130. *Bembix merceti* Parker. Anterior tibia and metatarsus, male.  
131. *Bembix merceti* Parker. Middle tibia, male.  
132. *Bembix merceti* Parker. Genitalia, male.  
133. *Bembix merceti* Parker. Seventh tergite, male.  
134. *Bembix mima* Handlirsch. Sixth tergite, dorso-lateral view, female.  
135. *Bembix mima* Handlirsch. Labrum, lateral view, female.  
136. *Bembix mima* Handlirsch. Genitalia, male.  
137. *Bembix mima* Handlirsch. Seventh tergite, dorso-lateral view, male.

PLATE 11

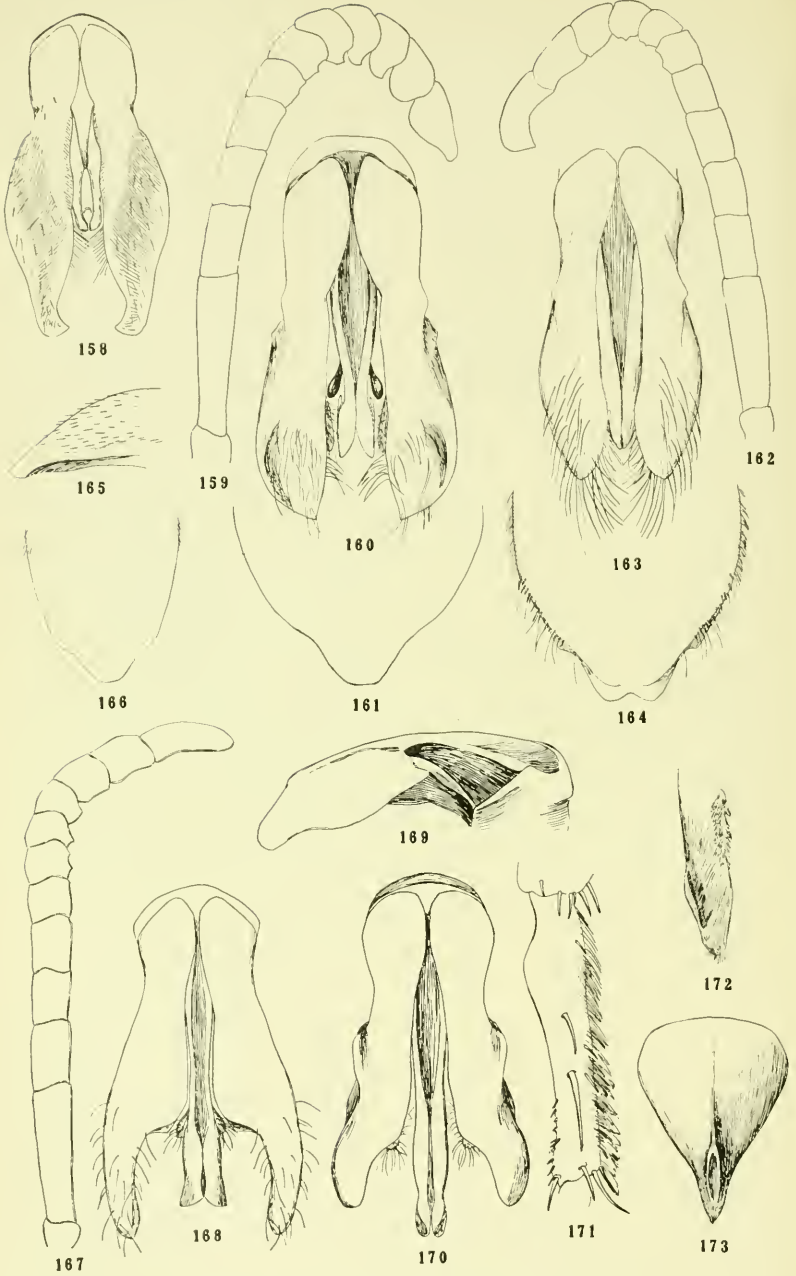
- FIG. 138. *Bembix miserabilis* Parker. Genitalia, male.  
139. *Bembix miserabilis* Parker. Seventh tergite, male.  
140. *Bembix miserabilis* Parker. Flagellum, male.  
141. *Bembix nigrocornuta* Parker. Seventh sternite, ventral view, male.  
142. *Bembix nigrocornuta* Parker. Genitalia, male.  
143. *Bembix nigrocornuta* Parker. Seventh tergite, male.  
144. *Bembix nigrocornuta* Parker. Flagellum, male.  
145. *Bembix niponica* Smith. Spine of eighth sternite, male.  
146. *Bembix ochracea* Handlirsch. Flagellum, male.  
147. *Bembix ochracea* Handlirsch. Genitalia, male.  
148. *Bembix ochracea* Handlirsch. Seventh tergite, male.  
149. *Bembix opinabilis* Parker. Genitalia, male.  
150. *Bembix opinabilis* Parker. Sixth tergite, female.  
151. *Bembix opinabilis* Parker. Seventh tergite, male.  
152. *Bembix opinabilis* Parker. Flagellum, male.  
153. *Bembix orientalis* Handlirsch. Seventh tergite, male.  
154. *Bembix orientalis* Handlirsch. Flagellum, male.  
155. *Bembix orientalis* Handlirsch. Genitalia, male.  
156. *Bembix persimilis* Turner. Spine eighth sternite, male.  
157. *Bembix persimilis* Turner. Anterior metatarsus, male.



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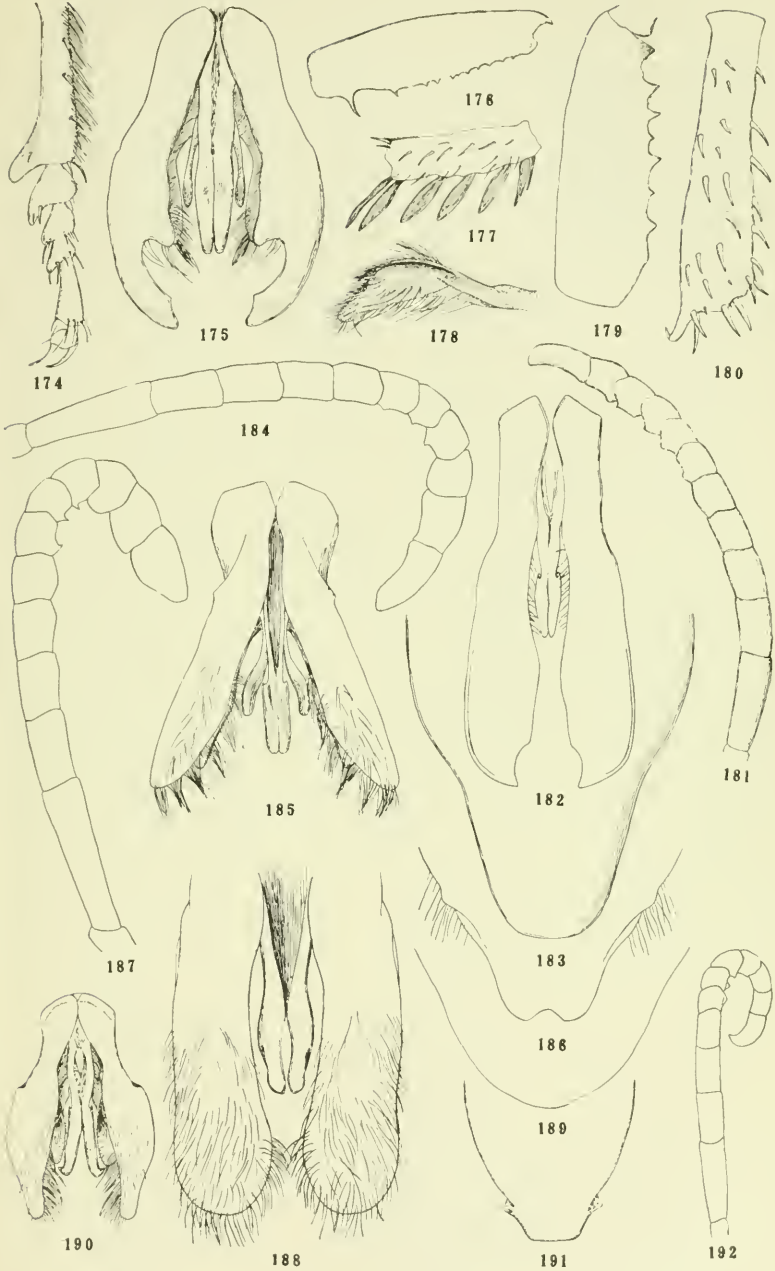
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PLATE 12

- FIG. 158. *Bembix persimilis* Turner. Genitalia, male.  
159. *Bembix picticollis* Morawitz. Flagellum, male.  
160. *Bembix picticollis* Morawitz. Genitalia, male.  
161. *Bembix picticollis* Morawitz. Seventh tergite, male.  
162. *Bembix quinquespinosa* Parker. Flagellum, male.  
163. *Bembix quinquespinosa* Parker. Genitalia, male.  
164. *Bembix quinquespinosa* Parker. Seventh tergite, male.  
165. *Bembix recurva* Parker. Seventh tergite, lateral view, male.  
166. *Bembix recurva* Parker. Seventh tergite, dorsal view, male.  
167. *Bembix recurva* Parker. Flagellum, male.  
168. *Bembix recurva* Parker. Genitalia, male.  
169. *Bembix refuscata* Parker. Genital stipes, lateral view, male.  
170. *Bembix refuscata* Parker. Genitalia, male.  
171. *Bembix refuscata* Parker. Middle metatarsus, male.  
172. *Bembix regia* Parker. Labrum, lateral view, female.  
173. *Bembix regia* Parker. Labrum, front view, female.

PLATE 13

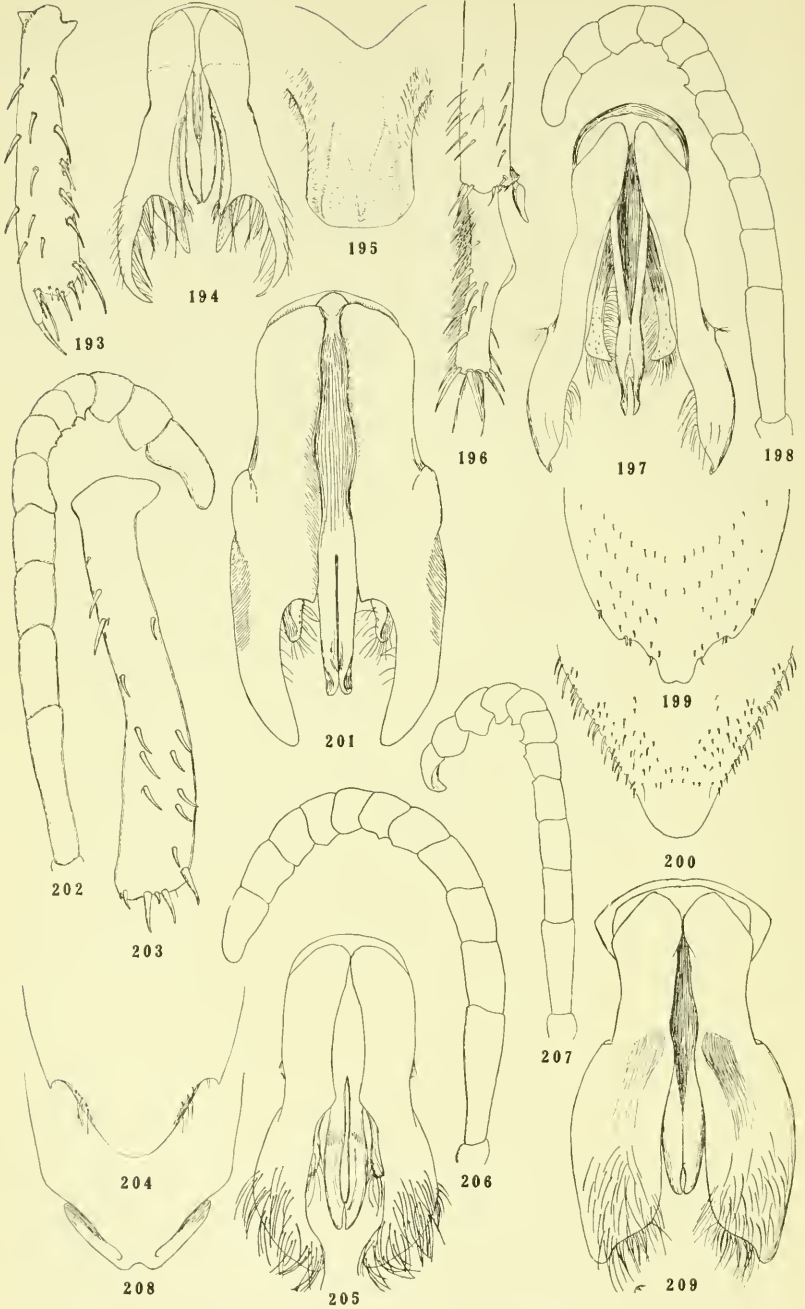
- FIG. 174. *Bembix regia* Parker. Middle tarsus, male.  
175. *Bembix regia* Parker. Genitalia, male.  
176. *Bembix regia* Parker. Middle femur, male.  
177. *Bembix regia* Parker. Anterior metatarsus, male.  
178. *Bembix regia* Parker. Spine of eighth sternite, lateral view, male.  
179. *Bembix regnata* Parker. Middle femur, male.  
180. *Bembix regnata* Parker. Middle tibia, male.  
181. *Bembix regnata* Parker. Flagellum, male.  
182. *Bembix regnata* Parker. Genitalia, male.  
183. *Bembix regnata* Parker. Seventh tergite, male.  
184. *Bembix residua* Parker. Flagellum, male.  
185. *Bembix residua* Parker. Genitalia, male.  
186. *Bembix residua* Parker. Seventh tergite, male.  
187. *Bembix rostrata* Linnaeus. Flagellum, male.  
188. *Bembix rostrata* Linnaeus. Genitalia, male.  
189. *Bembix rostrata* Linnaeus. Seventh tergite, male.  
190. *Bembix seculata* Parker. Genitalia, male.  
191. *Bembix seculata* Parker. Seventh tergite, male.  
192. *Bembix seculata* Parker. Flagellum, male.



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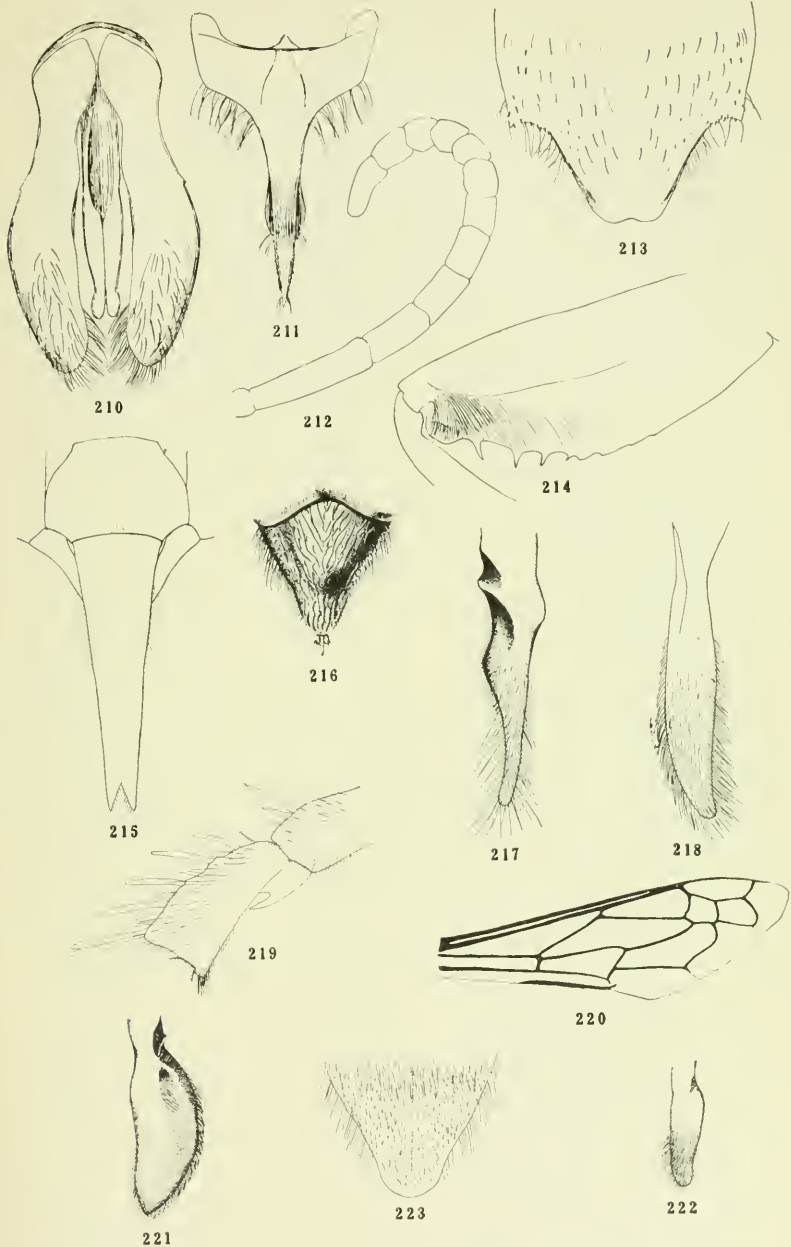
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PLATE 14

- FIG. 193. *Bembix spatulata* Parker. Middle tibia, dorsal view, male.  
 194. *Bembix spatulata* Parker. Genitalia, male.  
 195. *Bembix spatulata* Parker. Seventh sternite, ventral view, male.  
 196. *Bembix stevensoni* Parker. Middle tibia and metatarsus, male.  
 197. *Bembix stevensoni* Parker. Genitalia, male.  
 198. *Bembix stevensoni* Parker. Flagellum, male.  
 199. *Bembix stevensoni* Parker. Seventh tergite, male.  
 200. *Bembix stevensoni* Parker. Sixth tergite, female.  
 201. *Bembix tenebrosa* Parker. Genitalia, male.  
 202. *Bembix tenebrosa* Parker. Flagellum, male.  
 203. *Bembix tenebrosa* Parker. Left middle tibia, dorsal view, male.  
 204. *Bembix tenuifasciata* Parker. Seventh tergite, male.  
 205. *Bembix tenuifasciata* Parker. Genitalia, male.  
 206. *Bembix tenuifasciata* Parker. Flagellum, male.  
 207. *Bembix trepanda* Dahlbom. Flagellum, male.  
 208. *Bembix trepanda* Dahlbom. Seventh tergite, male.  
 209. *Bembix trepanda* Dahlbom. Genitalia, male.

PLATE 15

- FIG. 210. *Bembix torosa* Parker. Genitalia, male.  
211. *Bembix torosa* Parker. Spine of eighth sternite, ventral view, male.  
212. *Bembix torosa* Parker. Flagellum, male.  
213. *Bembix torosa* Parker. Seventh tergite, male.  
214. *Bembix torosa* Parker. Middle femur, male.  
215. *Bembix rugosa* Parker. Labrum, female.  
216. *Bembix rugosa* Parker. Sixth tergite, female.  
217. *Bembix arcuata* Parker. Genital stipes, male.  
218. *Bembix U-scripta* Fox. Genital stipes, male.  
219. *Bembix palmata* Smith. Anterior metatarsus, female.  
220. *Bembix arcuata* Parker. Front wing.  
221. *Bicyrtis annulata* Parker. Genital stipes, male.  
222. *Bembix comantis* Parker. Genital stipes, male.  
223. *Rubrica gravidu* (Handlirsch). Sixth tergite, female.



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