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## The Taxonomy of the Masarid Wasps, Including a Monograph on the North American Species

James Chester Bradley

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THE TAXONOMY OF THE MASARID WASPS,  
INCLUDING A MONOGRAPH ON THE  
NORTH AMERICAN SPECIES

BY

JAMES CHESTER BRADLEY

*Vespidae*  
*Hymenoptera - Masaridae*

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INTRODUCTION

Fifteen years ago, having before me all the described North American masarid wasps, I prepared tables for their identification. This was an interesting and easy task, as their characters are distinct and easily described. The manuscript remained unpublished while I awaited opportunity to determine the relations of American species of *Masaris* with the North African *vespiformis*, the type species of the genus. Later, at the suggestion of Dr. Joseph Bequaert, I renewed the study of this group, rewrote the tables, and added descriptions of all the North American species.

I have studied the wings, mouth parts, and male genitalia of all the North American species, and of species of several exotic genera. The results are of interest particularly in establishing clearly the relations of American species with *Masaris* of North Africa and with *Trimeria*. In addition, sufficient facts have been disclosed to make advisable a tentative revision of the classification of the family, which I present in the form of the subjoined tables. In view of the scantiness of my material, I do not presume to think that this classification will have more than a temporary value, but I do believe that it is an improvement, taxonomically speaking, over what has preceded, and it will at least correct certain errors in the existing keys.



Since the days of de Saussure two keys to the genera of Masaridae have been published. The one by Ashmead in the *Canadian Entomologist*, volume 34 (1902), page 219, will lead the unwary user astray for the following reasons: (1) a primary division (category 3) reads "labrum extensible" where "ligula" is meant, and if not corrected is unintelligible; (2) *Paraceramius*, *Ceramius*, *Ceramioides*, *Trimeria*, and *Jujurhta* [sic] are described as having the "labrum [i.e., ligula] not extensible," which is incorrect for these genera; (3) the character used in category 8 (marginal cell with or without an appendage) will not serve to distinguish between the groups for which it is intended; (4) the claws of *Masaris* are incorrectly described as being simple, and several other characters are thus incorrectly described and wrongly applied. The second key is a compilation by Dalla Torre published in the *Genera Insectorum*, 1904, fasc. 19, and contains most of Ashmead's errors and some additional ones.

I wish to express my acknowledgments and gratitude to Dr. Joseph Bequaert, who has contributed fertile suggestions and has taken much interest in the prosecution of this work, and has loaned me, with permission to dissect it, a female of *Celonites*, as well as specimens of *Gayella* and *Trimeria*. Acknowledgments are further extended to Dr. F. E. Lutz, for the loan of specimens of *Paragia* from the American Museum of Natural History, with permission to dissect them; to Dr. Henry Skinner, for the loan of several species of *Pseudomasaris* from the collection of the American Entomological Society, and to the authorities of the United States National Museum for courtesies extended to me while visiting that institution.

## TAXONOMY OF THE MASARID WASPS<sup>1</sup>

### THE MOUTH PARTS AND THEIR VALUE IN CLASSIFICATION

The remarkable retractile ligula of most of the genera of Masaridae has been both figured and described by de Saussure, and I do not need to dwell upon it here. When withdrawn, which is accomplished by a process of intromission, only the tip of the ligula is exposed, the

<sup>1</sup> *Explanation of the text.*—Under each genus is listed all of the species known to belong to it, but references to literature are given only since the time of Dalla Torre's *Catalogus Hymenopterorum*.

The color nomenclature is chiefly that of Ridgway's *Color Standards and Color Nomenclature*.

median parts being coiled in a great loop which may at times enormously distend the membrane of the neck. The character is a very positive one, involving the entire shape and structure of the ligula, and certain chitinized basal plates. These plates seem to be developed for the purpose of assisting in effecting the invaginating process, and there can hardly be any transition between the two conditions. This ligula is the character to which Ashmead has reference in his key to genera, writing, however, by a slip of some sort, "labrum extensile" or "labrum not extensile." The character may be usually made out under a binocular microscope without dissection, and very readily and positively by dissecting out the mouth parts; but it is a curious fact that de Saussure, owing to the poorer optical instruments available in his day, has described the condition wrongly in several genera. These errors have stood in literature until the present time.

Dr. Bequaert suggested to me that the number of palpal segments is of very doubtful generic value in the diplopterous wasps. The last joints, he says, are very apt to drop off on the emerging of the adult, or later, and furthermore there are all sorts of variations within the limits of a single genus, such as *Odynerus*. Granting that, I can not believe that the case is entirely similar in the Masaridae. My dissections agree perfectly for the most part with the figures and descriptions of de Saussure except in the case of *Celonites*. I can not believe that apical segments could be lost without leaving indications of the fact. The shape of an ultimate segment is different from that of a penultimate. I have examined all the North American species, and find within the genus *Pseudomasaris* no variation in the maxillary palpi (which are always rudimentary), and no variation in the labial palpi of the females, which are of a peculiar type, 3-segmented, but very different from the palpi of the males, even when the latter are 3-segmented. The latter vary from 1- to 3-segmented, showing progressive reduction by coalescence of the segments, as is perfectly apparent from an examination of the series. In this case it would be futile to use the number of segments of this sex as a generic or even subgeneric character. Still more surprising is the similar sexual difference in both the pairs of palpi in *Celonites*, and especially that it should have apparently escaped detection. Analogous sexual differences may, of course, exist in other genera, and within some genera there may be variation in the number of segments, as, for example, in the labial

palpi of males of *Pseudomasaris*; but I think that the variation is not likely to be such as to affect the validity of the general arrangement here laid down, although it may of course affect the details. Such variations as occur are most probably to be found within the middle groups, not at either end of the series, and especially not within the final group of three genera in which the maxillary palpi are reduced to tubercles.

#### THE WINGS AND THEIR TAXONOMIC SIGNIFICANCE

The wings display taxonomic characters of considerable importance which have been largely overlooked by previous authors. The characters that have been used are three: (1) the number of submarginal cells, (2) whether the first receives both recurrent veins, or the second and third each receive one, and (3) the presence or absence of an anal lobe in the hind wings. These characters are all of value, but the story told by the wings is still far from being finished.

#### THE POSTERIOR LOBE

In a forthcoming paper on the wings of Hymenoptera I shall discuss the nature of the posterior (i.e., anal) lobe of the hind wings throughout that order. In the more primitive Hymenoptera it is a large area separated from the rest of the wing membrane by a marginal notch, the axillary excision. This lobe and the excision are not confined to the wings of Hymenoptera, but have their homologues in other orders. The position of this notch is always at the apex of the second anal furrow, which lies between the second and the third anal veins. The notch may be retained long after both fold and veins disappear.

Anterior to the axillary excision is another notch, the preaxillary excision. It is always situated at the apex of the first anal fold, which lies invariably just cephalad of and close to the first anal vein (anal vein), crossing  $M_2$  (the submedian vein) shortly before its union with 1st A. Between the preaxillary and the axillary excisions is an area which I shall call the preanal lobe. Very often the preaxillary excision is reduced to a mere undulation of the wing membrane, but its position and that of the anal furrow are the most characteristic features of the topography of the hind wings.



In the more primitive members of each of the major groups of aculeate Hymenoptera (i.e., Formicoidea, Vespoidea, Scolioidea, Sphecoidea, and Apoidea) both axillary and preaxillary excisions are present, and accordingly both posterior and preanal lobes are well developed. Each have been lost in some or most of the specialized members of each superfamily. The tendency of specialization throughout the aculeates has been toward a reduction of the anal area of the hind wing, and especially of the posterior lobe.

With this tendency to reduction in mind, let us turn to *Euparagia*, representing the Euparagiinae, and consider the wing (fig. 100). The posterior lobe is large, two-thirds the length of the cell  $M_3 + Cu + Cu_1$ . In all other subfamilies except the Vespinae the posterior lobe is reduced to a small round or oval flap at the extreme base of the wing, from one-fifth to one-third the length of the cell  $M_3 + Cu + Cu_1$ . In the Vespinae the posterior lobe has been so completely reduced that it is altogether wanting. In this respect, as in others, *Euparagia* stands out alone as ancestral, while the Vespinae take their place as most specialized.

In all cases except the Vespinae the preaxillary excision is an insignificant notch, a mere undulation, or is altogether lacking. In the Vespinae it is deeper. Taking the order as a whole, it would seem that the primitive condition of the preaxillary excision is a distinct notch, but not a deep incision. The precise condition seems subject to variation within narrower limits than in the case of the axillary.

In the Vespinae the anal area of the hind wing is greatly reduced, so that the wing is subpetiolate.

#### THE CENTRAL AREA OF THE HIND WINGS

The venation of the central area of the hind wings is of considerable taxonomic importance. By referring to figures 97-101 and 104, plates 13, 14, 15, the modification it has undergone will be seen. Figure 98 represents a primitive condition (for aculeates) in which  $M_3$  is transverse,  $m$  and  $M_2$  are inserted below its middle, and the caudal part of  $M_3$  is interrupted just before its union with  $M_4 + Cu_{1+2} + 1st + 2d A$  by a bulla. The bulla is formed by the crossing of the 1st anal furrow, which is present, and which is lying immediately cephalad of 1st A and its amalgamates. The furrow ends in a preaxillary excision.

In Euparagiinae (fig. 100) this primitive condition is maintained except that *m* has migrated cephalad along  $M_3$  to the point of separation of the latter from  $M_4$ . The crossing of  $M_3$  by the first anal furrow is represented by a bulla, and the very faintest trace of the apical section of 1st A and its amalgamates is to be seen.

The subfamilies, which have ordinarily been classed as Eumenidae and Vespidae proper, are represented by figure 99. The vein  $M_3$  is strongly angled, receiving *m* and  $M_2$  at the angle. Both the latter vein and the apical section of 1st A and its amalgamates are ordinarily retained as fully formed veins, in some cases only as traces, but they are never wholly lost. First A ends, as always, in the preaxillary excision.

The Masaridinae have been derived from the type of figure 99 by the complete dropping out of the apical section of 1st A and its amalgamates. The wings of this subfamily are represented by figure 101, and what has happened to them is diagrammatically shown in figure 104. In the latter case the lost apical section of 1st A and its amalgamates and the anal furrow are represented respectively by a dotted and a dashed line.

In all of the Masaridinae the bulla indicating the crossing of  $M_3$  by the first anal furrow has been lost, and as the vein formed by the union of  $M_3$  with  $M_4 + Cu_{1+2} + 1st + 2d A$  has straightened out it is impossible to point out the exact spot where it occurs.

The evidence for this interpretation of the hind wing of the Masaridinae lies in the position of the preaxillary excision. It is not the obvious interpretation from a casual examination of the wing, and in the keys I have referred to the condition as " $M_3$  apparently straight and *m* lacking."

In the Gayellinae (fig. 97) both the apical section of 1st A with its amalgamates and *m* and  $M_2$  are fully preserved, but the vein *m* and  $M_2$  has migrated apicad along *m-cu* to a point remote from  $M_3$ , a condition not infrequent in other aculeate Hymenoptera, but not occurring elsewhere in the Vespidae.  $M_3$  is transverse and straight, therefore primitive, as in *Euparagia*, while the sidewise migration of *m* and  $M_2$  must be considered a specialization.

## THE MEDIAL AND CUBITAL REGIONS OF THE FOREWING

Coincident with the longitudinal plaiting of the wings of many Vespidae there has been a shifting and realignment of the veins in the central part of the wing, through which 1st A and  $Cu_2 + 1st A$ ,  $M_4$ ,  $M_{3+4}$ ,  $M_{1+2}$ ,  $R_5 + M_{1+2}$ , and  $R_5 + M_1$  together form a more or less unbroken straight bar obliquely across the wing. The plaiting occurs just caudad of this bar. At the same time  $M_4 + Cu_1$  is greatly shortened, and is situated much farther basad than usual; m-cu is inserted basad of  $M_4 + Cu_1$  and the intervening section of  $Cu_1$  is deflexed toward 1st A and  $Cu_2$ . The cell  $M_3$  is triangular, elongated basally, and pointed, the apex truncate. The condition just described is exemplified by the wing of *Mischocyttarus*. While varying in detail it is the general condition throughout the subfamilies having longitudinally plaited wings.

In the Masaridinae it is evident that the same tendencies of specialization have been operative, but they have not proceeded in any case to so high a degree of perfection. Of the genera figured, *Paragia*, *Celonites*, *Ceramiodes*, *Ceramius*, and *Trimeria* approach the condition most nearly. In each  $M_4 + Cu_1$  is situated apicad of m-cu, the intervening sector of  $Cu_1$  being deflexed. In these genera the cell  $M_3$  is narrowed or pointed at base (*Paragia*), and triangular (*Paragia*, *Celonites*, *Trimeria*), or somewhat triangular (*Ceramius* and *Paraceramius*) in form. In *Masariella*, *Masaris*, and *Pseudomasaris*  $M_4 + Cu_1$  is longer than in the other genera, and is opposite m-cu (*Masariella*), somewhat basad of it (*Masaris*), or its own length basad of m-cu (*Pseudomasaris*). Consequently, in these genera, the cell  $M_3$  is less narrowed (though still unusually narrow) at base, and less triangular in form; and the veins Cu and  $Cu_1$  instead of 1st A and  $Cu_2 + 1st A$  form a straight bar with  $M_4$ . In other words, these genera are in this respect more primitive than others, and show different stages in the type of specialization that goes hand in hand with longitudinal plaiting of the wings, and culminates in the venation exemplified by *Mischocyttarus*.

The apex of the cell  $M_3$  is closed by the vein  $M_3$ , which may be straight, or slightly curved, as in all wasps with longitudinally plaited wings (see fig. 98, of *Mischocyttarus*), as well as in some Masaridinae (*Paragia*, *Celonites*, *Trimeria*, *Masaris*, *Pseudomasaris*); or it may be angled at the point of receiving m and  $M_2$ , the angle being (on the



side of the cell  $M_3$ ) always less than  $180^\circ$ . This is the case in other Masaridinae (*Ceramioides*, *Ceramius*), and in Gayellinae. In Euparagiinae the angle is about  $125^\circ$ , the upper part of the cell  $M_3$  being produced apicad to a point closer to the cell  $R_5$  (measured along  $M_{3+4}$ ) than the length of the cephalic section of  $M_3$ , a condition not obtaining elsewhere in the Vespidae, and giving to the wing of *Euparagia* a peculiar facies. In the Gayellinae the condition in this region of the wing is almost identical with that found in *Ceramioides*— $M_4 + Cu_1$  being a little longer than in that genus.

In Euparagiinae, apart from the prolongation of the upper apical angle of the cell  $M_3$ , the condition of this region of the wing is more primitive than obtains elsewhere.  $M_4 + Cu_1$  is not abnormally far basad in the wing, is opposite m-cu and two-thirds as long as that vein, so that the cell  $Cu + Cu_1$  is wide at apex. By reason of the fact that the veins  $M_4 + Cu_1$  and  $M_3$  approach each other, the caudal margin of the cell  $M_3$  is scarcely longer than the basal width of the cell, a condition very far from being the case in any other Vespidae.

#### THE RADIAL REGION OF THE FOREWING

The most primitive condition of the radial region of the forewing occurs in Euparagiinae, Gayellinae, and Raphiglossinae, in which cells  $R_4$  and  $R_5$  are distinct, receiving, respectively, veins  $M_2$  and  $M_{3+4}$ .

In Zethinae, Eumeninae, Stenogastrinae, Epiponinae, Rhopalidiinae, Polistinae, and Vespinae the base of the free part of the vein  $M_2$  has migrated basad toward  $M_{3+4}$  until they both are opposite the cell  $R_5$ .

In Masaridinae these two veins are in the position just indicated, or in an intermediate position, but an additional step is found in the loss of the vein  $R_5$ , throwing the cells  $R_4$  and  $R_5$  together.

In the Euparagiinae, Masaridinae, and Gayellinae an appendiculate cell is always present, and in the first two of these subfamilies the cell 2d  $R_1 + R_2$  does not extend farther toward the wing apex than does the cell  $R_4$ . In the few genera in which this is not the case both cells, and, in Gayellinae and in most of the genera of Vespidae with plaited wings, the cell 2d  $R_1 + R_4$  extend closer to the wing apex than they do in Masaridinae. In Stenogastrinae this condition is carried to an extreme.

In the Vespidae with folded wings an appendiculate cell is rather exceptional.

## THE PREANAL EXCISION OF THE FOREWINGS

Most Hymenoptera have a notch (the preanal excision) in the margin of the forewing opposite the tip of  $M_{3+4} + Cu_{1+2} + 1st + 2d + 3d$  A. In most Vespidae this is present except in Euparagiinae, where it is lacking.

## THE RANK OF THE "MASARIDAE"

Not accepting the eumenid wasps as a family distinct from the Vespidae, I can still less consider the masarid wasps as a separate family. Certain tendencies develop within the masarid line which are sufficiently distinct from what we find in the other solitary Diploptera and social wasps, but in every instance such characters are developed within the group, and we can always find genera displaying conditions of the same organs which do not differ from those of other Diploptera. It is worth while to briefly review the organs that have been relied upon for distinguishing between the three so-called families.

The *mouth parts* of the more highly specialized Masaridinae, by reason of the retractile ligula, differ completely from those of other Diploptera. The tendency to great or total reduction of the number of palpal segments and of the size of the palpi is also an important group characteristic. But in *Euparagia* and *Paragia* the ligula is not retractile, and neither it nor the other mouth parts differ otherwise from the simple conditions found in the Eumeninae.

The *antennae* in the more highly specialized Masaridinae have segments 8 to 13 of the male fused into a club, the divisions between them discernible except that between segments 12 and 13, which is not to be discovered unless the specimen be boiled in caustic potash, in which case the minute segment 13 may sometimes be observed. The antennae of the females have a similar club, but usually differing in shape. In *Euparagia*, however, the male has 13 distinct and entirely separated segments without a club, the apical part of the flagellum being merely slightly thickened. In *Paraceramius lusitanicus* the antennae of the male have the apical segments hooked, as in many male Eumeninae, not clavate, and consisting (as in a few Eumeninae) of 12 segments.

The *wings* of Masaridinae are ordinarily not longitudinally plaited, and this is used by some authors as the one character for separating the "family" from other Diploptera. In *Celonites*, however, the wings are as completely plaited as in any other Diploptera.

The majority of Masaridinae have cells  $R_4$  and  $R_5$  of the forewing united (two closed submarginal cells), whereas in most other Diploptera these cells are separate (three closed submarginal cells). In *Euparagia*, however, cells  $R_4$  and  $R_5$  are separate, and also in one or two of Cameron's genera (if they be really Masaridinae). While most other Diploptera have both the veins  $M_{3+4}$  and  $M_2$  arising from the cell  $R_5$ , a few genera (*Raphiglossinae*) agree with *Euparagia* in having  $M_2$  arise from the cell  $R_4$ .

While most Masaridinae have toothed claws, like many eumenid Diploptera and unlike most vespid Diploptera, certain genera, as *Pseudomasaris*, etc., have simple claws, as has also *Euparagia*.

The vespid Diploptera usually have two spurs on the middle tibia; the Eumeninae proper have only one, but several species usually classed as Eumenidae have two. Many genera of the Masaridinae have two spurs, several genera have one, and sometimes the number varies within the genus.

I am familiar with the male *genitalia* of only a few genera of Vespid and of Eumenid Diploptera. In these the squama is acute at apex and separate from the ramus. In Masaridinae it is more often blunt and almost always fused to the ramus. But in *Euparagia* it is separate as in other Diploptera. The *genitalia* of some genera of Masaridinae differ more radically from the more primitive condition found in other Masaridinae than do the latter from those of *Vespa* or *Odynerus*.

In many of these characters *Euparagia* is the connecting link that breaks down the distinctions between other "Masaridae" and "Eumenidae." As a result, the only tenable rank for the masarine wasps, it seems to me, is as one or two subfamilies, along with the several subfamilies into which the old families Vespidae and Eumenidae may best be divided, of the single comprehensive family, Vespidae.



KEY TO THE SUBFAMILIES OF VESPIDAE<sup>2</sup>

- A. Transverse median vein ( $M_3$ ) of the hind wings straight or curved, not angled; the discoidal vein (m) usually wanting, or vague, in which latter case<sup>3</sup> the median vein, the submedian and the cubitus and the discoidal veins (m,  $M_4$ ,  $M_3$ , and m-cu) meet at a common point (*Euparagia*), or the discoidal vein is completely formed, arising from the cubitus far apicad of the transverse median vein (*Gayella*); only in *Gayella* are the discoidal vein and the apical sections of radius, cubitus and the anal vein ( $R_3$ ,  $R_{4+5} + M_1$ , m and  $M_2$ , and 1st A) all distinctly formed veins. In all other cases one of these is entirely wanting and the rest are usually only indicated as traces. Forewings with two or three submarginal cells, in the latter case the second and third each receiving a recurrent vein (veins  $M_2$  and  $M_{3+4}$  arising opposite cells  $R_4$  and  $R_5$ , respectively). Anal lobe of the hind wing always present, but the preanal excision absent or indistinct.
- B. Anal lobe of the hind wing elongate, more than one-half the length of the submedian cell ( $M_3 + Cu + Cu_1$ ). Second discoidal cell of the forewing (cell  $M_3$ ) of irregular shape, not pointed at base, its apex greatly produced above toward the apex of the wing; the section of the discoidal vein between the 1st recurrent and the subdiscoidal veins ( $M_3$  cephalad of m) almost longitudinal in position, longer than the first recurrent vein ( $M_{3+4}$ ) and forming an angle of more than  $180^\circ$  with its section caudad of the subdiscoidal vein (with  $M_3$  caudad of M); the transverse median vein of the forewings ( $M_4 + Cu_1$ ) a long crooked vein, longer than the first transverse cubitus (r-m and  $R_5$ ); three submarginal cells present in the front wing. In the hind wing a trace of the discoidal vein (m and  $M_2$ ) may be seen, arising from the point of union of the cubital, median, and transverse median veins, but there is no trace of the apical section of the anal vein; only a few (9 or 10) costal hooks present. Forewings without a distinct pre-axillary excision. Antennae of the male composed of 13 distinct segments. Mouth parts primitive, without an elongate retractile tongue, with 6 segmented maxillary and 4-segmented labial palpi....**Euparagiinae.**
- BB. Anal lobe of the hind wings a small circular or oval flap, much less than one-half the length of the submedian cell (cell  $M_3 + Cu + Cu_1$ ). In the forewings the second discoidal cell ( $M_3$ ) wedge-shaped, narrowed or often pointed at base, its cephalo-distal angle not greatly produced toward the wing apex; the section of the discoidal vein between the 1st recurrent and the subdiscoidal veins ( $M_3$  cephalad of m) transverse

<sup>2</sup> This key does not distinguish between the subfamilies Zethinae, Eumeninae, Stenogastrinae, Epiponinae, Rhopalidiinae, and Polistinae, as these groups are not treated in the present paper. Their characters are stated by Bequaert in his "Revision of the Vespidae of the Belgian Congo," *Bull. Amer. Mus. Nat. Hist.*, vol. 39 (1918), pp. 13-17.

<sup>3</sup> In reality, in all the Masaridinae, it is the apical section of the anal vein that is lost, and at least a trace of the discoidal vein is preserved. This, however, is not apparent from inspection; any one examining the wings casually would take the reverse to be the case. An explanation of the true condition is to be found under the description of the wings of Masaridinae.

or somewhat oblique in position, always shorter, often greatly shorter than the first recurrent vein ( $M_{3+4}$ ), and forming an angle of  $180^\circ$  or less with the section of the discoidal vein caudad of the subdiscoidal vein ( $M_3$  caudad of  $m$ ); the transverse median vein short and straight, often almost lacking, always shorter than the 1st transverse cubital vein ( $r-m$  plus  $R_5$ ). In the hind wings there is usually no trace of the discoidal vein ( $m$  and  $M_2$ ), but in *Gayella* it is a fully formed vein, inserted far apicad of the transverse median vein ( $M_3$ ); apical section of the anal vein always present, usually only as a trace; numerous costal hooks (20 or more) usually present.

- C. In the hind wings apparently no trace of the discoidal vein ( $m$  and  $M_2$ ) is present, and only trace of the apical sections of the radial, cubital, and anal veins<sup>3</sup> ( $R_3$ ,  $R_{4+5}$ , 1st A). Mouth parts (except in *Paragiini*) specialized, with a retractile ligula which is often greatly elongate, and showing progressive reduction in the number of palpal segments ..... **Masaridinae.**

- CC. In the hind wings the discoidal vein ( $m$  and  $M_2$ ) is present and fully formed, arising from cubitus far apicad of the submedian vein. Mouth parts primitive, the ligula not elongate, the labial palpi 4-segmented and the maxillary palpi 6-segmented (figs. 4, 97) ..... **Gayellinae.**

- AA. Transverse median vein of the hind wings ( $M_3$ ) angled for the reception of the base of the discoidal vein ( $m$ ) which is almost invariably a fully formed vein, or at least a distinct indication of the discoidal vein and the apical section of radius, cubitus, and the anal vein ( $R_3$ ,  $R_{4+5}$  +  $M_1$ ,  $m$  and  $M_2$ , 1st A) in the hind wings and these very generally all well formed veins. Forewings with 3 submarginal cells; the second discoidal cell ( $M_3$ ) ordinarily wedge-shaped, pointed at the base and broadly truncate at apex. It varies somewhat from this condition but not greatly, being always strongly narrowed at base; while the apex may be somewhat sinuate, it is never greatly extended toward the wing apex; anal lobe of the hind wings very short and circular, oval or wanting.

- B. Forewings with the second and third submarginal cells each receiving a recurrent vein (vein  $M_2$  arising opposite the cell  $R_4$ , and vein  $M_{3+4}$  rising opposite the cell  $R_5$ ) ..... **Raphiglossinae.**

- BB. Forewings with the second submarginal cell receiving both recurrent veins (veins  $M_2$  and  $M_{3+4}$  both arising opposite the cell  $R_5$ ).

- C. Posterior lobe of the hind wings present; preaxillary excision, if present, a mere undulation or shallow notch; the apical section of the anal vein not strongly curved caudad, the hind wing not subpetiolate (fig. 98) ..... **Zethinae.**

**Eumeninae, Stenogastrinae, Epiponinae, Rhopalidiinae, Polistinae.**

- CC. Anal lobe of the hind wing wanting; preaxillary excision<sup>4</sup> present, deep, the apical section of the anal vein strongly curved caudad; the hind wings subpetiolate, by reason of contraction of the anal area (fig. 99) ..... **Vespinae.**

<sup>4</sup> The preaxillary excision is a notch at the apex of the 1st anal vein of the hind wing; it is not the notch that cuts off the anal or posterior lobe, when present. Its significance is discussed in a forthcoming paper by the present writer on the wings of Hymenoptera.

A WORKING KEY FOR IDENTIFYING THE GENERA OF EUPARAGIINAE AND MASARINAE<sup>5</sup>

(This key does not pretend to present the natural relations of the genera.)

1. Abdomen strongly petiolate, the first segment elongate, formed as in *Zethus* ..... *Plesiozethus* and *Paramasaris* Cameron.<sup>6</sup>  
 Abdomen sessile, or the short first segment with a small anterior neck, but not at all *Zethus*-like ..... 2
2. Forewings with cells  $R_4$  and  $R_5$  separate (3 closed submarginal cells) ..... *Euparagia* Cresson.  
 Forewings with cells  $R_4$  and  $R_5$  coalesced (2 closed submarginal cells) .... 3
3. The first abdominal segment with an anterior neck therefore somewhat petiolate ..... *Ceramiopsis* Zavattari.  
 First abdominal segment broad and sessile, as in *Vespa* ..... 4
4. Postscutellum not covered by the scutellum, but produced caudad and bifid at apex ..... *Masaris* Fabrians.  
 Postscutellum rounded and more or less covered by the scutellum ..... 5
5. Sides of abdomen margined, serrate, venter concave; wings plaited longitudinally as in *Vespa* ..... *Celonites* Latreille.  
 Sides of abdomen not margined, venter convex or nearly flat; wings longitudinally plaited only in *Quartinia* ..... 6
6. Tegulae short, ovate or semicircular, scalelike, not covering the base of the scutellum; clypeus produced anteriorly, its margin truncate, in the females somewhat rounded ..... 11  
 Tegulae elongate and usually acute posteriorly, covering the base of the scutellum; clypeus emarginate or trilobed at apex ..... 7
7. Clypeus with its apical border trilobed;  $m = cu$  opposite  $M_4 + Cu_1$  ..... *Jugurtia* Saussure.  
 Clypeus with its apical border emarginate ..... 8
8. In the forewings the mediocubital cross-vein (basal vein) attached opposite to or basad of  $M_4 + Cu_1$  (submedian vein); third ventral segment of males unarmed; larger spur of posterior tibiae not always bifid ..... 9  
 In the forewings the mediocubital cross-vein attached to  $M_4$  far apicad of  $M_4 + Cu_1$ ; anterior trochanters of the male unarmed; third ventral segment of the male with a process; larger spurs of posterior tibia bifid ..... *Pseudomasaris* Ashmead.
9. Anterior trochanters of the male armed with a prominent claw or lamella; apical segments of the antenna of the females somewhat incrassate, but not forming a distinct ovate club; habitat South America ..... *Trimeria* Saussure.

<sup>5</sup> The synoptic tables which follow later are intended to suggest the natural relationships of the genera. They are not readily applicable for purposes of identification, and I have therefore prepared this artificial identification key, which I think may be used by any one easily and with certainty as to its meaning. At the end is a short working key to North American genera.

<sup>6</sup> Cameron distinguishes between these two genera on the grounds that in *Plesiozethus* there are only 2 closed submarginal cells, both  $M_{3+4}$  and  $M_2$  arising from the cell  $R_{4+5}$ , while in *Paramasaris* cells  $R_4$  and  $R_5$  are separate;  $M_{3+4}$  arising from cell  $R_5$  and  $M_2$  from cell  $R_4$ . Zavattari maintains that Cameron is wrong, and that both genera show the latter condition. In that eventuality it is probable that they will have to be united under the name *Paramasaris*.



- Anterior trochanters of the male unarmed; apical segments of the antenna of the female forming a distinct ovate club; habitat South Africa and southern Europe ..... 10
10. Pedicel greatly enlarged, globose, nearly as large as the scape; antennae not as long as the distance between the eyes; size small, 4 mm. .... *Quartinia* Gribodo.
- Pedicel not enlarged nor globose, less than one-half as long as the scape; antennae of the male much longer than the distance between the eyes; size large, 7 mm. or over..... *Masariella* Brauns.
11. Scutellum semicircular, very strongly elevated, its top flat, the sides abrupt, venter of the male with a process on the second segment, and with 8 exposed segments, the seventh small, simple, the eighth with a basal process; Australian ..... 12
- Scutellum elongate and more or less obtusely pointed behind, not strongly elevated, but moderately convex, or flattened on top, its sides not abrupt, venter of the male usually unarmed, with 7 exposed segments, the seventh large and truncate or subtruncate at apex; eyes emarginate at least slightly, usually deeply; European or African ..... 13
12. Eyes emarginate; parapsidal furrows absent..... *Metaparagia* Meade Waldo.  
Eyes not emarginate; parapsidal furrows distinct..... *Paragia* Shuckard.
13. Eyes deeply emarginate; venter of male unarmed ..... 14
- Eyes very broadly and shallowly emarginate, scarcely more than sinuate; third ventral segment of the male armed with one or two tubercles; middle tibiae with one apical spur; antennae of the sexes dissimilar, those of male with the apical segment elongate, tapered and recurved; mandibles of the male without a large basal tooth, clypeus of male longer than broad; anterior trochanters of male produced at apex into an elongate scale ..... *Ceramioides* Saussure.
14. Middle tibiae with a single apical spur; antennae of the sexes dissimilar, those of the male rolled at apex, the last segment much longer than broad; mandibles of male without a large basal tooth; clypeus of the male longer than broad; anterior trochanters of male unarmed ..... *Paraceramius* Saussure.
- Middle tibiae with two apical spurs; antennae of the sexes similar, not recurved at apex, the last segment broader than long; mandibles of the male with a very large tooth at base; clypeus of the male broader than long; anterior trochanter of the male produced and acute at apex ..... *Ceramius* Latreille.

KEY TO THE GENERA OF EUPARAGIINAE AND MASARIDINAE KNOWN TO OCCUR  
IN NORTH AMERICA

1. Forewing with cells  $R_4$  and  $R_5$  separate (3 submarginal cells) ..... 2  
Forewing with cells  $R_4$  and  $R_5$  coalesced (2 submarginal cells) ..... *Pseudomasaris* Ashmead
2. Abdomen sessile ..... *Euparagia* Cresson  
Abdomen petiolate, as in *Zethus* ..... *Paramasaris* Cameron and *Plesozethus* Cameron

NEW SUBFAMILY **Euparagiinae**Genus **Euparagia** Cresson

1902. *Euparagiini*, tribe Ashmead. Canadian Entomologist, vol. 34, p. 218.  
1879. *Euparagia* Cresson. Proceedings of the Academy of Natural Sciences of Philadelphia, Entomological Section, vol. 6, p. vi.  
1904. *Plesiomasaris* Cameron. Transactions of the American Entomological Society, vol. 30, p. 267.  
1905. *Odynerus* Cameron. Transactions of the American Entomological Society, vol. 31, p. 380.  
1909. *Psiloglossa* Rohwer. Entomological News, vol. 20, p. 357.

*Type*.—*Euparagia scutellaris* Cresson; genus monobasic.

*Habitat*.—Southwestern North America.

♂. Head wider than the thorax; eyes large, nearly 3 times farther apart than are the posterior ocelli, emarginate; an inconspicuous tubercle between the antennae; clypeus longer than broad, its anterior margin medially produced and bidentate; temples margined posteriorly by a fine carina, reaching to the mandibles; occiput bordered above by a second fine carina, caudad of the one bordering the temples; mandibles ending in two nearly equal teeth; ligula broad, not retractile, flat, its apex deeply acutely notched, but little longer than the paraglossae; labial palpus long, about as long as the stipes, 4-segmented; maxillary palpus longer than the stipes, 6-segmented. Antenna consisting of 13 segments, the scape about twice as long as the pedicel, equal to segment 3, segments 3 to 6 longer than broad, seventh about equal in length and breadth, 8 to 13 broader than long, together slightly fusiform.

Humeri weakly prominent; parapsidal furrows wanting; tegula semicircular, scalelike, not covering the base of the scutellum, its outer margin entire; angles of propodeum marked only by a ridge.

In the forewing m-cu attached to the junction of Cu<sub>1</sub> and M<sub>1</sub>. Tarsal claws simple; apex of the front trochanter with a long inferior claw; anterior femur somewhat contorted, with a prominent inferior tooth at base; the tibia normal, about as long as the tarsus, with an illy formed strigil; the metatarsus a little shorter than the following 4 segments together, the fourth segment as long as broad; middle femur unarmed, the apical half of the under surface flat; the tibia unarmed, a little compressed, sometimes bearing a single apical spur, in other cases with two, a trifle shorter than the tarsus; metatarsus two-thirds as long as the remaining segments together, the fourth segment as long as broad; posterior tibial spur acute, the apical half of the inner margin oblique and armed with 3 large basal and 2 minute apical teeth; the tibia about four-fifths as long as the tarsus; the metatarsus a little shorter than the following segments together.

Abdomen sessile, unarmed, the venter flat, the last ventral segment nearly semicircular. Squama forming an acute upturned hook, not fused with the ramus; sagitta of irregular shape, bearing an apparently movable oval process, the apical part of which is scarcely chitinated and bears a patch of setae; uncus broad, flat, obtuse, not barbed at base, but with a minute tooth about the middle of either side.

♀. Eyes not so large as in the male, their emarginations less sharp, the face, between the eyes, much broader than in the male, the bases of the antennae much more distant from the eyes; clypeus less deeply bifid at apex than in the male; mandibles blunt; with a tooth on the inner margin before the apex; antennae as in the male, but 12-segmented.

Trochanter, femora and other segments of the legs simple. The middle tibia show sometimes one and sometimes two apical spurs.

The venter is less flat than in the male.

The generic identity of *Psiloglossa simplicipes* with *Euparagia* was suggested to me by Dr. Bequaert. Acting upon this suggestion, we together established the certainty to our mutual satisfaction.

#### KEY TO THE SPECIES OF EUPARAGIA

- Vertex with two prominent smooth tubercles behind the ocelli; vertex and front coarsely, irregularly punctate; pronotum coarsely punctured; mesonotum rugose; posterior face of propodeum with transverse rugae at the angles, almost smooth in the middle, but with a few scattered irregular large punctures, its lateral faces smooth medially, finely punctate below and slightly aciculate above and behind; clypeus of the female with minute punctuations and scattered coarser punctures ..... *maculiceps* Cameron.
- Vertex simple without tubercles, vertex and front uniformly granular punctate; pronotum finely punctate; mesonotum evenly, finely granular-punctate; propodeum closely evenly punctulate; clypeus of the female longitudinally aciculate ..... *maculifrons* Cresson.

#### *Euparagia maculiceps* (Cameron)

1904. *Plesiomasaris maculiceps* Cameron, ♂. Trans. Amer. Ent. Soc., vol. 30, p. 267.
1905. *Odynerus simplicipes* Cameron, ♂. Trans. Amer. Ent. Soc., vol. 31, p. 380. (See Meade Waldo. Ann. and Mag. Nat. Hist., [8], vol. 14 (1914), p. 404.
1909. *Psiloglossa simplicipes* Rohwer, ♀. Ent. News, vol. 20, p. 357.

NEW MEXICO: Las Cruces, August 31, 1 ♀ at flowers of *Solidago canadensis*, type of *simplicipes* Rohwer (C. H. T. Townsend).

MEXICO: [types of *maculiceps* Cameron and *simplicipes* Cameron, British Museum]; Guerrero, 3000 feet (Godman & Salvin), [British Museum, recorded by Meade Waldo].

**Euparagia scutellaris** Cresson

Figures 1, 2, 11, 14, 26, 27, 42, 68-74, 93, 100

1879. *Euparagia scutellaris* Cresson, ♂, ♀. Proc. Acad. Nat. Sci. Phila., Ent. Sec., vol. 6, p. vi.

♂. Stout, form somewhat Oxybelus-like. Black, the following parts amber yellow: clypeus except borders, mandibles except base and apex, spot at summit of each eye, dorsal surface of pronotum, except postero-lateral margins, tubercles, tegulae at base and at apex, spot in front of scutellum, large pentagonal spot at apex of scutellum, claw on front trochanter, apical third of anterior and tips of middle and posterior femora, tibiae except for irregular reddish and brown blotches, metatarsi, apical border of dorsal segments 1 to 6 laterally dilated, and on segments 2 to 6 also medially dilated, and a median spot on each of ventral segments 2 to 7; the four apical segments of all tarsi reddish brown; flagellum except base of 1st segment, reddish brown, cream colored beneath. Head and thorax silvery sericeous, mesotergum brown-sericeous, abdomen somewhat yellowish sericeous toward the apex.

Head closely, clypeus more sparsely, regularly and rather coarsely punctulate; dorsum similarly sculptured; scutellum with a longitudinal fossa on each side; pleurae more finely and sparsely punctured than the dorsum; propodeum with a median channel, shallowly rugosely punctate; the postero-lateral angles forming a ridge but not carinate. Length, 7 mm.

♀. Colored as in male except that the entire head, except spot above each eye, the antennae, legs, except knees and venter, are black, the mandibles piceous. The clypeus is longitudinally aciculate. Otherwise like the male.

NEVADA: 2 ♂, 2 ♀ [types, American Entomological Society].

CALIFORNIA: Claremont, 3 ♂, 1 ♀ (C. F. Baker), [Pomona College, Cornell University, Jos. Bequaert]; mountains near Claremont, 1 ♂ (C. F. Baker), [Pomona College]; Santa Clara Co. (C. F. Baker), [Cornell Univ.]; Sobre Vista, Sonoma Co., 1 ♀, May 12, 1910 (J. A. Kusche), [Calif. Acad. Sci.].

**Plesiozethus** Cameron

- 1901. *Paramasaris* Cameron. Transactions of the American Entomological Society, vol. 27, p. 312.
- 1904. *Zethoides* Cameron. Transactions of the American Entomological Society, vol. 30, p. 93 (not Fox).
- 1905. *Plesiozethus* Cameron. Entomologist, vol. 38, p. 269.
- 1906. *Metazethoides* Schulz. Spolia hymenopterologica, p. 213.
- 1907. *Plesiozethus* Cameron. Entomologist, vol. 40, p. 62.
- 1912. *Plesiozethus* Zavattari. Archiv für Naturgeschichte, vol. 78, pt. A, no. 2, p. 62.



*Type*.—*Plesiozethus flavolineatus* Cameron; genus monobasic.

*Habitat*.—Panama; Colombia.

I have not seen a specimen of this genus, and consider its position very doubtful. I am even doubtful that it is a masarine wasp. Zavattari has pointed out the probable identity with *Paramasaris*, maintaining that Cameron is incorrect in stating that *Plesiozethus* has only 2 submarginal cells.

#### LIST OF SPECIES OF PLESIOZETHUS

*flavolineatus* Cameron, ♂, ♀. Panama; Colombia.

1904. *Zethoides flavolineatus* Cameron, ♂. Transactions of the American Entomological Society, vol. 30, p. 93.  
1905. *Plesiozethus flavolineatus* Cameron. Entomologist, vol. 38, p. 269.  
1906. *Metazethoides flavolineatus* Schulz. Spolia hymenopterologica, p. 213.  
1907. *Plesiozethus flavolineatus* Cameron. Entomologist, vol. 40, p. 62.  
1912. *Plesiozethus flavolineatus* Zavattari, ♂, ♀. Archiv für Naturgeschichte, vol. 78, pt. A, no. 2, p. 64 (description of female).

#### Paramasaris Cameron

1901. *Paramasaris* Cameron. Transactions American Entomological Society, vol. 27, p. 311.  
1904, 1905. *Zethoides*, *Plesiozethus*, Cameron.

*Type*.—*Paramasaris fuscipennis*, Cameron, genus monobasic.

*Habitat*.—New Mexico.

As already indicated, if Zavattari is correct in his characterization of *Plesiozethus*, it is probably identical with this genus.

#### Paramasaris fuscipennis Cameron

1901. *Paramasaris fuscipennis* Cameron, ♀. Trans. Am. Ent. Soc., vol. 27, p. 312.

“Black, covered with a white pile; the underside of the antennae brownish, the apex of the petiole and of the second segment pallid yellow; the wings fusco-hyaline; the radial cellule smoky; the stigma and nervures black. ♀. Length, 7 mm.

“Antennae shorter than the thorax; the joints of the club clearly separated, the thickening commencing from the fourth joint. The front, vertex and the upper part of the eye incision distinctly punctured; the clypeus is shining and less strongly and closely punctured; its apex is distinctly depressed and the sides are roundly narrowed. The sides of the thorax are more densely covered with a silvery pile

than is the upper part; the pro- and mesothorax are closely and distinctly punctured; on the apex of the mesonotum, in the center, are two short deep furrows, which are deep, and are wider at the apex than at the base. The scutellum is more strongly and somewhat more widely punctured; its basal furrow bears 7 stout longitudinal keels. The median segment, except on the base and the lower part of the pleurae, bears large, round, deep punctures; the center in the apex is smooth, shining and depressed; down the middle of the segment is a narrow, transversely striated band; the transverse striae being weaker at the base, and at the apex they are stouter and fewer in number. The base of the prothorax is keeled all round; behind this keel is another less distinct one, which curves backwards above to near the end of the pronotum; on the pleurae the space between the two keels is striated. Mesopleurae obscurely and sparsely punctured; in front of the centre are 7 large foveae, the upper 4 are round and deep and the uppermost is in front of the others; the lower ones are larger and deeper, are separated by stout keels, and are placed somewhat in front of those in the middle so that the row of foveae forms a curve; the apex is bordered by a narrow crenulated furrow. On the lower half of the base of the metapleurae are four deep foveae separated by stout keels; on the upper half, behind the middle, is a row of smaller foveae; the apical half is irregularly closely reticulated. Legs pruinose, black; the tarsi with a fuscous tint; the calcaria are testaceous. The radial cellule is distinctly appendiculated, the appendicular cellule being longer than broad; the second cubital cellule at the top is not one-fourth of the length of the third, at the bottom, half its length; the first recurrent nervure is received near the base, the second close to the middle of the cellule; the transverse basal nervure is interstitial. Abdomen pruinose; the petiole distinctly longer than the second segment and punctured; the punctures at the base more pronounced than elsewhere; the apex is depressed and narrowed; near the base of the narrowed neck is a row of depressed furrows."

NEW MEXICO: "Santa Fé Mts." (I have not been able to learn of any mountains bearing this name.)

#### SUBFAMILY *Masaridinae*

##### SYNOPTIC TABLE OF THE TRIBES OF MASARIDINAE

Glossae not retractile, short, scarcely exceeding the length of the paraglossae, the membranous part much shorter than the stipes and quite broad; the maxillary palpus 6-segmented, of normal length, the labial palpus 4-segmented; antenna of the male incrassate toward the apex but without a club....*Paragiini*.  
 Glossae retractile, very elongate, far exceeding the length of the paraglossae, at least as long as the stipes and usually many times as long, narrow and forming a sucking tube; maxillary palpus reduced in size, at most 4-segmented (except in *Ceramiopsis*, where it is 6-segmented), often reduced to a mere tubercle; labial palpus consisting of from 1 to 4 segments; antenna of the male with the apical segments often fused into an indistinctly segmented club .....*Masaridini*.

## SYNOPTIC TABLE TO THE GENERA OF THE TRIBE PARAGIINI

- Eyes emarginate; parapsidal furrows absent ..... *Metaparagia* Meade Waldo.  
 Eyes not emarginate; parapsidal furrows distinct ..... *Paragia* Shuckard.

## SYNOPTIC TABLE OF THE GENERA OF THE TRIBE MASARIDINI

- A. Maxillary palpus consisting of 6 segments, the labial of 4 .....  
 ..... *Ceramiopsis* Zavattari.  
 AA. Maxillary palpus consisting of 4 segments, the ligula beneath with many transverse scale-like appendages.  
 B. Middle tibia with 2 apical spurs, shorter than the first 4 segments of the tarsus united, the fourth segment longer than broad; antenna of the male like that of the female, gradually incrassate toward the apex, the penultimate segment much broader than long, the ultimate segment short, conical, not hooked; mandible of the male slender, acute, with two serrations on the inner margin somewhat removed from the apex and a strong basal tooth; clypeus of the male broader than long; second ventral segment of the male unarmed; squama slender and acute;<sup>7</sup> the uncus reduced to a small basal piece,<sup>7</sup> not readily observable; the sagitta and the volsella much enlarged and fused with those of the opposite side<sup>7</sup> ..... *Ceramius* Latreille.  
 BB. Middle tibia with only 1 apical spur,<sup>8</sup> longer than the first 4 tarsal segments together,<sup>8</sup> the fourth segment broader than long; antenna of the male unlike that of the female, the penultimate segment on its outer margin much longer than broad, the ultimate segment long, digitiform, forming a hook; mandible of the male obliquely truncate with 3 strong apical teeth but no basal tooth; clypeus of the male longer than broad; second ventral segment of the male unarmed; squama clavate;<sup>8</sup> uncus elongate;<sup>8</sup> sagitta and volsella small and not united with those of the opposite side<sup>8</sup> ..... *Paraceramius* Saussure.  
 BBB. Twelfth segment of the antenna of the male forming a large hook; clypeus of the male longer than broad; mandible of the male obliquely truncate and terminating in 3 or 4 short teeth; abdominal segments constricted at base, the second ventral segment of the male bearing a tubercle ..... *Ceramioides*<sup>9</sup> Saussure.  
 AAA. Maxillary palpi consisting of 2 or 3 segments.  
 B. Scape elongate, cylindrical or curved, more than twice as long as the pedicel.  
 C. Antenna of the female composed of 7 distinct segments, short; that of the male composed of 12 distinct segments, strongly incrassate but not forming a globular club, convex beneath ..... *Jugurtia* Saussure.

<sup>7</sup> These characters are drawn from an examination of the male of the type species, *fonscolombei*, only.

<sup>8</sup> These characters are drawn from an examination of the male of only one species, *lusitanicus*, the genotype.

<sup>9</sup> I have not seen the genotype of *Ceramioides*, so state the characters indicated by Saussure.

- CC. Antenna of the female composed of 12 segments, incrassate apically, but not forming a club; that of the male elongate, reaching the scutellum, segments 3 to 6 linear, 7 to 10 incrassate, concave beneath; 11 and 12 scarcely separable ..... **Masariella** Brauns.
- BB. Scape and pedicel both globular, the latter at least one-half as long as the former.
- C. Venter convex ..... **Quartinia** Gribodo.
- CC. Venter flat or concave ..... **Celonites** Latreille.
- AAAA. Maxillary palpus consisting of but a single very short segment, a mere tubercle easily entirely overlooked.
- B. Middle tibia with 2 apical spurs, spur of posterior tibia not bifid; labial palpus of the male 4-segmented, the apical segment very short; seventh ventral segment with a median apical notch, not deep and by no means reaching to the sixth segment; antenna of the male long, the third, fourth, and fifth segments linear, the fifth somewhat thickened, the sixth more strongly so, the seventh to twelfth segments almost indistinguishably fused into a club which is convex beneath; claws with a small median tooth; last dorsal segment, seen from the side, acute, from above ending in 2 stout teeth ..... **Masaris** Fabricius.
- BB. Middle tibia with 1 apical spur; spur of posterior tibia bifid; labial palpus 1- to 3-segmented; apical margin of seventh ventral segment of the male either truncate or with a very deep quadrate notch reaching to the sixth segment; antenna of the ♂ variously formed; claws simple; last dorsal segment, seen from the side obtusely curved, or truncate; in the latter case the truncature is margined by two strong inferior and two strong superior teeth, in the former case there are no teeth, but, seen from above, it is weakly notched at apex.
- C. Antenna of the male and of the female dissimilar, that of the male much the longer, the apex in each sex always with a club, and at least the first segment of the flagellum and usually more, much longer than broad; labial palpus in the male consisting of from 1 to 3 segments, in the latter case the last segment shorter than the preceding; in the female consisting of three segments, the first long and flattened, the second short, the third much longer than the second, falcate, very slender and acute, and ending in two stout spines; the last dorsal segment is much curved ventrad, its apical portion vertically truncate, the truncature bordered above and below by a pair of strong teeth or tubercles, the latter placed closer together than the former pair; apical margin of the seventh ventral segment with a very deep, usually rectangular emargination, reaching basad to beneath the sixth segment; squama always lamelliform and obtuse, never ending in a spine or hook; uncus never broad and flat, but slender and usually acute, and often decurved at tip ..... **Pseudomasaris** Ashmead.
- CC. Antenna of the male and of the female similar, except that that of the latter has 11, of the former, 12 segments, but slightly incrassate, the segments of the flagellum all as broad and mostly broader



than long; labial palpi 3-segmented in both sexes;<sup>10</sup> last dorsal segment hood shaped, rounded to meet the venter, without apical teeth or truncature, but slightly transversely emarginate at apex; apex of the seventh ventral segment truncate; uncus very broad and strongly depressed; squama ending in a sharp, strongly decurved hook .....*Trimeria* Buysson.

### Genus *Paragia* Shuckard

Figures 3, 13, 24, 25, 43-45, 75, 76, 91, 92, 94, 101.

♀. General form like *Vespa*. Head large; the occiput immargined; the temples broad, immargined, eyes not incised, but the inner margins sinuate, reaching the mandibles, separate from one another above by a distance equal to their own length; ocelli close, in a small triangle which is slightly broader than high; front moderately prominent; clypeus moderately prominent, the anterior margin produced and truncate; labrum short, bilobed; mandibles short and stout, the inner margin with two teeth.

The ligula is short and not retractile, composed of the two strap-like glossae, which are about the length of the labial palpus, strongly divergent, united only for a short distance at their bases. The paraglossae are similar in appearance to the glossae and but little shorter. The glossae and paraglossae are all tipped with a chitinous button, such as is often found in Eumeninae. The dorsal hind margin of the glossa bears a series of elongate and very broadly transversely flattened setae, analogous to the scales found in *Ceramius* and *Paraceramius*, and the anterior dorsal margin is fringed with smaller and less conspicuous setae, somewhat flattened in the opposite diameter. At the base of the glossa, mesad of the paraglossae is a membranous lobe armed with a group of minute tubercles, and between the two of these, in the median line, is a heavily chitinized tongue-shaped piece, the tip of which is turned upward; the labial palpus is 4-segmented, non-elongate, the first segment stout and widened at apex, the last half as long. Between the two palpi, in the median line, an anterior tongue-like extension of the heavily chitinized mentum and submentum is thickly set with sensory setae. The point of this process is very acute, turned upward and may be distinctly seen from the dorsal surface. On the dorsal side at the base of the glossa and bearing this at their apex are two chitinized plates, with a partly lateral, partly dorsal surface, joined at their bases, and formed like a letter V with expanded arms. Laterad of these, and somewhat enclosing them, is on each side a chitinized roughly triangular piece, with acute apex situated at the bases of the paraglossae. The inner margins of these two pieces are fringed with a double comb of spines; a chitinized band on either side between these pieces passes forward beneath the combs to near their apices, then ventrad between the glossae and paraglossae articulating on the ventral

<sup>10</sup> I have seen only the male, but Saussure states that they are 3-segmented in the female.

surface with the tongue-shaped chitinized piece which has been described as lying at the base of the glossae. The maxillae present features of considerable interest. The cardo is of the normal form, bent at right angles to the stipes; the inner surface of the latter meets the ventral in a sharp ridge, crested apically with a comb of bristles. The palpi are 6-segmented, the last two segments together equalling the third in length. The apical portions are turned, so that from a strictly ventral view one observes the edges of the lobes, rather than their surfaces. From a somewhat external aspect, opposite the base of the palpus, there is a triangular sclerite, projecting dorso-entad, and bearing a few spines. This is ordinarily interpreted as the lacinia. Very closely and broadly attached to its base is a large lobe extending cephalad, and to the inner upper margin of this is attached a second narrow lobe. The latter has on its upper margin a still narrower third lobe. These three lobes seem to correspond to what usually together pass for the mesal lobe of the galea, but this insect would suggest that they may really be part of the lacinia. From an inner view of the maxilla there is seen attached to the apex of the cardo a prominent but scarcely chitinized oval lobe, margined dorsally with a thick fringe of bristles, and with a few longer setae on the lower margin. This lobe is present in all Masaridae that I have examined, and may represent the basal lobe of the galea. Apicad of it is a small ear-shaped lobe, very prominent because of being more heavily chitinized than the other parts, and which probably is the outer lobe of the galea.

The scape is elongate, slightly compressed; the pedicel very short; the flagellum is incrassate toward the apex, but without forming a club, composed of 10 distinct segments, the first almost equal in length to the following 4 united.

Humeri prominent, slightly angled; parapsidal furrows distinct; the tegula small, scale-like, oval, the outer margin entire, by no means reaching the base of the scutellum; this is prominently elevated, but with its surface flat, covering the postscutellum; propodeum sloping directly to its apex, i.e., without dorsal surface, and without any lateral angles or even ridges.

Cells  $R_4$  and  $R_5$  united (i.e., two closed submarginal cells) and embracing both veins  $M_{3+4}$  and  $M_2$ ; m-cu arising from  $Cu_1$ , which at that point is deflected to meet  $M_4$ . Hind wing with a small but distinct anal lobe. Anterior trochanter unarmed; all the segments of the legs with regular convex or slightly flattened surface, without ridges or tubercles; spur of anterior tibia broad, acute, with a tooth on its convex margin; the middle tibia has two apical spurs; the larger spur of the hind tibia has its apex obliquely tridentate, the margin basad of the inner tooth pubescent; all claws are large and with a large sharp tooth at base.

The abdomen is like that of a *Vespa*.

♂. General appearance of a *Monobia* or *Eumenes*; head transversely rectangular, the temples broad, not margined behind; ocelli in a low triangle, distant from the eyes; the latter with their inner margins sinuate but not emarginate; clypeus prominent, with anterior margin

strongly produced and abruptly truncate, concealing or nearly concealing the small labrum; mandibles broad, with two large teeth before the apex. Antennae long and slender, of 12 segments, the scape long, the third segment still longer, the eleventh and twelfth segments sometimes incised beneath (tricolor).

Humeri rounded; parapsidal furrows distinct, scutellum elevated, flattened on top; propodeum slightly concave, the lateral angles rounded, without tooth above (genotype) or with a blunt tooth in some.

Forewing with two submarginal cells; m-cu attached to Cu<sub>1</sub>, which is at that point deflected caudad a very short distance to join M<sub>4</sub>. Anterior trochanter unarmed; all femora and tibia with even surfaces; middle tibia with two apical spurs; posterior tibial spur as in the females; claws large; much curved, with a strong tooth beneath near the base.

Abdomen shaped as in *Vespa*, the last dorsal segment ending in two lobes, with a shallow notch between; second ventral segment with an acute median prominence behind.

*Habitat*.—Australia.

#### LIST OF SPECIES OF PARAGIA

*australis* Saussure, ♂, ♀. Australia.

*bicolor* Saussure, ♂, ♀. Australia.

*bidens* Saussure, ♂. Australia.

*calida* Smith, ♂. Australia.

*concinna* Smith, ♀. Australia.

*deceptor* Smith, ♀. Australia.

*decepiens* Shuckard, ♂, ♀. Australia.

*excellens* Smith, ♂, ♀. Australia.

*hirsuta* Meade Waldo, ♂. N. Queensland.

1911. *Paragia hirsuta* Meade Waldo, ♂. Ann. and Mag. Nat. Hist., (8), vol. 8, p. 749.

*magdalena* Turner, ♀. Queensland.

1908. *Paragia magdalena* Turner. Trans. Ent. Soc. London, (1908), p. 89

*moroso* Smith, ♀. Australia.

*nasuta* Smith, ♀. Australia.

*odyneroides* Smith, ♂. Australia.

*perkinsi* Meade Waldo, ♀. Queensland.

1911. *Paragia perkinsi* Meade Waldo, ♀. Annals and Magazine of Natural History, (8), vol. 8, p. 750.

*praedator* Saussure, ♀. Australia.

*saussurii* Smith, ♀. Australia.

*sobrina* Smith, ♀. Australia.

*tricolor* Smith, ♂, ♀. Australia.

*venusta* Smith, ♀. Australia.

*vespiformis* Smith, ♂, ♀. Australia.

*walkeri* Meade Waldo, ♂. Australia.

1910. *Paragia walkeri* Meade Waldo, ♂. Annals and Magazine of Natural History, (8), vol. 5, p. 33.

## KEY TO THE SPECIES

Meade Waldo: Ann. and Mag. Nat. Hist., (8), vol. 5 (1910), p. 31. The following species not included: *australis*, *bicolor*, *hirsuta*, *perkinsi*.

Genus **Metaparagia** Meade Waldo

*Paragia* auctores, pars.

1911. *Metaparagia* Meade Waldo. Annals and Magazine of Natural History, (8), vol. 8, p. 748.

This genus I have not seen.

*Type*.—*Paragia pictifrons* Smith, by original designation.

## SPECIES OF METAPARAGIA

*doddi* Meade Waldo, ♀. N. Queensland.

1911. *Metaparagia doddi* Meade Waldo, ♀. Ann. and Mag. Nat. Hist., (8), vol. 8, p. 748.

*maculata* Meade Waldo, ♂, ♀. Australia.

1910. *Paragia maculata* Meade Waldo, ♂, ♀. Ann. and Mag. Nat. Hist., (8), vol. 5, p. 32.

1911. *Metaparagia maculata* Meade Waldo. *Loc. cit.*, (8), vol. 8, p. 749.

*pictifrons* (Smith) Meade Waldo, ♀. Australia.

1857. *Paragia pictifrons* Smith.

## KEY TO SPECIES OF METAPARAGIA

Meade Waldo. Ann. and Mag. Nat. Hist., (8), vol. 8 (1911), p. 749.

Genus **Ceramiopsis** Zavattari

1910. *Ceramiopsis* Zavattari. Annali del Museo civico di storia naturale, Genova, (3), vol. 4, p. 533.

1912. *Ceramiopsis* Zavattari. Arch. f. Naturgeschichte, vol. 78, pt. A, no. 2, p. 60. Figure of abdomen and description.

This genus I have not seen.

*Type*.—*Ceramiopsis gestroi* Zavattari, genus monobasic.

*Habitat*.—Brazil.

## SPECIES OF CERAMIOPSIS

*gestroi* Zavattari, ♀. Brazil.

1910. *Ceramiopsis gestroi* Zavattari, ♀. Annali del Museo civico di storia naturale, Genova, (3), vol. 4, p. 533.

1912. *Ceramiopsis gestroi* Zavattari, ♀. Arch. f. Naturgeschichte, vol. 78, pt. A, no. 2, p. 60.



Genus *Ceramius* Latreille

Figures 9, 12, 15

1904. *Euceramius* Dalla Torre. Genera Insectorum, fasc. 19, p. 5.

♂. Head broad, quadrate; clypeus broader than long, produced medially and truncate; glossa retractile, but short, when fully extended but little longer than the stipes; both palpi 4-segmented; the maxillary palpus small.

Humeri rounded; parapsidal furrows present but not deep; tegula not elongate, scale-like and without coarse punctures, the outer margin entire; angles of propodeum entirely rounded.

Medio-cubital cross-vein attached to  $Cu_1$ ; spur of anterior tibia flattened, arched, with a transparent upper margin and bifid tip; anterior trochanter alate at apex; front femur 3-sided, twisted; middle and hind femora and tibiae compressed, their surfaces regular; anterior and middle claws with a small median tooth, that of the hind claw minute; middle tibia with two nearly equal spurs; longer spur of hind tibia acute, simple.

Sixth sternite with a very deep median notch exposing a smooth and highly polished area of the seventh; the apex of the seventh produced into a thickened and truncate lobe.

Genitalia as described in the table and illustrated in figures.

The above characters are drawn from the type species. I have not seen a female.

In its genitalia this departs more radically from the usual type of the family than does any other genus which I have examined. The peculiar series of transverse erect scales beneath the ligula I have not observed elsewhere except in *Paraceramius*.

Type.—*Ceramius fonscolombi*.

Habitat.—Africa, Southern Europe, Caucasus.

SPECIES OF CERAMIUS<sup>11</sup>

*beyeri* Brauns, ♂, ♀. Cape Colony.

1903. *Ceramius beyeri* Brauns, ♂, ♀. Zeitsch. f. systemat. Hymenopterologie u. Dipterologie, vol. 3, p. 69.

*caffer* Saussure, ♀. Cape Colony (probably a variety of *lichtensteinii*).

*capensis* Saussure, ♀. Cape Colony.

[*capicola* Brauns, ♂, ♀. Cape Colony. See *Ceramioides*.]

*caucasicus* Andre, ♂. Caucasus.

*consobrinus* Saussure, ♂, ♀. Cape Colony.

1913. *Ceramius consobrinus* Brauns, ♂, ♀. Entomologische Mitteilungen, vol. 2, p. 194. (First description of male.)

*fonscolombi* Latreille, ♂, ♀. Mediterranean subregion.

[*fumipennis* Brauns, ♂, ♀. Cape Colony. See *Ceramioides*.]

<sup>11</sup> Although these species all stand in literature under this genus, they many of them doubtless belong to *Ceramioides* or *Paraceramius*.

*hispanicus* Dusmet, ♂, ♀. Spain.

1908. *Ceramius hispanicus* Dusmet. Mem. Pri. Congr. Nat. Espan., p. 180.

*karrooensis* Brauns, ♂. Cape Colony.

1902. *Ceramius karrooensis* Brauns, ♂. Zeitsch. f. systemat. Hymenopterologie u. Dipterologie, vol. 2, p. 282; vol. 3, p. 68.

*lichtensteinii* Klug, ♂, ♀. Cape Colony.

1906. *Ceramius rufomaculatus* Cameron. Trans. South African Philos. Soc., vol. 16, pt. 4.

1913. *Ceramius lichtensteinii* Brauns. Entomologische Mitteilungen, vol. 2, p. 193, pl. 2, fig. 1.

var. *macrocephalus* Saussure.

1903. *Ceramius macrocephalus* Brauns, ♂, ♀. Zeitsch. f. systemat. Hymenopterologie u. Dipterologie, vol. 3, pp. 65, 68.

1903. *Ceramius lichtensteinii* var. *macrocephalus* Brauns, ♂, ♀. Entomologische Mitteilungen, vol. 2, p. 193.

[*macrocephalus* Saussure. See *lichtensteinii* var. *macrocephalus*.]

*oraniensis* Saussure, ♂, ♀. Algeria.

*peringueyi* Brauns, ♀. Cape Colony.

1913. *Ceramius peringueyi* Brauns, ♀. Entomologische Mitteilungen, vol. 2, p. 194.

*rex* Saussure, ♀. Cape Colony. (Probably a variety of *lichtensteinii*.)

[*rufomaculatus* Cameron. See *lichtensteinii*.]

[*schulthessi* Brauns, ♂, ♀. Cape Colony. See *Ceramioides*.]

*vespiformis* Saussure, ♀. Cape Colony.

### Genus *Paraceramius* Saussure

Figures 36, 102

♂. Head quadrate, not as broad as in *Ceramius*; clypeus elongate, not as squarely truncate as in *Ceramius*; the glossae retractile, elongate, forming a tubular ligula, with a peculiar series of transverse erect scales beneath, as in *Ceramius*; palpi as in *Ceramius*.

Humeri entirely rounded; parapsidal furrows wanting; tegula small, scale-like, without coarse punctures, the outer margin rounded, entire; angles of propodeum entirely rounded.

Venation as in *Ceramius*. Spur of anterior tibia as in *Ceramius* except that it ends in a lobe and a spine instead of two nearly equal spines; anterior trochanter simple, the femur with a sharp crest beneath; all claws with a large basal tooth; middle tibia with one apical spur; the larger spur of hind tibia with 3 short spines before its tip.

Sixth and seventh sternites as in *Ceramius*.

Genitalia as described in the table and illustrated in figure 8.

The above characters apply to *P. lusitanicus* (Klug). I have not seen a female.

The single spur on the middle tarsus, the difference in the spurs on the anterior and hind tarsi, the simple front trochanters, the great genitalic and other differences make it impossible to include this group any longer as a subgenus of *Ceramius*.

*Habitat*.—Korea, Southern Europe, Africa.

## SPECIES OF PARACERAMIUS

*koreensis* Radoszkowski, ♀. Korea.

*linearis* Klug, ♂. Cape Colony.

*lusitanicus* Klug, ♂, ♀. Southern Europe.

var. *luteoclypeata* Dusmet, ♂. Spain.

1908. *Ceramius lusitanicus* var. *luteoclypeata* Dusmet. Mem. Pri. Congr.

Nat. Espan., 1908, p. 180.

[*nigripennis* Saussure. See *Ceramioides*.]

*spiricornis* Saussure, ♂, ♀. France and Spain.

Genus *Ceramioides* Saussure

♂. Eyes very distant from each other and from the ocelli formed on the vertex, their inner margins very broadly and shallowly emarginate, but little more than sinuate; clypeus flat, longer than broad, its anterior margin produced and squarely truncate; mandibles rather broad and flat, two teeth on the inner margin before the apex, labial palpi 4-segmented. Antennae long and slender, of 12 segments, a very little widened before the apex, the eleventh segment longer than broad, the twelfth more than twice as long as the eleventh, tapered and recurved, forming an apical hook.

Humeri entirely rounded; parapsidal furrows weak anteriorly but forming two deep grooves near the middle line just before the scutellum; tegulae short, scale-like, not covering the base of the scutellum, impunctate; disc of scutellum flat, posteriorly broadly rounded, covering and concealing the rounded postscutellum; posterior face of propodeum small, flat, rounded into the sides below, but superiorly sharply truncate.

In the forewings m-cu inserted shortly basad of  $M_4 + Cu_1$ ,  $Cu_1$  at the point of insertion of m-cu turning caudad for a short way to meet  $M_4$ . Anterior trochanter produced at apex into an elongate scale, tibiae and femora with even surfaces except that the anterior femur is widened beneath before the middle; middle tibia with a single spur at apex; larger posterior tibial spur with two spines and a tooth on its margin toward the apex; claws with a small tooth on the inner margin at its middle.

Abdomen subcylindrical, flattened beneath, the second, third, and fourth dorsal segments somewhat constricted basally; the last dorsal segment rounded and unarmed; the third ventral segment armed with two tubercles; the seventh ventral segment posteriorly produced ventrad and pointed.

♀. Differs from the male in the following particulars: clypeus with its anterior margin broadly rounded, indistinctly separated from the front, antennae much shorter, weakly incrassate from the third segment to the apex, the apical segment as broad as long, no longer than the preceding, the third segment more than twice as long as the pedicel, longer than segments 4 and 5; tooth of the claws larger; second ventral segment unarmed and last ventral apically simple and rounded.

Generic description drawn from *capicola* Brauns. I have not seen the genotype.

*Nigripennis* Sauss. (*det.* Brauns) agrees in all respects except that parapsidal furrows are distinct throughout and 2 tubercles are on third instead of second segment.

*Type*.—*Ceramius cerceriformis* Saussure, genus monobasic.

*Habitat*.—South Africa.

#### SPECIES OF CERAMIOIDES

*cerceriformis* Saussure, ♂. Cape Colony.

*capicola* Brauns, ♂, ♀. South Africa.

1902. *Ceramius capicola* Brauns. Zeitsch. f. systematische Hymenopterologie u. Dipterologie, vol. 2, p. 278; vol. 3, p. 68. (On p. 280, lines 14-48 apply to *fumipennis* instead of to *capicola*. In line 17, p. 279, "dorsale" should read "ventrale.")

*fumipennis* Brauns, ♂, ♀. Cape Colony.

1902. *Ceramius fumipennis* Brauns, ♂, ♀. Zeitsch. f. systematische Hymenopterologie u. Dipterologie, vol. 2, p. 275; vol. 3, p. 68. (On p. 280, lines 15-48 apply to this species.)

*schulthessi* Brauns, ♂, ♀. Cape Colony.

1902. *Ceramius schulthessi* Brauns, ♀. Zeitsch. f. systemat. Hymenopterologie u. Dipterologie, vol. 2, p. 182.

1913. *Ceramius schulthessi* Brauns, ♂, ♀. Entomologische Mitteilungen, vol. 2, p. 196, pl. 2, fig. 6.

*nigripennis* Saussure, ♂, ♀. Cape Colony.

1913. *Ceramius nigripennis* Brauns, ♂, ♀. Entomologische Mitteilungen, vol. 2, p. 201, pl. 2, fig. 3. (First description of the male.)

#### Genus *Jugurtia* Saussure

1894. *Jugurthia* Dalla Torre. Catalogus Hymenopterorum, vol. 9, p. 5.

♀. Shape and general appearance of female of *Pseudomasaris*, eyes very widely separated above, deeply incised, the incision broadly rounded; clypeus scarcely convex, its apical border trilobed; labrum semicircular; mandibles acute, two teeth on the inner margin; ligula retractile, labial palpi 4-segmented, the fourth segment, however, a minute tubercle, the third about equal in length to the second, and bearing three stout curved spines. Antennae as in *Pseudomasaris*.

Humeri rounded dorsally, margined laterally; parapsidal furrows absent; mesonotum flattened but not depressed before the slightly elevated scutellum, tegula elongate, pointed, covering the base of the scutellum, posteriorly punctate, its outer margin entire; apical part of scutellum with a weak depression, the apex weakly bifid; scutellum covering and concealing the rounded postscutellum; propodeum posteriorly flat, its lateral angles weak, neither dentate nor mucronate.



The medio-cubital cross-vein attached opposite to  $M_4 + Cu_1$ . Middle tibia with two apical spurs beneath, a short one above, posterior tibia with its larger apical spur bifid.

Abdomen as in *Pseudomasaris*, the second ventral segment with a transverse ridge, the last segment broadly rounded at apex.

*Habitat*.—Asia, Southern Europe, Africa.

#### SPECIES OF JUGURTIA

*chlorotica* Morawitz, ♀. Transcaspia.

*escaleræ* Meade-Waldo, ♀. Persia.

1910. *Jugurtia escaleræ* Meade-Waldo, ♀. Ann. Mag. Nat. Hist., (8), vol. 5, p. 33.

[*neotropica* Mocsarya. See *Trimeria neotropica*.]

*numida* Saussure, ♂. Algeria.

*oraniensis* Saussure, ♂, ♀. Spain, Algeria.

*simpsoni* Meade-Waldo, ♀. Gambia.

1911. *Jugurtia simpsoni* Meade-Waldo, ♀. Ann. Mag. Nat. Hist., (8), vol. 8, p. 448.

#### TABLE TO THE SPECIES OF JUGURTIA

Meade-Waldo: Ann. Mag. Nat. Hist., (8), vol. 8 (1911), p. 449 (*chlorotica* omitted).

#### Genus *Masariella* Brauns

Figures 5, 40, 41, 106

*Masaris* auct. pars.

1905. *Masariella* Brauns. Ann. Hist. Nat. Musei Nat. Hungarici, vol. 3, p. 223.

♂. Head transverse rounded, the posterior margin of the vertex somewhat concave; temples moderately broad, margined posteriorly; ocelli distant from the eyes, these very deeply emarginate, the emargination broadly rounded at apex; clypeus like that of *Pseudomasaris* gibbous, or merely convex, the anterior margin deeply and broadly concave; the labrum prominent, short, rounded at apex; mandibles acute, with one or two teeth within; ligula elongate, retractile, like that of *Masaris*; labial palpi, 4-segmented, the apical segment, minute; maxillary palpi said by Brauns to be 2-segmented. Antennae of the genotype consisting of 12 segments, gradually enlarged into a long oval club from the sixth segment to the apex, flattened but not concave beneath, the club terminating in a slight hook and not distinctly demarcated from the rest of the flagellum, the divisions between all segments distinct, except that the one between the last two is largely obliterated, the scape a little longer than the third segment, more than twice the length of the pedicel; the antennae of *saussurei* are different, the club short, broadly ovate, convex, commencing with the ninth segment.

The rather long neck, and the shape of the head and prothorax are suggestive of *Xiphydria*; the humeri entirely rounded, parapsidal furrows absent; scutellum in the genotype with a median furrow and ending in two tubercles, in *saussurei*, however, simply longitudinally concave; tegula elongate, bluntly rounded, not pointed posteriorly, covering the base of the scutellum, its outer margin entire, coarsely punctured; propodeum concave posteriorly, its side rounded, not carinate, but superiorly mucronate or dentate.

Medio-cubital cross-vein opposite  $M_4 + Cu_1$ ; anterior trochanter unarmed; the tarsal spur arcuate, simple; the tarsus not much shortened and flattened; femora and tibiae with simple surfaces; middle tibia in the genotype with one large apical spur beneath and an additional short stout spine at apex on the upper side; in *saussurei*, there are two stout spurs beneath and one above; the posterior tibial spur, bifid as in *Pseudomasaris*; claws with a small tooth beneath near the base.

Abdomen cylindrical, the last dorsal segment unarmed, the apical margin broadly emarginate; ventral segments unarmed, the seventh of the genotype with a deep depressed pocket at base extending beneath the sixth segment, its apex except in *saussurei* broadly, not deeply rectangularly emarginate, the apical border in the middle of the emargination produced into two teeth with a deep rounded notch between.

Genitalia not examined.

♀. Differs from the male in the following particulars: clypeus convex but not gibbous; antennae much shorter, the segments of the flagellum short, forming a compact oval club, not unlike that found in females of *Pseudomasaris*; spur of anterior tibia shorter and broader; anterior tarsus shorter and flattened; abdominal segments as in female *Pseudomasaris*, the apical segments unarmed and broadly rounded at apex. I have not dissected the mouth parts, but the labial palpi have three segments, the third equal to the second, and bearing one or more stout curved spines near the apex, and there may be a fourth segment represented by a minute tubercle; the maxillary palpi I cannot make out.

*Type*.—*Masaris alfkeni* (Du Buysson), genus monobasic.

*Habitat*.—South Africa.

#### KEY TO THE SPECIES OF MASARIELLA

##### Males

- Club of antenna elongate, oval, not sharply differentiated from rest of flagellum, slightly hooked at tip and flattened beneath; seventh ventral segment with a conspicuous deep basal pocket, extending beneath the sixth, its apical margin broadly rectangularly emarginate, in the middle with two teeth separated by a deep and rounded median notch ..... *alfkeni* (Du Buysson).
- Club of antenna very short, broadly ovate, convex beneath, shaped as in *Pseudomasaris texana*, the tip bluntly rounded, not hooked; seventh ventral segment slightly produced and truncate at apex, considerably obscured by numerous long silky hairs at its base with a weakly marked shallow pocket extending beneath the sixth segment ..... *saussurei* Brauns.

*Females*

Propodeum with posterolateral angles weakly angled above but not dentate; scutellum with a discal depression, not ending in two tubercles .....

.....*saussurei* Brauns.

Propodeum with its posterolateral angles dentate above; scutellum with a longitudinal median fossa and ending in two tubercles.....*alfkeni* (Du Buysson).

*M. saussurei* undoubtedly is more closely related to *alfkeni* than it is to the genotype of *Masaris*, in which genus it has heretofore stood, as the following considerations will show. In *Masaris* the ventral segments two and three are both armed with strong processes, in *alfkeni* is probably more like it than that of *saussurei*; the ocelli of the ment is elongate, tapered, and ends in two prominent tubercles or teeth, while in both *alfkeni* and *saussurei* it is short and rounded, the apical margin broadly emarginate; in both *alfkeni* and *saussurei* the larger spur of the hind tibia is bifid, but not so in *Masaris*. Neither the antenna of the male of *alfkeni* or *saussurei* is like that of *Masaris*, but *alfkeni* is probably more like it than that of *saussurei*, the ocelli of the male of *Masaris* are close to the eyes, those of both *saussurei* and *alfkeni* much more distant, this character being due to the much closer approach of the eyes to each other on the vertex in *Masaris*; the post-scutellum of *Masaris* is not covered by the scutellum, and is bifid, while in both *saussurei* and *alfkeni* it is entirely covered by the scutellum and rounded, and finally, the subulate lateral angles of the propodeum are of a very different type from that which obtains in both *alfkeni* and *saussurei*.

It is probable that the other South African species now placed in *Masaris* will go in *Masariella* also, but as I have not seen specimens I cannot say. It is further probable that after the species have been thus studied it may become desirable to erect a separate subgenus for *saussurei* and probably others on the basis of the difference in the antennae and seventh ventral segment of the male.

## SPECIES

*alfkeni* (Buysson) Brauns, ♂, ♀. South Africa.

1904. *Masaris alfkeni* Buysson, ♀. Bulletin de la Société Entomologique de France, p. 144.

1905. *Masariella alfkeni* Brauns, ♂, ♀. Annales Historico-Naturales Musei Nationalis Hungarici, vol. 3, p. 223.

*saussurei* Brauns, ♂, ♀. Cape Colony.

1905. *Masaris saussurei* Brauns, ♂, ♀. Annales Historico-Naturales Musei Nationalis Hungarici, vol. 3, p. 219.

Genus *Quartinia* Gribodo

1904. *Quartinia* Cameron. Zeitschrift für systematische Hymenopterologie und Dipterologie, vol. 4, p. 89.

♂. Head broad, transverse, the eyes very distant from each other and from the ocelli; somewhat, as in the females of *Pseudomasaris*, deeply incised, the incision broadly rounded, clypeus convex; its apex broadly emarginate; mandibles acute, a tooth on the inner margin near the apex. Antennae shorter than the distance between the eyes on the top of the head, resembling those of *Pseudomasaris* females; the scape is scarcely longer than broad, the pedicel very large, globose, nearly as large as the scape, the third and following segments minute, the eighth and twelfth united into an oval club, convex on all surfaces.

Humeri rounded, parapsidal furrows wanting, mesonotum flattened but not depressed in front of the slightly raised scutellum; tegula very large, considerably larger than the scutellum, very broadly rounded rather than pointed posteriorly, covering the base of the scutellum, with a few coarse punctures on the posterior part, this convex, rounded at apex where it covers the rounded postscutellum; propodeum posteriorly deeply concave, the margins thereof forming a sharp ridge separating the posterior from the lateral surface, but not carinate and without spine or tooth.

Forewings completely plaited longitudinally as in *Celonites* or *Vespa*; the medio-cubital cross-vein attached opposite to  $M_4 + Cu_1$ ; in *variegata* veins,  $M_2$  and  $m$  appear as a mere trace, but not in the genotype, a completely enclosed and very large triangular appendiculate cell present. Anterior trochanter unarmed; middle tibia with two weak apical spurs. I cannot make out the posterior tibial spur of *variegata*, but in *deleta* ♀ it appears to be slender and acute; claws small, apparently with a minute tooth beneath.

Abdomen shaped as in *Vespa*, the last dorsal segment short and rounded, its apex margined and deeply bifid; apical margin of last ventral segment sinuate with a broad median tooth.

♀. Except in the broadly rounded last abdominal segment the female does not differ from the male.

The generic description is drawn chiefly from *Q. variegata* Brauns, but the ♀ of the genotype was compared with it. It is not clear, however, that in the latter the wings are longitudinally plaited, and the extent of the wing margin caudad of cell  $M_3$  is much less than in *variegata*.

*Type*.—*Quartinia dilecta* Gribodo, genus monobasic.

*Habitat*.—Africa, India.

## SPECIES OF QUARTINIA

*capensis* Kohl. Algo Bay.

1898. *Quartinia capensis* Kohl. Termeszetradi Füzetek, vol. 21, p. 365.

*dilecta* Gribodo, ♂, ♀. Tunis.

*indica* Cameron. Deesa.

1904. *Quartinia indica* Cameron. Zeitschrift für systematische Hymenopterologie und Dipterologie, vol. 4, p. 89.

*major* Kohl. Oran.

1898. *Quartinia major* Kohl. Termeszetradi Füzetek, vol. 21, p. 363.

*paradoxa* Brauns, ♂. Cape Colony.

1905. *Quartinia paradoxa* Brauns. Annales Historico-Naturales Musei Nationalis Hungarici, vol. 3, p. 324.

*parvula* Dusmet, ♂. Spain.

1908. *Quartinia parvula* Dusmet. Mem. Pri. Congr. Nat. Espan., 1908, p. 183.

*thebaica* Buysson. Egypt.

1902. *Quartinia thebaica* Buysson. Bulletin de la Société Entomologique de France, 1902, p. 141.

Genus *Celonites* Latreille

Figures 7, 22, 34, 35, 52, 87-90, 104

1906. *Coelonites* Du Buysson. Revue entomologique, vol. 25, p. 103.

♂. Head transverse, posterior surface flat; occiput margined; temples wanting; eyes deeply emarginate, the emargination broad and rounded, distant from each other by three-quarters the length of the scape; ocelli in a very broad triangle, situated well up on the vertex, the posterior much closer to the eyes than to each other; front convex, without tubercles; clypeus strongly convex, shield-shaped, emarginate anteriorly; mandibles acute, with two small preapical teeth on the inner margin; ligula very long, slender and retractile; the labial palpus consisting of a single segment, the apical portion of which is partially marked off as a short incomplete second segment; maxillary palpus consisting of two short, slender segments. Antenna a little shorter than the thorax, strongly clavate; the scape and pedicel of nearly equal length, globose, the third segment cylindrical, a little longer than the pedicel, nearly as long as segments 4 to 5, these as broad as long, 6 and 7 broader than long, segments 8 to 12 fused into a solid, large, oval club, convex above and slightly flattened below, the divisions between the segments distinct beneath; the ninth and tenth segments in a depression beneath bear the cupuliform organs described by Saussure.

Humeri angulate; parapsidal furrows wanting; tegula long, covering the base of the scutellum, pointed, the outer margin weakly sinuate; scutellum rather flat; propodeum raised on each side near its base, the sides horizontally strongly alate.



Wings longitudinally plaited as in *Vespa*; cells  $R_4$  and  $R_5$  of the forewing united; m-cu arising from  $Cu_1$ . Anterior trochanter simple, the front tibia with a ridge beneath, but otherwise the femora and tibiae are without irregular or carinate surfaces; anterior tibial spur of a peculiar shape, stalked at base, the apical portion triangular, acute; middle tibia with two apical spurs; larger apical spur of posterior tibia bifid at tip; all claws with a minute tooth well toward the base of each.

Abdomen entirely sessile, fitting close against the alate angles of the propodeum, convex above, tapered toward apex, concave beneath, the sides strongly margined; the posterolateral angles of segments 1 to 6 produced into a flattened rounded tooth, giving the margins a serrate aspect; last dorsal segment with its margin notched, resulting in 4 teeth; last ventral segment with its apical margin shallowly concave.

Genitalia of the peculiar type shown in figure 52.

♀ differs from the male as follows: club of the antenna more slender, convex beneath and without the cupuliform organs; mandible blunt, the inner margin near the apex indistinctly serrulate; labial palpus of three segments, the first stout, curved, with a ventral row of four apical setae, the second short, with two setae of which one is very prominent, the last segment about one and one-half times as long as the second, curved, slightly widened toward the apex, obtuse, with a row of setae extending obliquely across the apex, of which four or five are stout. Wings strongly plaited as in the male; anterior tibial spur curved, slender throughout, or very slightly widened toward the tip; hind tibial spur as in the male; last dorsal segment with its margin merely weakly sinuate; the last ventral segment large, obtusely pointed at apex, with a median longitudinal ridge.

*Type*.—*Masaris apiformis* Fabricius; genus monobasic.

*Habitat*.—Mediterranean subregion, Africa.

The difference between the sexes in the labial palpi closely parallels that found in *Pseudomasaris*, the condition in the corresponding sexes being very similar in each genus. The labial palpi are described by Saussure as of four segments, but this is true of neither sex. That author did not observe the sexual disparity in the palpi, nor has it been previously recorded by any author, so far as I am aware. In respect to the bifid spur of the posterior tibia this genus is also similar to *Pseudomasaris*, but of course in many other characters it is very different.

The generic description is drawn from a study of the type species alone, and it is of course possible that other species may modify it.

## LIST OF SPECIES OF CELONITES

- abbreviatus* (Villers) Saussure, ♂, ♀. Mediterranean subregion.  
1793. *Masaris apiformis* Fabricius.  
var. *hungaricus* Mocsarya, ♂, ♀. Hungary.  
*andrei* Brauns, ♂, ♀. Cape Colony.  
1905. *Celonites andrei* Brauns, ♀. Annales Historico-Naturales Musei Nationalis Hungarici, vol. 3, p. 228.  
1913. *Celonites andrei* Brauns, ♂. Entomologische Mitteilungen, vol. 2, p. 206. Description of male and of nest.  
*capensis* Brauns, ♂, ♀. Cape Colony.  
1905. *Celonites capensis* Brauns, ♀. Annales Historico-Naturales Musei Nationalis Hungarici, vol. 3, p. 231.  
1913. *Celonites capensis* Brauns, ♂. Entomologische Mitteilungen, vol. 2, p. 205.  
*clypeatus* Brauns, ♀. Cape Colony.  
1913. *Celonites clypeatus* Brauns, ♀. Entomologische Mitteilungen, vol. 2, p. 206.  
*crenulatus* Morawitz, ♀. Transcaspia.  
*cyprius* Saussure, ♂. Cyprus.  
*fischeri* Spinola, ♂, ♀. France, Algeria.  
1906. *Celonites fischeri* Du Buysson. Revue Entomologique, Caen, vol. 25, p. 103.  
*jousseamei* Du Buysson. Obock.  
1906. *Coclonites jousseamei* Du Buysson. Revue Entomologique, Caen, vol. 25, p. 104.  
*mongolicus* Morawitz, ♂, ♀. Mongolia.  
*montanus* Mocsarya.  
1906. *Celonites montanus* Mocsarya. Annals and Magazine of Natural History, vol. 4, p. 198.  
*osseus* Morawitz, ♀. Transcaspia.  
*promontorii* Brauns, ♂, ♀. Cape Colony.  
1905. *Celonites promontorii* Brauns, ♀. Annales Historico Naturales Musei Nationalis Hungarici, vol. 3, p. 232.  
1913. *Celonites promontorii*, ♂. Entomologische Mitteilungen, vol. 2, p. 205.  
*purcelli* Brauns, ♂, ♀. Cape Colony.  
1905. *Celonites purcelli* Brauns. Annales Historico-Naturales Musei Nationalis Hungarici, vol. 3, p. 226.  
1913. *Celonites purcelli* Brauns. Entomologische Mitteilungen, vol. 2, p. 205.  
*rothschildi* Du Buysson. East Africa.  
1906. *Coclonites rothschildi* Du Buysson. Revue Entomologique, Caen, vol. 25, p. 105.  
*savignyi* Saussure, ♂, ♀. Egypt.  
*wheeleri* Brauns, ♂, ♀. Cape Colony.  
1905. *Celonites wheeleri* Brauns. Annales Historico-Naturales Musei Nationalis Hungarici, vol. 3, p. 230.

var. *immaculatus* Brauns.

1905. *Celonites wheeleri* var. *immaculatus* Brauns. *Loc. cit.*, p. 230.

1913. *Celonites wheeleri* var. *immaculatus* Brauns. *Entomologische Mitteilungen*, vol. 2, p. 205.

#### TABLES TO SPECIES

South Africa.

Brauns, Hans. *Entomologische Mitteilungen*, 1913, vol. 2, p. 207.

Mediterranean subregion.

André, Edmond. *Species des hyménoptères d'Europe et d'Algérie . . .*, vol. 2, pp. 826-829. *Tabulates abbreviatus*, *fischeri*, and *cyprius*.

#### Genus *Masaris* Fabricius

Figures 18, 28, 29, 30, 49-51, 83, 95, 107.

♂. Head transverse; the occiput immargined; temples narrow; eyes large, distant from one another above by little more than the distance between the hind ocelli, with a triangular emargination, the apex of which is obtuse; ocelli in an equilateral triangle, crowded forward, distant from the occiput, the hind pair almost touching the eyes; front comparatively flat, with neither tubercles nor a ridge; clypeus moderately convex, its anterior edge deeply emarginate; mandible acute, the inner edge with two preapical teeth, the more apical one fair sized; labial palpus with four segments, the apical segment very short; maxillary palpus reduced to a single segment represented by a mere tubercle. Antenna longer than head and thorax united, gradually widened into an oval club, which is convex on all sides; the scape subglobular; the pedicel short, segments 3 to 5 elongate, cylindrical, 6 and 7 gradually evenly widened, longer than broad; segments 8 to 12 fused, but the divisions distinguishable.

Humeri marked by a ridge; parapsidal furrows absent; tegula elongate, reaching over the base of the scutellum, the apex obtuse, the outer margin weakly and broadly emarginate mesally; scutellum convex; postscutellum prominent, bifid at apex; propodeal angles horizontally subulate, forming acute angles.

Forewing not plaited; lacking  $R_4$ ; m-cu arising from  $M_1$ . Anterior trochanter unarmed; all femora and tibiae with regular surfaces, some of them slightly flattened and with a weak ridge beneath, but devoid of tubercles and carinae; anterior tibial spur slender, slightly curved, the tip acuminate and bent outward; middle tibia with two stout spurs; longer spur of the posterior tibia pectinate at apex (see fig. 95); tarsal claws each with a minute tooth on the middle of the inner margin.

Abdomen sessile, slender, broadest at base, the first segment from a dorsal view somewhat concave anteriorly, the second to fifth dorsal segments somewhat contracted at base, the last bidentate and deeply notched at apex; second and third ventral segments each with a process, that of the second acute, of the third larger and transverse; last ventral segment with the apical margin weakly concave.

Squama simple, obtuse; sagitta thick, short, roughly trigonal; uncus slender, acute, decurved. The genitalia are similar in type to *Pseudomasaris*.

I have not seen a female. The description is drawn from a male of the type species, subspecies *aegyptiacus*.

*Type*.—*Masaris vespiformis* Fabricius, by designation of Latreille, 1810.

*Habitat*.—Africa.

#### SPECIES OF MASARIS

*discrepans* Brauns, ♂, ♀. Cape Colony.

1913. *Masaris discrepans*, Brauns, ♂, ♀. Entomologische Mitteilungen, vol. 2, p. 203, pl. 2, fig. 9a.

[*saussurei* Brauns, ♂, ♀. Cape Colony. See *Masariella*.]

*spinolae* Saussure, ♀. Cape Colony.

*vespiformis* Fabricius, ♂, ♀. Egypt, Algeria.

1911. *Masaris vespiformis* Meade-Waldo. Annals and Magazine of Natural History, (8), vol. 8, p. 445, illus.

subspecies *aegyptiacus* Meade-Waldo, ♂. Egypt.

1911. *Masaris vespiformis* subspecies *aegyptiacus* Meade-Waldo, ♂. Annals and Magazine of Natural History, (8), vol. 8, p. 447, illus.

#### Genus *Pseudomasaris* Ashmead

Figures 6, 10, 19–21, 31–33, 96, 108.

1902. *Pseudomasaris* Ashmead. Canadian Entomologist, vol. 34, p. 221.

♂. Eyes deeply emarginate; mandibles acute, with two minute denticulations on the inner margin; clypeus convex, the apical margin broadly emarginate; glossae very elongate, retractile, about 7 times as long as the paraglossae; labial palpus usually 2-segmented, rarely 1- or 3-segmented, in which case the first segment is much longer than the following, and the third if present is stout and shorter than the second, the second segment may be indistinctly separated from the first; maxillary palpus reduced to a single segment, usually a mere tubercle, sometimes exceedingly minute; a distinct lacinia present, with a ciliate inner margin, also a subgalea and sometimes what probably represent two lobes of the galea, sometimes only one. Segments 8 to 12 of the antennae closely fused into a club, which may be concave or convex beneath, and is of varying shape; scape short, nearly globular, pedicel short, segments 3 to 5 linear, the sixth and seventh sometimes widened, occasionally much so.

Tegula elongate, the outer margin notched; parapsidal furrows absent.

Anterior trochanter unarmed; tarsal claws simple; middle tibia with one apical spur; posterior tibial spur bifid. Forewing with cells  $R_4$  and  $R_5$  coalesced (2 submarginal cells); m-cu arising from  $M_4$ .

Abdomen sessile, the second, third, and fourth dorsal segments constricted at base, the last dorsal decurved, its apex, seen from the side,

truncate, the truncate portion from a caudal view nearly rectangular, margined above and below by a pair of strong, tooth-like processes, the inferior pair closer together than the superior, sometimes an additional pair of tubercles cephalad of the upper pair; second ventral with a low tubercle, the third with a strong, variously shaped, process; seventh ventral segment deeply divided by a usually square broad notch. Squama and ramus fused, the former lamelliform, rarely thickened, curved, often densely ciliate beneath; sagitta and volsella small, closely applied to the ramus; uncus usually long and slender, decurved at apex, with a pair of barbs at base, sometimes thick and without barbs at base.

♀. Eyes deeply emarginate, the emargination wide and rounded at apex, eyes at least 3 times as far apart above as the distance between the hind ocelli; mandibles bluntly rounded or truncate at apex, with 2 denticulations on the inner margin; labial palpi 3-segmented, the first flattened, the second short, bent at right angles to the second, the third much longer, falcate, very slender, tipped with 2 stout spines. Antennae shorter than the width of the head; scape more than twice as long as pedicel; third segment linear, as long as 3 or 4 following segments united, segments 4 to 7 increasingly thickened, the seventh broader than long, segments 8 to 12 fused into an oval club, convex above and below, the divisions distinguishable, but that between the eleventh and twelfth sometimes very indistinctly so.

Abdomen unarmed. The segments not constricted at base, the seventh tergite and sternite with rounded apical margins. In other respects similar to the male.

*Type*.—*Masaris occidentalis* Ashmead, by original designation.

*Habitat*.—Southwestern United States.

#### KEY TO THE SUBGENERA OF PSEUDOMASARIS

- A. Posterior metatarsus of the male arcuate, produced at apex on the inner side into a lobe bearing a prominent crest of ciliae; segments 6 and 7 of the antennae of the male much longer than wide, the club shaped like the inverted bowl of a spoon, concave beneath; anterior tarsus of the male ciliate; anterior tibia and middle femur and tibia of the male contorted, of the female merely flattened beneath, the tibiae constricted at base; posterolateral angles of the propodeum alate; last dorsal segment of the male with 6 tubercles; female with a transverse carina between the antennae; squama very thick, the apex rugose ..... *Toryna*, n. subg.
- AA. Posterior metatarsus straight or nearly so, without an apical lobe; club of the male convex beneath, or if concave it is short ovate, not spoonlike, the seventh segment as broad as long, or the sixth and seventh segments form part of the club, the inner margin of which is serrate, and the seventh segment much broader than long; female without a carina between the antennae; last dorsal segment of the male with 4 tubercles; squama laminate or slightly thickened, the apex even.
- B. Eyes of the male reaching the posterior margin of the head, touching each other on the vertex, or separated by a distance less than that between the posterior ocelli; these touching the eyes, 3 times as far



from an imaginary line connecting the posterior borders of the eyes as from each other; seventh segment of antenna of male slightly widened at apex, much longer than broad, the club solid, ovate, shorter than segments 6 plus 7, convex above and below, slightly flattened at base beneath; middle femur and tibia with even surface, rounded or flattened but not concave beneath and without irregularities .....

.....**Holopticus**, n. subg.

BB. Eyes of the male not reaching the posterior margin of the head, distant from each other by at least twice the distance between the posterior ocelli; these not touching the eyes, distant from an imaginary line connecting the posterior borders of the eyes by not more than twice their distance from each other; antennae of the males of different forms; either the middle femur or tibia or both of the male irregularly contorted, grooved or armed beneath, sometimes also that of the female, but less strongly than in the male.

C. Antennal club of the male solid, ovate, thick, sometimes hollowed beneath, as long as or slightly longer than segments 6 plus 7, these not forming part of the club, the seventh segment at least as long as broad, usually longer; inner surface of squama of male not fimbriate .....**Pseudomasaris** Ashmead.

CC. Sixth and seventh segments of the antenna of the male forming part of the club, the remaining segments indistinguishably fused, recurved like a half-closed hand, concave beneath, this part of the club scarcely longer than the sixth segment, posterior margin of the club strongly serrate, by reason of the irregularly projecting margin of the sixth and seventh segments, the seventh segment more than 3 times as broad as long, less than one-third the length of the sixth; inner surface of the squama of the male fimbriate .....

.....**Cotyledon**, n. subg.

#### A KEY TO THE SPECIES OF THE GENUS PSEUDOMASARIS

##### Males

1. Last dorsal segment with 6 tubercles; posterior metatarsus curved and with a ciliate lobe at apex within; antenna resembling an inverted spoon .....(**Toryna**) **vespoides** (Cresson).  
Last dorsal segment with 4 tubercles; posterior metatarsus without a lobe .....(2)
2. Sixth and seventh segments of the antenna forming part of the club, the seventh flattened, over 3 times as broad as long, their irregular edges making the posterior margin of the club strongly serrate; front with a prominent tubercle between the emarginations of the eyes .....  
.....(**Cotyledon**) **edwardsii** (Cresson).  
Sixth and seventh segments of the antenna not forming part of the club, or if so the seventh is cylindrical and but little widened, the seventh segment as long as broad, or longer, club short ovate and thick, rarely hollowed beneath, the posterior margin not serrate; front flat, or with a weak median prominence .....(3)

3. Eyes reaching the posterior margin of the head, closer together than or about as close together as the distance between the posterior ocelli, these touching the eyes or very nearly so.....(**Holopticus**). (4)  
Eyes not reaching the posterior margin of the head, at least twice as far apart as the distance between the hind ocelli; these not touching the eyes ..... (**Pseudomasaris**). (8)
4. Eyes separated by from three-quarters to one and one-half times the diameter of a posterior ocellus; fourth segment of antenna linear; process of third ventral segment with a broad longitudinal fossa on its summit, without two teeth in front, and without a posterior tooth.... (6)  
Eyes separated by twice or three times the diameter of a posterior ocellus ..... (5)
5. Process of third ventral segment with a narrow longitudinal groove on its summit, two teeth in front, and a large sharp tooth pointing caudad behind; eyes separated by twice the diameter of a posterior ocellus.....  
.....**bariscipus**, n. sp.  
Process of third ventral segment with a broad fossa on its summit much widened anteriorly, the process without teeth in front and obtuse behind; eyes separated by three times the diameter of a posterior ocellus .....  
.....**phacelliae** Rohwer.
6. Eyes separated by less than the diameter of a hind ocellus ..... (7)  
Eyes separated by about one and one-half times the diameter of a hind ocellus; front femur black and yellow .....**rohweri**, n. sp.
7. Anterior femur brown with a white area beneath at apex; sides of propodeum weakly angled, not alate nor mucronate.....**albifrons** Rohwer.  
Anterior femur usually entirely red or reddish yellow without an apical white spot; side of propodeum subulate and mucronate .....  
.....**texanus** (Cresson).
8. Sixth and seventh antennal segments not flattened beneath, the sixth cylindrical or slightly widened at apex, the club convex beneath, middle femur and tibia or the tibia only strongly contorted and concave beneath ..... (9)  
Sixth and seventh antennal segments flattened beneath, strongly widened, the club concave beneath; middle femur concave beneath, with a tubercle near the apex, the tibia slightly irregularly concave beneath .....  
.....**marginalis** (Cresson).
9. Middle femur and tibia both strongly contorted and concaved beneath; seventh segment of the antenna three-quarters as wide as long..... (10)  
Middle femur with the inferior surface evenly rounded, the tibia on its outer lower edge strongly produced and angled on the basal third; seventh segment of the antenna one-half as wide as long .....  
.....**occidentalis** (Cresson).
10. Antenna evenly and not strongly clavate from the sixth segment to the apex, forming a slender oval club; middle tibiae weakly ridged beneath .....**coquilletti** Rohwer.  
Antenna with the club broadly ovate, strongly differentiated from the rest of the flagellum; middle tibia strongly ridged beneath .....  
.....**zonalis** (Cresson.)

## Females

1. A sharp transverse carina between the antennae; clypeus coarsely transversely rugose ..... (*Toryna*) *vespoides* (Cresson).  
 No carina between the antennae; clypeus not rugose, but chagreened or punctate ..... (2)
2. Angles of propodeum mucronate or dentate ..... (3)  
 Angles of propodeum rounded, not dentate .....  
 ..... (*Pseudomasaris*) *marginalis* (Cresson).
3. Middle tibia, seen from above, inflated beyond the middle; middle femur with its inner posterior margin carinate and more or less sinuate; color black and bright yellow..... (*Cotyledon*) *edwardsii* (Cresson).  
 Middle tibia, seen from above, not inflated ..... (4)
4. Middle femur scarcely flattened and not ridged beneath; color of the body partly tawny, ferruginous or rufous, or at least the legs beyond the coxae all tawny except sometimes for a yellow spot on the femora.. (5)  
 Middle femur flattened beneath, its anterior lower border marked by a ridge; color black and saffron or lemon yellow, without rufous or tawny markings ..... (10)
5. Clypeus very coarsely and densely punctate, almost rugose; tawny, inverted V-shaped spot on front, mesonotum except next to the tegulae, mesoventer, sometimes part of pleura and lower part of propodeum, mesal spot on dorsal segments 1, 2, and 3, and a mesally dilated basal border on dorsal segments 4 and 5, and a narrow basal border on ventral segments 4, 5, and 6, black.....  
 ..... (*Pseudomasaris*) *occidentalis* (Cresson).  
 Clypeus weakly and shallowly punctate, sometimes punctulate with scattered coarser punctures; black, with yellow and usually with rufous marking ..... (*Holopticus*) (6)
6. Middle of mesonotum just in front of scutellum very densely and finely granular-punctate; second dorsal segment closely, rather finely and evenly punctate, matte ..... (7)  
 Middle of mesonotum in front of scutellum coarsely, confluent, almost rugosely punctate, this area of the mesonotum strongly depressed; second ventral segment with separated coarser punctures, the abdomen and pronotum more or less polished and shining; color black, saffron yellow and red, with a strong preponderance of yellow on the abdomen .....  
 ..... *phacelliae* Rohwer.
7. Mesonotum just in front of scutellum with a strongly depressed area, not reaching the lateral groove of either side, this area finely granular, while the raised area at the sides and anteriorly is more coarsely and sparsely but still densely punctate; front always with a triangular white area, legs beyond coxae entirely reddish ..... (8)  
 Mesonotum in front of scutellum flat, but without a median depressed area, the sides and anteriorly finely and densely punctate, but not granular as in the middle just before the scutellum; front usually without a white spot ..... (9)
8. Thorax and abdomen with a large amount of red .....  
 ..... *texanus texanus* (Cresson).

- Thorax and abdomen without red marking ..... **texanus neomexicanus** Rohwer.
9. Front without a median white triangle; knees white; three basal abdominal segments with their ground color dorsally mostly red ..... **basirufus** Rohwer.
- Front with a median white triangle; legs beyond coxae entirely rufous; two basal segments of abdomen with ground color partly red ..... **maculifrons** (Fox).
10. Seen from behind, the middle tibia strongly contracted near its base; cephalic margin of cell  $R_{4+5}$  less than one-half the distance between  $M_{3+4}$  and  $M_2$  on its caudal border; humeral ridge well marked; abdomen elongate; propodeum except the angles, femora except their apices, postscutellum and most of clypeus black ..... **(Pseudomasaris) zonalis** (Cresson).
- Middle tibia gradually widened from base to apex; cephalic margin of cell  $R_{4+5}$  more than one-half the distance between  $M_{3+4}$  and  $M_2$  on its caudal margin; humeral ridge almost obsolete; abdomen short, ovate; propodeum, except two spots behind, femora, except basal half to three-quarters of posterior surfaces, postscutellum at apex, and most of clypeus, saffron yellow ..... **(Pseudomasaris) coquilletti** Rohwer.

**Toryna**, new subgenus

♂. Eyes deeply emarginate, the emargination obtuse, the eyes more than twice as far apart above as the distance between the hind ocelli; labial palpus 2-segmented, the first more than twice as long as the second; maxillary palpus very short and conical. Antenna a little longer than the head and thorax united, the scape short, globose, the pedicel less than one-half its length, segm. 3 to 7 distinct, 3 to 6 linear, the seventh widened, about one and one-half times as long as thick at apex, segm. 8 to 12 fused to form an oval club, shaped like the inverted bowl of a spoon, convex above and concave beneath, the divisions between these segments only faintly apparent.

Anterior femur normal, its undersurface convex, the tibia somewhat contorted, obliquely constricted at base, as long as the tarsus, the latter with a lateral fringe of rather long, silky hairs; metatarsus as long as the following segments united, the fourth segment broader than long; middle femur with irregular ridges and fossae beneath, the tibia from a lateral view constricted at base and strongly expanded toward the apex, the expansion beneath with a fossa which fits over the femur; tibia one-fifth longer than the tarsus, fourth segment of the latter much broader than long; posterior tibia as long as the metatarsus; metatarsus one and three-fifth times as long as the remaining segments united, plainly curved, its apex produced on the inner side into a rounded lobe extending well beyond the base of the following segment, and bearing a prominent crest of stout setae; hind tarsal segments 2 to 4 with a prominent inner fringe of setae; the fourth segment about as long as wide; second and third ventral segments both with tubercles;

last dorsal segment, in addition to the four tubercles bordering its truncate apex, has a pair of tubercles on the dorsal surface.

♀. A sharp transverse carina between the antennae; clypeus very convex and rugose; labial palpi 2-segmented, the first more than twice as long as the second, maxillary palpus very short and conical.

Anterior femur flattened beneath, the tibia with a weakly irregular undersurface as long as the tarsus; the latter without a fringe of ciliae; the metatarsus one-half as long again as the remaining segments united; the fourth segment broader than long; middle femur flattened beneath; the tibia slightly flattened beneath, not irregular, but constricted at base, the outer surface bearing scattered short spines, very slightly shorter than the tarsus, bearing 1 apical spine; metatarsus as long as the following segments together, the fourth about as long as broad; posterior tibia about one-third shorter than its tarsus, the apical spur bifid; metatarsus one-half as long again as the remaining segments united, not noticeably curved and without an apical lobe, the fourth segment about as long as broad.

Abdomen unarmed.

Type.—*Masaris vespoides* Cresson.

### ***Pseudomasaris (Toryna) vespoides* (Cresson)**

Figures 21, 65, 66, 67, 86, 96

1863. *Masaris vespoides* Cresson, ♂, ♀. Proceedings of the Entomological Society of Philadelphia, vol. 2, p. 287, pl. IV.  
1904. *Pseudomasaris vespoides* von Dalle Torre. Genera Insectorum, fasc. 19, p. 8  
1913. *Masaris vespoides* Davidson. Bulletin Southern California Academy of Sciences, vol. 12, p. 17 (life history).  
1913. *Pseudomasaris vespoides robertsoni* Cockerell. Proceedings of the Entomological Society of Washington, vol. 15, p. 107.

♂. Front rugosely punctured, raised below the front ocellus, with a transverse ridge between the antennae, which is polished and impunctate; clypeus very convex, its disc polished and with few large punctures, its sides with close, smaller punctures and somewhat wrinkled.

Humeri prominent, but not angled, without a distinct humeral ridge; mesonotum anteriorly closely punctate, and with a median ridge posteriorly with two lateral ridges between which it is depressed, smooth and polished, with only minute shallow and sparse punctuation; scutellum prominent, polished and practically impunctate.

Basal abdominal segments strongly constricted at base, closely and finely punctate, a median area at base of each except the first two, impunctate, polished; medial punctures finer toward the apex of each segment; second ventral segment with two anterior tubercles and two weak ones behind; third ventral segment with a strong tricuspid prominence.



Color black and pinard yellow, the latter distributed as follows: clypeus, labrum, mandibles except base and apex, inner orbits above emargination, line behind eyes, broad humeral stripe, tegula, small spot in front on tip of pronotum and within on mesonotum in front of scutellum (sometimes wanting), large spot below tegula, two short stripes on mesonotum behind (usually absent), large or small apical spot on scutellum, usually the angles of the propodeum; legs beyond middle of femora, sometimes also base of middle femora behind and spot on front and middle trochanter and coxae behind; subapical band on dorsal segments 1 to 5, varying in width and nature of its lateral incisions, the fifth usually enclosing a black spot on each side, most of sixth and apical half of seventh segments, spot at side of second and third ventral segment, sometimes prominence of third posteriorly, and nearly all of the fourth to sixth ventral segments; antennae yellow grading into deep chrome above, and marked with reddish brown beneath.

Wings stained yellow, the veins yellow (Mars yellow). Length, 17–22 mm.

The punctuation is variable, the posterior part of the mesonotum and the scutellum being sometimes punctate throughout. The color is also somewhat variable.

♀. Clypeus coarsely rugose at base; similar to the male, but yellow less extensive, the clypeus and labrum except two small spots, on each, most of mandibles and scape, hind angles of prothorax, mesonotum except spot next to tegula, scutellum except tip and angles of propodeum except the tooth, more of femora, broader basal parts of abdominal segments, nearly all of last ventral segment black, the last dorsal segment black with a large yellow spot on each side; antennal club fuscous above, Sanford brown beneath. Length, 15–19 mm.

This is our largest and most handsome species. Its biology has been described by Davidson (*loc. cit.*). It builds clay nests.

The subspecies described by Professor Cockerell from California does not appear, on comparison with other specimens from California and elsewhere, to represent more than an individual variation.

*Types*.—Lectotype, ♂: American Entomological Society, no. 2095. Allotype: American Entomological Society.

SOUTH DAKOTA: Lead City, 1 ♀ [American Entomological Society].

IDAHO: Lewiston, 1 ♂, 2 ♀; Craig's Mt., 1 ♂, 1 ♀ [American Entomological Society].

COLORADO: Pikes Peak, 1 ♂, 2 ♀ (W. J. Howard), [types, American Entomological Society]; Garden of the Gods, July 13, 1877 [U. S. National Museum]; Florissant, July 21, 1 ♀ on flowers of *Pentstemon* (T. D. A. Cockerell), [American Museum of Natural History].

NEW MEXICO: Jemez Springs, May 20, 1913, 1 ♀; June 2, 1913, 6400 feet, 1 ♂ (J. Woodgate), [Cornell University].

UTAH: Pronotetali, August 21, 1906, 1 ♀ [Cornell University]; Silver Lake, July 14, 1 ♂, 1 ♀ (H. Skinner), [American Entomological Society].

NEVADA: [American Entomological Society]; 1 ♂ [American Museum of Natural History].

CALIFORNIA: Claremont, 2 ♂, 2 ♀ (C. F. Baker), [Pomona College and Cornell University]; Redlands, 1 ♀ (G. Robertson), [type of subspecies *robertsoni* Cockerell, U. S. National Museum, Cat. no. 15529]; Pasadena, June 12, 1895, 1 ♀ (R. W. Doane), [Cornell University]; Los Angeles [U. S. National Museum]; summit of Sierra Nevada, 1 ♀ [American Museum of Natural History]; Strawberry Valley, El Dorado Co., 7 ♀, August 9, 13, 1912 (E. C. Van Dyke), [Calif. Acad. Sci. and Cornell Univ.]; Fallen Leaf Lake near Lake Tahoe, 1 ♂, July 19, 1915 (L. S. Rosenbaum), [Calif. Acad. Sci.]; Carrville, Trinity Co., 1 ♂, 1 ♀, June 29, 1913 (E. C. Van Dyke), [Calif. Acad. Sci. and Cornell Univ.].

### *Holopticus*, n. subgenus

♂. Eyes deeply emarginate, emargination very narrow or acute, eyes reaching the posterior margin of the head and almost touching above, or separated by less than the distance between the hind ocelli; labial palpi with three distinct segments, or with two, the apical portion of the second contracted but not discrete. Scape short, barrel shaped, segments 3 to 6 cylindrical or with apices nodose, seventh widened at apex, twice as long as wide, 8 to 12 indistinguishably fused in a solid ovate club, convex above and below, not as long as segments 6 to 7.

*Angles of the propodeum dentate*.—Anterior tarsus with ciliate hind margin; all femora with surface regular and convex throughout; anterior tibia regular; middle tibia somewhat depressed and flattened beneath but not contorted nor with irregularities, two-thirds as long as the tarsus, the metatarsus two-thirds to four-fifths as long as the remaining segments united, the fourth as long as wide; hind tibia three-quarters as long as the tarsus; the metatarsus straight, without an apical lobe, as long as the following segments united; the fourth segment longer than wide.

Second ventral segment with two tubercles unarmed, the third with a large process, of variable shape, but bearing a longitudinal groove on its summit; last dorsal segment with four tubercles, the inferior pair small and close together.

♀. Front without a carina between the antennae, clypeus not rugose.

Legs as in the male, except the middle metatarsus is about equal to the remaining segments united.

*Type*.—*Masaris texanus* (Cresson).

### *Pseudomasaris* (*Holopticus*) *texanus* (Cresson)

Figures 56, 57, 58

1871. *Masaris texanus* Cresson, ♂, ♀. Transactions of the American Entomological Society, vol. 3, p. 348.

1904. *Pseudomasaris texanus* Dalle Torre. *enera Insectorum*, fasc. 19, p. 8.

♂. Spots on clypeus, spot on each side of pronotum, legs, except coxae, small median spot on mesonotum, spot on pleura, most of border of first dorsal segment, spot on each side of second and third dorsal segment, and the second and third ventral segments chestnut; segments 4 to 7 beneath except at apices, club of antenna beneath at base, spot on clypeus, upper part of front and inner orbits, upper margin of pronotum, spot in middle of mesonotum, 2 small anterior spots and 2 posterior touching the tegulae, apex of scutellum, angles of propodeum, 2 spots in red border of first dorsal segment, sides and spot in middle of second and third dorsal segments and borders of fourth to sixth, and band on the fourth and fifth ventral segments yellow.

Punctuation of front and clypeus fine and close; of mesonotum coarser, but close; the posterior part of disc of mesonotum depressed and closely punctate; scutellum closely punctate, propodeal angles mucronate. Dorsal segments moderately depressed and but scantily punctate at base, the apices finely punctate; second ventral segment without tubercles.

Squama moderately thick, obtuse, densely pubescent on the inner side, and with a small pubescent patch on the outer side at tip; sagitta trigonal with obtuse tip and sharply carinated angles, about half as long as the uncus; this long, slender, strongly but gradually decurved toward the tip, with a carina but not a barb beneath near the base.

♀. Antenna, apex of clypeus, pronotum, legs except coxae, spot on scutellum, stripe on first dorsal segment (with included yellow spot), large spot on each side of second segment, chestnut; spot on clypeus, on face, orbits, narrow upper border of pronotum, tegulae, spot on pleura, on apex of scutellum, angles of propodeum, sides and middle of apex of first dorsal segment, apical margins of remaining dorsal segments and of the ventral segments yellow, the yellow on the abdomen obscure; front except on the white spot and vertex with regular, round, dense but separated punctures, irregular and smaller behind the ocelli; clypeus with minute punctuation in addition to coarser punctures; dorsum punctured like the front, but in the depressed area before the scutellum densely granular punctate; abdomen opaque, densely finely and evenly punctate.

*Types*.—Holotype: ♂. American Entomological Society, no. 2100. Allotype: American Entomological Society.

TEXAS: 3 ♂, 2 ♀ (Belfrage), [American Entomological Society]; Austin, 1 ♀, May 5, 1901 (C. T. Bruers), [Jos. Bequaert].

ARIZONA: Phoenix, 1 ♂ [Dr. Jos. Bequaert].

#### SUBSPECIES *Neomexicanus* Rohwer

1912. *Pseudomasaris zonalis neomexicanus* Rohwer, ♀. Proceedings United States National Museum, vol. 41, p. 452.

♀. Black with the following parts straw yellow: wedge-shaped spot on clypeus, triangular spot on middle of frons, spot filling incision of eyes, posterior orbits narrowly to a point opposite incision of eyes,

large oval spot on sides and narrow posterior border of pronotum, tegulae, lateral posterior spot on mesoscutum above tegulae, superior spot on pleura, apical spot on scutellum, spot on angles of propodeum, broad apical bands on tergites one to five inclusive, incised laterally on tergites three, four, and five, interrupted preapical band on sixth tergite, interrupted apical band on second, complete on third and fourth and four apical spots on fifth sternites; the following parts burnt sienna: mandibles, antennal club beneath and legs below coxae; following parts piceous: flagellum except where mentioned and apical margin of sixth sternite; wings slightly smoky, the costa castaneous, the other veins dark brown; hair of head and thorax blackish.

Front dull, with large separate punctures which are much closer medially; clypeus finely punctulate with a few large punctures dorsally. Humeri rounded; pronotum with separated punctures; mesonotum with large, sometimes confluent punctures which are closer and finer in the flattened posterior part; scutellum with large, distinct punctures laterally and with a rather narrow granular area medianly; sides of the pronotum mucronate, not carinate. Abdominal segments evenly, finely and closely punctate; bases of second and third tergites somewhat contracted. Length, 10 mm.

*Type*.—U. S. National Museum, no. 14145.

NEW MEXICO: Aztec, May 4, 1899, 1 ♀ at flowers of *Astragalus* [type, U. S. National Museum].

Mr. S. A. Rohwer has very kindly sent me the redescription of the type here published.

### ***Pseudomasaris (Holopticus) albifrons* Rohwer**

1912. *Pseudomasaris albifrons* Rohwer, ♂. Proceedings United States National Museum, vol. 41, p. 451.

“♂. Length about 12 mm. Very like *texanus* (Cresson), from which it may be separated by the following characters: very few large punctures on the front and these not sharply defined; posterior part of mesoscutum uniformly punctured (in *texanus* the depressed area is more closely punctured); punctuation of abdomen finer; second dorsal segment depressed by fully half of its entire length (in *texanus* it is hardly depressed); third segment hardly depressed (in *texanus* it is depressed by fully one-third); punctures of the apical dorsal segment more widely separated; second cubital cell on the radius longer, being in the type greater than the distance between the recurrent veins (in *texanus* it is much less); markings whitish; clypeus except apical part pale; wings slightly yellowish in stigmal area, otherwise hyaline.”

*Holotype*.—U. S. National Museum, no. 14144.

NEW MEXICO: Las Cruces, 25 March, 1896, on plum (T. D. A. Cockerell), [type, U. S. National Museum].

UTAH: 1 ♂ (Palm), [U. S. National Museum].

***Pseudomasaris (Holopticus) rohweri*, n. sp.**

♂. Black, the following parts chestnut to Sanford brown; most of the fifth, sixth, and seventh antennal segments above, scape toward apex, front tibia except spot on outer side at base, front tarsus, hind and middle legs except coxae and trochanters, wing veins, second dorsal segment except for 3 yellow spots, third dorsal segment except for 3 yellow spots and base, 2 spots and median apical border on fourth dorsal segment, second ventral segment, third ventral segment except near base; following parts pale chalcedony yellow; large spot on clypeus above, emargination of eyes, upper part of front and vertex, narrow line behind the eyes, fifth and sixth antennal segments beneath except at extreme apex, antennal club beneath at base, pronotum above except posteriorly, tegulae, large spot on pleura beneath, triangular spot on each side of mesonotum in front, small median spot, spot on each side next to tegulae, apex of scutellum, angles of propodeum, spot at apex of anterior femur and base of tibia, broad subapical band on first dorsal segment, 3 transverse spots on second and third, sinuate subapical bands on fourth, fifth, and sixth dorsal segments and subapical bands on fourth and fifth ventral segments. Wing stained with yellow along costal margin; head and thorax rather noticeably pubescent.

Front prominent, clypeus gibbous, emargination of eyes very narrow, almost acute, front and clypeus shallowly and rather obscurely punctured, labial palpi with 3 segments, the last rather closely fused to the preceding. Scape globular, third segment shorter than the fourth, this not enlarged at apex, short pubescent throughout, fifth and sixth but slightly enlarged at apex, third to seventh segment somewhat compressed, the seventh much widened at apex, about twice as long as wide; club short, ovate, somewhat flattened below at base, about as long as segments 6 and 7.

Mesonotum rather coarsely and closely punctate, the depressed area more closely; the scutellum more finely and closely punctate, also with large scattered punctures, pleura with coarse punctures.

Anterior tarsus ciliate, segments of legs with regular surfaces; middle tibia flattened beneath and from an external view considerably widened medially; middle tibia about two-thirds as long as the tarsus; metatarsus slightly longer than the remaining segments united; the fourth segment slightly longer than broad; hind tibia five-eighths as long as the tarsus; metatarsus as long as the following segments united; the fourth segment slightly longer than broad. Distance from  $r$  to  $R_5$  as great as that from  $r-m$  to  $M_2$ .

Segments 2 to 5 of abdomen considerably contracted at base, distinctly punctate, punctures growing finer toward the apex; superior processes of last segment acute, prominent, curved; inferior margin of the segment with 3 minute tubercles, second ventral segment with a transverse prominence and a median groove, prominence of third segment bearing a longitudinal fossa, much broadened in front, on its summit, sloping away posteriorly, its anterior face notched at apex.



Genitalia differing from those of *bariscipus* as follows: squama slightly falcate, blunt; sagittae much longer, more slender, and with obtusely rounded apex; sagitta more slender.

*Type*.—American Entomological Society.

ARIZONA: Quartzite, April 14, 1903, 8 ♂ (G. S. Hutson), [American Entomological Society]; Phoenix, 1 ♂ [American Entomological Society].

***Pseudomasaris (Holopticus) bariscipus*, n. sp.**

Figures 77 and 85

♂. Black, following parts chestnut to Sanford brown; segments 3 to 7 of antenna at base above, club of antenna except at base beneath, apices of mandibles, anterior tibia except base on outer side, anterior tarsus, middle femur infuscated apically, middle tibia except spot at base on outer side, middle tarsus, hind leg except coxa, narrow median apical border of first dorsal segment, second dorsal segment except for three yellow spots, third dorsal segment except for three yellow spots and three black areas, median apical band on fourth segment, second and third ventral segments, and area on apex of seventh dorsal segment; the following pale clalcedony yellow: spots on mandibles, large spot on clypeus, inner orbits fused above, apex of scape, of third antennal segment above, bases of fifth, sixth, and seventh segments below, base of antennal club beneath, narrow line behind the eyes, humeri broadly, tegulae, large spot on pleura, one median and two anterior spots on mesonotum, preapical spot on scutellum, angles of propodeum, spot on front, and small spot on middle knees, broad band on first segment, 3 transverse spots on second and third, and a sinuate line near apex of fourth, fifth, and sixth dorsal segments, band on fourth ventral and three spots on fifth ventral segments; wings stained slightly yellowish, veins, ferruginous to brown.

Emargination of the eyes narrow, obtuse; front convex but not prominent; clypeus gibbous, front and clypeus closely but shallowly punctate with few large punctures; labial palpi with 2 segments, the second with its apical portion contracted but not discrete. Scape short, subglobular; third segment linear, shorter than fourth; this much widened and pubescent at apex; fifth and sixth segments also clavate but less strongly than the fourth, seventh segment companuliform, nearly twice as long as wide, club ovate, nearly as long as segments 6 and 7.

Mesonotum moderately coarsely and closely punctate, depressed area more closely punctate, disk of scutellum closely and more finely punctate, angles of propodeum acute but not mucronate.

Distance between  $r$  and  $R_5$  in excess of that between  $r-m$  and  $M_2$ . Anterior tarsus ciliate; femora and tibiae all regular, without uneven surfaces; middle tibia flattened beneath, seen from above gradually widened in middle; middle tibia about two-thirds as long as the tarsus; metatarsus nearly as long as the following segments united; fourth

segment about as long as broad; hind tibia five-eighths as long as the tarsus; metatarsus as long as the following segments united; fourth segment slightly longer than broad.

Second ventral segment with two blunt tubercles; process of third segment compressed, with a narrow groove on its summit and two anterior teeth, posteriorly it ends in a tooth directed caudad; last dorsal segment with 2 anterior processes sharp, the 2 apical ones very small and close together.

Squama obtuse, rather densely ciliate on the inner side and also exteriorly at apex; sagitta trigonal, its angles carinate, its apex acute, about one-half as long as the uncus; uncus slender, shorter than in *texanus* and less decurved.

*Holotype*.—♂, American Entomological Society.

ARIZONA: Quartzite, April 14, 1903, 8 ♂ (George S. Hutson), [American Entomological Society].

### ***Pseudomasaris (Holopticus) phacelliae* Rohwer**

1912. *Pseudomasaris phacelliae* Rohwer, ♂, ♀. Proceedings United States National Museum, vol. 41, p. 450.

“♂. Length about 13 mm. Labrum obtusely pointed; clypeus strongly uniformly convex, arcuately emarginate in apical middle, finely punctured; front with rather large, separate punctures; scape not one and a half times as long as broad, third joint distinctly shorter than fourth; anterior ocellus large, subreniform; pronotum polished, with well-separated small punctures; mesonotum with distinct, well-separated punctures, which are somewhat closer in the depressed area; mesopleura and scutellum similarly punctured; propodeum normal; abdomen polished, with widely separated punctures which become smaller posteriorly; seen from above the first dorsal is arcuately emarginate anteriorly; second, third, and fourth dorsal segment depressed basally by about one-third the length of the entire segment; processes of the third ventral and apical segments essentially as in *texanus*; second cubital on the radius slightly longer than the distance between the recurrent veins. Black except where mentioned; apical half of scape, flagellum (except apical spots on fourth and fifth joints and greater part of club), face above level of antennae (the lower margin has three indentations of black), most of clypeus, pronotum, large circular spot below tegulae, tegulae, spot above, two fan-shaped spots on anterior part of mesoscutum and a small spot in front depression, spot on scutellum and angles of propodeum yellow; abdomen with broad dorsal and ventral bands on apex of all segments reddish yellow (due in part to potassium cyanide?); legs reddish-yellow, knees yellowish; wings vitreous, hyaline, slightly yellowish in stigmal region; venation pale brown.”

♀. Black except as follows: antennae rufo-piceous; posterior orbits dorsally, narrow line on inner orbits up to and filling the eye emargination, large spot on clypeus, spot above, posterior margin of pro-

notum narrowly, and an elongate lateral spot, large spot below tegulae, tegulae, spot above, large spot in front of depression on mesonotum, most of scutellum, angles of propodeum, dorsal and ventral (except first) abdominal segments apically yellow; pronotum (except where mentioned), band on scutellum, elongate spots on second, third, and fourth segments rufous; legs rufous; wings dusky, especially near the veins; stigma and costa reddish brown, veins dark brown.

Clypeus convex, broadly emarginate, very finely granular, with large punctures intermingled; front with large distinct punctures, which are more widely separated on the eye margins and vertex; hind ocelli equidistant from the eyes and from each other; scape short, third segment of antenna as long as the three following.

Pronotum with well separated large punctures; mesonotum with punctures the size of those of pronotum, but closer and especially so in the depressed area; mesopleura more closely punctured than the mesonotum; scutellum punctured like mesopleura, with an indistinct carina medially.

Second cubital cell on the radius as long as two-thirds of the distance between the recurrent veins.

Abdomen with well separated, distinct punctures, which become smaller posteriorly; first dorsal segment slightly emarginate anteriorly when seen from above; second and third dorsal segments depressed basally for about one-third their length; apical ventral segments with the large punctures well separated. Length, 12 mm.

*Types*.—Holotype, ♂: U. S. National Museum, no. 14143. Allotype: U. S. National Museum.

NEW MEXICO: Albuquerque, May 13, 1910, ♂ on *Phacelia neomexicana* (J. R. Watson), [type, U. S. National Museum]; Mesilla, May 29, ♀ on flowers of *Phacelia* (T. D. A. Cockerell), [U. S. National Museum]; Fillmore Cañon, ♀ (T. D. A. Cockerell), [U. S. National Museum].

### ***Pseudomasaris (Holopticus) maculifrons* Fox**

♀ black, the following parts chestnut to Sanford brown: mandibles at tip, antenna beyond the fourth segment, legs, apex of first dorsal segment except for 3 yellow spots, median apical band on second dorsal segment enclosing a yellow bar, narrow median band on third and fourth segments, and the wing veins; the following pale chalcid yellow: large spot on clypeus above, triangular spot on front, emarginations of eyes, line behind eyes, humeral angles, narrow line along posterior border of pronotum, outer half of tegulae, large spot on pleura, small spots on mesonotum touching tegulae, preapical spot on scutellum, two narrow lines on postscutellum (absent on type), propodeal angles, 3 transverse bars on first and second dorsal segments, sinuate subapical band on third, fourth, and fifth dorsal segments, widened laterally, lateral spots on sixth dorsal segment, transverse interrupted and obscure band on second and third ventral segments

(only 2 lateral spots on second segment of type), transverse band occupying most of fourth ventral segment (in type 2 lateral and 2 median spots).

Front closely punctured, clypeus closely and minutely punctulate, with scattered larger punctures, posterior ocelli as far from each other as from the compound eyes.

Humeri rounded; pronotum with well separated coarse punctures; mesonotum with close coarse punctures, posteriorly finer, closer and less regular causing surface to be chagreened; scutellum similarly punctured but with coarse punctures more scattered; pleura a little more densely punctate than pronotum.

Abdominal segments densely punctate at base, punctures finer towards apex of abdomen; second and third segments slightly contracted at their bases. Length, 10 mm.

Description drawn from a specimen from Arizona.

*Holotype*.—California Academy of Sciences.

LOWER CALIFORNIA: El Paraiso [Cal. Acad. Sci.].

ARIZONA: Quartzite, April 14, 1903, 1 ♀ (G. S. Hutson), [American Entomological Society].

#### ***Pseudomasaris (Holopticus) basirufus* Rohwer**

1912. *Pseudomasaris zonalis basirufus* Rohwer, ♀. Proceedings United States National Museum, vol. 41, p. 452.

♀. Black, the following parts straw yellow: spot on mandibles, trilobed spot on clypeus, narrow line around the eyes, interrupted below the incision, mesad of the summits and posteriorly below, triangular spot on sides and narrow posterior border of pronotum, superior spot on pleura, tegulae, small spot near posterior border of mesonotum, apical spot on scutellum, spot on angles of propodeum, apex of front femora and extreme base of their tibiae externally, small spot on apex of middle femora, spot at base of middle tibiae, lengthened laterally, small anterior stripe at base of posterior tibiae, apical stripe on each side of first and second tergite, preapical mesal stripe on same, narrow apical border of third, fourth, and fifth tergites, incised laterally, broadly interrupted stripe of sixth tergite, preapical spots on second and fifth, and apical bands on third and fourth sternites; the following parts burnt sienna: flagellum except base, all of legs except yellow spots and bases of coxae, apical third to two-thirds of first three tergites, excluding yellow portions, first and second sternites and trace on third; wings slightly smoky, slightly violaceous, the veins castaneous to black.

Front closely punctured, punctures more sparse toward the eyes; clypeus finely closely punctulate, the yellow spot indistinctly so. Humeri rounded; pronotum with separated punctures; mesonotum closely, granularly punctate, more finely on the flattened posterior part; scutellum granularly punctate, more densely in the middle than on the sides; sides of propodeum mucronate, not carinate. Abdominal



segments evenly and finely, rather densely, punctate; bases of second and third segments somewhat contracted. Length, 9 mm.

*Type*.—U. S. National Museum, no. 14146.

CALIFORNIA: Death Valley, April, 1891, 1 ♀ (A. Koebele), [type, U. S. National Museum].

ARIZONA: Quartzite, April 14, 1903, 3 ♀ (G. S. Hutton), [American Entomological Society].

### Subgenus *Pseudomasaris* Ashmead

1902. *Pseudomasaris* Ashmead. Canadian Entomologist, vol. 34, p. 221.

♂. Eyes never as close together as the distance between the hind ocelli, these not touching the eyes; the temple narrow but distinct; incision of the eye sometimes subacute but usually broadly rounded at apex; front with a low tubercle between and slightly above the bases of the antennae; clypeus slightly or strongly convex, broadly emarginate anteriorly. Antennae as long or longer than the head and thorax united; scape subglobular; pedicel about one-third its length; segments 3 to 6 cylindrical or compressed and somewhat widened at their apices, the third always linear, the seventh slightly or strongly widened, sometimes more than twice as long as wide; segments 4 to 7 in one species flat beneath; club short, not or but slightly exceeding the length of the sixth and seventh segments, ovate, convex above and below or, as in one species, hollowed beneath.

Humeri entirely rounded or more or less prominent; parapsidal furrows absent; angles of propodeum dentate or only sharply carinate.

Anterior leg not contorted; surfaces of the segments uniform; femur and tibia more or less flattened beneath; tarsus in one species ciliate; middle femur with its undersurface convex and regular or contorted and concave; tibia with its undersurface convex and regular or dilated, contorted and concave, but both segments never with uniform undersurfaces in the same species; middle tibia from two-thirds to four-fifths as long as the tarsus; metatarsus two-thirds to three-quarters as long as the remaining segments together; fourth segment as broad as long or almost so; hind tibia from .6 to .8 as long as the tarsus; metatarsus without an apical lobe, approximately equal to the remaining segments united, fourth segment longer than broad.

Basal abdominal segments considerably contracted above at their bases; abdomen much decurved at apex, the last segment with its apical surface truncate, the truncature margined with 2 superior sharp or obtuse prominences and 2 inferior smaller tubercles placed closer together; second ventral segment with 2 low tubercles; process of the third high, posteriorly with an acute tooth directed caudad.

Squama obtuse without setae beneath or with a small patch of bristles; sagitta trigonal, the angles carinate; uncus usually short and blunt but in one species elongate, slender, curved, and acute.



♀. The face without a ridge between the antennae. Humeral angles sometimes subcarinate; angles of propodeum obtuse or dentate. Middle femur usually flattened beneath, sometimes ridged; the basal third of the tibia, seen from in front sometimes distinctly contracted beneath.

*Type*.—*Pseudomasaris occidentalis* Cresson (by original designation).

***Pseudomasaris (Pseudomasaris) occidentalis* Cresson**

Figures 19, 62–64, 81

1871. *Masaris occidentalis* Cresson, ♀. Transactions American Entomological Society, vol. 3, p. 348.  
1872. *Masaris occidentalis* Cresson, ♂. *Loc. cit.*, vol. 4, p. 231.  
1902. *Pseudomasaris occidentalis* Ashmead. Canadian Entomologist, vol. 34, p. 221.

♂. Color black, the following parts yellow ochre to ochraceous orange: face except at base of antennae, line between these, line including the ocelli, clypeus, labrum, mandibles, line behind the eyes, scape except at base, pedicel, third antennal segment except at sides, antennal club except apical three-quarters beneath and posteriorly, pronotum except the collar and spot in front of tegulae, tegulae, large spot below, 2 small spots on mesonotum anteriorly, most of scutellum, angles of propodeum, legs except coxae, apex of first dorsal segment, second abdominal segment except black area in middle above, third segment except dark, basal, dorsal area, fourth and fifth segments except bases, sixth dorsal except its base, sixth ventral entirely, and a band before the prominences of the seventh dorsal segment.

Emargination of the eyes, narrow, triangular, subacute at apex; hind ocelli removed from the compound eyes by considerably less than their diameter's length; front with an elevation below the anterior ocellus, below this a small longitudinal tubercle, only slightly convex with rather strong and separated punctures; clypeus very strongly convex, the punctures irregularly confluent, weaker toward the apex; labial palpi with two segments, the second segment little over one-half as long as the first, its apical part contracted and almost discrete, forming an incomplete third segment; the segment of the maxillary palpus a little longer than usual, not a mere tubercle. Segments 3 to 6 of antenna not at all enlarged at their apices; the seventh slightly enlarged at apex but more than twice as long as broad; the club oval, convex above and below, a very little longer than segments 6 + 7.

Humeral angles slightly prominent but not at all angled; pronotum rather closely punctate, medially impunctate; mesonotum with coarse and well separated punctures in front, becoming finer and closer as they approach the middle; posterior portion of the mesonotum flattened but not depressed, polished, with minute and scattered punctures; scutellum rather strongly convex, the slight anterior median ridge minutely obscurely punctuate, somewhat shining; angles of the propodeum sharply dentate; pleura coarsely punctate.

Front femur and tibia slightly flattened beneath, their surfaces not irregular, the tarsus ciliate; middle femur with regular and convex inferior surface; the tibia seen from in front with its inferior edge at the basal third strongly dilated and angulate; tibia three-quarters as long as the tarsus; metatarsus seven-tenths as long as the remaining segments together; fourth segment about as long as broad; hind tibia four-fifths as long as the tarsus; the metatarsus as long as the remaining segments united; the fourth segment slightly longer than broad. Radial cross-vein a little less distant from  $R_4$  than is  $M_{3+4}$  from  $M_2$  on the borders of the cell  $R_{4+5}$ .

First segment of the abdomen seen from above deeply concave; the abdomen closely, rather coarsely punctate at base, sparsely and more minutely at apex; truncate surface of last segment extensive, the superior processes acute, the inferior small blunt tubercles; process of the third ventral segment with a median groove on its summit, anteriorly with 2 blunt teeth.

Squama with a patch of setae on the outside but with only short, appressed and inconspicuous pubescence within; the sagitta short and stout, trigonal, the angles sharp, the apex moderately obtuse; uncus deflexed, contracted just beyond the apex of the sagitta, with a ridge but no barb beneath.

♀. Colored as in the males, except the front is black or mostly so, the mesopleura, metapleura, and propodeum more largely tawny, the mesonotum posteriorly with a medial ferruginous wash. Front and vertex closely, rugosely, behind the ocelli sparsely, punctate; clypeus very coarsely and deeply and densely punctate; mesonotum densely punctate on the flattened but not depressed posterior portion, punctulate but more or less obsoletely so in the middle, and with scattered, coarser punctures; scutellum with a weak median carina at base, sub-obsoletely punctulate, sides of propodeum sharply mucronate; abdomen opaque, very densely punctured.

*Types*.—Lectotype, ♀ [American Entomological Society, no. 2098]; allotype [American Entomological Society].

TEXAS: 2 ♂, 4 ♀ [including types; American Entomological Society]; 2 ♂, 2 ♀ [U. S. National Museum].

### ***Pseudomasaris (Pseudomasaris) marginalis* Cresson**

Figures 20, 59, 60, 61, 79, 80

1864. *Masaris marginalis* Cresson, ♀. Proceedings of the Entomological Society of Philadelphia, 3:677.

1904. *Pseudomasaris marginalis* Dalle Torre. Genera Insectorum, fasc. 19, p. 8.

♂. Black, markings on body light chalcedony yellow and on the legs and antennae amber yellow, as follows: most of clypeus, large spot above, labrum, mandibles obscurely, inner orbits above the emargination very narrowly, narrow line behind the eyes, tip of scape, third

antennal segment, fourth to seventh antennal segments except a black spot beneath at the apex of each, undersurface of club except two black spots, line on humeri, posterior border of pronotum, tegulae, small spot on angles of propodeum, legs beyond the femora and tips of these, irregular subapical band of first, third, fourth, and fifth dorsal segments; three subapical bands on second and sixth dorsal segments; the sixth and seventh antennal segments and club stained reddish; wings stained with yellow, the veins yellowish.

Posterior ocelli removed from the eye by considerably less than their diameter's length; emargination of the eyes broad, not triangular, broadly rounded at apex; front scarcely depressed beneath the median ocellus, elevated into a weak median tubercle above the bases of the antennae, its surface with separated punctures; clypeus moderately convex, its surface weakly shining, rather obsoletely punctate; labial palpi with 2 segments, the first elongate, the second about one-half as long. Fourth, fifth, and sixth segments of the antenna strongly widened at their apices, the seventh about as wide as long, the fourth and fifth flattened beneath at their apices, the sixth and seventh flattened beneath; the club short, irregularly ovate, equal in length to segments 6 and 7, convex above, slightly hollowed beneath.

Humeri rounded, pronotum laterally with well separated, rather coarse punctures; mesonotum anteriorly similarly punctate, more closely punctured in the middle, posteriorly flattened but not depressed and closely almost rugosely punctate; scutellum closely punctate, moderately convex, posterior angles of propodeum carinate but not dentate; pleura with well separated punctures.

Anterior femur and tibia with regular surfaces, somewhat flattened below, the tarsus not ciliate; middle femur concave and ridged beneath with a prominent tubercle near its apex; middle tibia with regular surface, flattened beneath, as seen from in front gradually widened from base to apex, two-thirds as long as the tarsus; metatarsus approximately equal to the remaining segments united; the fourth segment about as long as broad; hind tibia three-fifths as long as the tarsus; metatarsus equal to the remaining segments united; fourth segment slightly longer than broad. Radial cross-vein distant from  $R_4$  by little less than the distance between  $M_{3+4}$  and  $M_2$  on the margins of the cell  $R_{4+5}$ .

Punctuation of the abdomen fine and close; the surface between the processes of the last segment hardly truncate; superior process blunt, flattened, the inferior sharp, close together; prominence of third ventral segment with its summit anteriorly flattened.

Exterior surface of squama with a patch of very short, inconspicuous setae, the inner surface glabrous except for a group of 15 or 20 stout spines and a less conspicuous group of 3 or 4; sagitta acute, trigonal, the angles sharp; uncus rather long and slender, decurved and slightly widened at apex, the tip mucronate.

♀. Colored as in the male, except that the face and clypeus are black, with a triangular yellow spot between the antennae, the latter are yellow to ferruginous with most of the club fuscous.

Head closely granular, punctate, clypeus, closely punctulate with minute and coarser punctulations; dorsulum densely punctate. Propodeum with rounded, only slightly prominent angles.

Anterior tibiae short and inflated except at base, the other leg segments with even surfaces.

Dorsal segments much less constricted at their bases than in the male, opaque, and densely minutely punctulate.

The male has not been previously described.

*Types*.—Holotype, ♀, American Entomological Society, no. 2097. Allotype, ♂, American Entomological Society.

COLORADO: 6 ♂, 6 ♀ [including type; American Entomological Society]; 4 ♀ [U. S. National Museum].

NEW MEXICO: June 30, 1902, ♀ (H. L. Viereck), [American Entomological Society].

### *Pseudomasaris (Pseudomasaris) zonalis* Cresson

1864. *Masaris zonalis* Cresson, ♂, ♀. Proceedings Entomological Society of Philadelphia, vol. 3, p. 674.

1904. *Pseudomasaris zonalis* Dalle Torre. Genera Insectorum, fasc. 19, p. 8.

♂. Black, following parts Naples yellow: line entirely surrounding eyes except beneath; clypeus, labrum, mandibles, large spot on front, scape except at base, spot on pedicel, entire flagellum except reddish infuscated area at apex of club, humeri, spot on pronotum below, posterior border of pronotum, tegulae, large spot below, small transverse spot at apex of scutellum, angles of propodeum, spot on anterior and middle femur and trochanter beneath, anterior femur beneath and at apex above, middle and posterior femur at tip, all tibiae and tarsi, the latter reddish at apex, slightly incised subapical stripes on all dorsal segments, spot and truncature of the last dorsal segment, spot on sides of ventral segments 2 to 5.

Posterior ocelli distant from the compound eyes by the length of their diameter; front but slightly impressed beneath the anterior ocellus, raised above the bases of the antennae to a low tubercle, rather closely but weakly punctate; the clypeus moderately convex subobsoletely punctate; labial palpus a single long slender segment without sign of subdivision; the maxillary palpus a very small chitinized bulb. Antennal segments 3 to 5 cylindrical, not widened at their apices, the sixth slightly widened at its apex, the seventh more strongly but longer than wide; the club ovate, a little shorter than the sixth and seventh segments together, strongly convex above and below.

Humeri marked by a feeble ridge; pronotum rather closely punctate; mesonotum densely punctate, the posterior flattened portion more coarsely; scutellum moderately convex, closely punctate; pleura with large separated punctures; angles of the propodeum mucronate.

Under surfaces of anterior femur and tibia flattened, regular; tarsus not with fringe of cilia; middle femur with under surface con-



cave and contorted, as also the middle tibia, the latter with its inferior margin seen from the front inflated medially; middle tibia four-fifths as long as the tarsus; the metatarsus two-thirds as long as the remaining segments united; the fourth segment about as long as broad; hind tibia five-eighths as long as the tarsus; metatarsus nearly equal to the length of the remaining segments; fourth segment longer than broad.

Distance between  $r$  and  $R_4$  considerably less than that between  $M_{3+4}$  and  $M_2$  on the margin of the cell  $R_{4+5}$ .

First dorsal segment, seen from above, with its basal surface plane; abdomen rather finely and closely punctate, superior processes of last segment acute, the inferior, small, acute; surface between, somewhat concave; process of the third ventral segment with its summit anteriorly flattened.

Squama exteriorly with only very short inconspicuous pubescence, a small patch of setae within on the inferior margin; sagitta trigonal, long, slender, very acute, slightly curved; uncus moderately slender, slightly widened before the depressed and deflexed tip; the latter sharply acute.

♀. Colored as in the male except as noted; tip of the mandible dusky; labrum black; yellow on clypeus confined to median bar and two lateral spots; only a spot on scape and third segment of antenna yellow; humeral band confluent with spot below; pronotum, larger apical stripe on scutellum, spot on posterior coxa and more of hind and middle femora, yellow; broader stripe on each dorsal segment, broad apical stripe on second and fourth ventral segments, spots on side of sixth ventral segment yellow.

Hind ocelli little closer than their diameter's length from the compound eyes; front closely, rather coarsely punctate; clypeus shagreened with sparser, shorter, coarser, punctures. Humeri marked by a rather sharp transverse ridge; pronotum densely punctured; mesonotum very densely punctate; scutellum convex and densely punctate. Middle femur with under surface flattened, its lower anterior margin marked by a ridge; middle tibia, seen from in front, with the basal third contracted. Dorsal segments 2, 3, and 4 somewhat depressed basally; dorsal surface of the abdomen opaque, minutely, densely punctate.

*Types*.—Lectotype: ♂, American Entomological Society, no. 2099. Allotype: American Entomological Society.

IDAHO: Craig's Mt., 1 ♂ [American Entomological Society].

COLORADO: 2 ♂, 11 ♀ [including types; American Entomological Society]; 3 ♀ [U. S. National Museum]; 3 ♀ (H. H. Smith), [Cornell University].

UTAH: Salt Lake City, June 13, 1897, 1 ♂ (H. Skinner), [American Entomological Society].

NEVADA: 7 ♂, 3 ♀ [American Entomological Society].

CALIFORNIA: Giant Forest, in the Sequoia National Park, 6000-7000 feet elevation, July 21-26, 1907, 3 ♀ (J. C. Bradley), [Cornell University]; Fallen Leaf Lake near Lake Tahoe, 4 ♂, 2 ♀, July 12, 15, 1915 (E. C. Van Dyke, L. S. Rosenbaum), [California Academy of Sciences, Cornell University]; Pyramid Peak, El Dorado Co., 1 ♂,



July 8, 1912, 8000 feet altitude (E. C. Van Dyke), [Calif. Acad. Sci.]; Carrville, Trinity Co., 2 ♀, June 6, 1913 (E. C. Van Dyke), [Calif. Acad. Sci. and Cornell Univ.]; Nash Mine, Trinity Co., 1 ♀, June 13, 1913 (E. C. Van Dyke), [Calif. Acad. Sci.].

***Pseudomasaris (Pseudomasaris) coquilletti* Rohwer**

Figure 6

1911. *Pseudomasaris coquilletti* Rohwer, ♂, ♀. Proceedings United States National Museum, vol. 40, p. 555.

♂. Black, the following parts wax yellow: mandibles except tip, labrum, clypeus, stripe on front broadened at base of antennae, line all around the eyes, stripe on maxillae, antennae (shaded apically with ferruginous, the club dusky beneath), pronotum except anterior stripe and stripe in front of tegulae, greater part of mesopleura, 2 lines on mesonotum, interrupted medially, apical half of scutellum, narrow line on postscutellum, large lateral spot including angles of propodeum, front coxae beneath, trochanters, tibiae except basal spot above, front tibiae (shaded at tip with ferruginous), middle and posterior coxae, trochanters and femora, the latter with basal black stripe above, tibiae and tarsi (the apical segments ferruginous), broad apical stripe on each tergite, that on the first six separated medially from the apical margin by a narrow black stripe, two spots on first sternite and most of rest of the venter; wings stained slightly yellowish, the veins testaceous.

Emargination of eyes narrow, linear, obtuse; posterior ocelli removed from the compound eyes by less than their diameter front with a slight fovea below the anterior ocellus, terminating in a weak tubercle above the base of the antennae, closely and shallowly punctulate, the punctulation larger on the black area; clypeus strongly convex with small scattered punctures; segments 3-5 of antennae cylindrical, scarcely enlarged at their apices, six and seven each widened uniformly from base to apex, not flattened, forming the base of the slender club which is more or less convex above and below; the remaining segments fused, a little truncate at tip, together slightly shorter than segments 6 and 7.

Humeral angles rounded, marking the termination of a weak transverse ridge; pronotum with small sparse punctures; mesonotum very densely, finely, punctate, matte; posterior medial portion slightly flattened, punctate like the rest of mesonotum; mesopleura with scattered punctures; scutellum convex, densely punctate, with a median basal ridge; propodeum laterally alate and sharply dentate, the posterior margins of the alae sinuate; posterior surface of propodeum densely, finely, punctulate, its lateral surfaces impunctate, matte.

Front femur widened at basal third, tibia flattened and somewhat irregular beneath; middle femur with fossa, ridge and nodule beneath; tibia flattened beneath, the undersurface more irregular than that of front pair. Radial cross-vein about as far from  $R_4$  as  $M_2$  is from  $M_{3+4}$  on the borders of the cell  $R_{4+5}$ .

Second to fourth dorsal segments constricted basally; first segment almost flat basally; tergites densely and very finely punctate in the middle, becoming imperceptibly punctulate laterally and more sparsely but distinctly punctate basally; four processes of last segment acute, the inferior ones smaller and closer together; second sternite raised at base, the raised portion divided by a median longitudinal depressed line; process of third segment with a truncate molar-like anterior surface, posteriorly produced into an acute tooth.

♀. Black; the following parts yellow: mandibles except tip, clypeus except 2 crescent shaped spots, labrum, large triangular spot above clypeus, inner orbits convergent behind the ocelli, broad line behind the eyes, spot on scape and third antennal segment, humeri very broadly, posterior margin of pronotum broadly, tegulae, most of mesopleura, spot on metapleura, 2 longitudinal lines on mesonotum, apical half of scutellum, postscutellum, propodeum except for 2 triangular spots, all coxae and trochanters in front, femora in front and at tips behind; the anterior femur except at base behind, all tibiae and tarsi, broad subapical band on first dorsal segment, incised anteriorly, subapical band on second, third, and fourth, occupying entire segment at sides, fifth dorsal segment, sixth at base, spots on first ventral segment, second ventral segment except at base, third, fourth, and fifth ventral segments, and the sixth except at base and apex; antennal club ferruginous, yellow beneath; third, fourth, fifth, and sixth antennal segments shading from yellow into ferruginous; wings stained yellow; veins, yellow to ferruginous.

Front granular, clypeus finely so, hind ocelli equally distant from each other and from the eyes.

Humeral angles marked by a feeble ridge; dorsum granular, more finely so on the flattened portion of the mesonotum; scutellum granular, with larger scattered punctures; pleura with shallow punctures.

Middle femur flattened beneath, the anterior lower margin with a ridge; the tibia seen from in front gradually widened from base to apex, three-quarters as long as the tarsus; metatarsus nearly as long as the following segments united; posterior tibia three-quarters as long as the tarsus; this slightly exceeding the remaining segments united. The radial cross-vein distant from  $R_4$  by a little over one-half the distance between  $M_{3+4}$  and  $M_2$  on the margin of the cell  $R_{4+5}$ .

Abdomen opaque, closely punctured dorsally; second and third dorsal segments depressed at base.

*Types*.—♂, ♀ [U. S. National Museum, no. 13734].

CALIFORNIA: Los Angeles Co., April, ♂, ♀ (D. W. Coquillett), [types, U. S. National Museum]; Claremont, ♂, ♀ [Cornell University]; Southern California, 4 ♀ [American Entomological Society]; Sierra Nevada, 2 ♀ [American Museum of Natural History]; Soboba Springs, Riverside Co., 2 ♀, June 1, 1917, on *Eriodyction crassifolium* (E. P. Van Duzee), [California Academy of Sciences]; Southern Sonoma Co., 1 ♂, April 16, 1911 (J. A. Kusche), [California Academy of Sciences].

Mr. Van Duzee informs me that he observed 4 specimens at Soboba Springs, all visiting Yerba Santa, *Eriodyction crassifolium*, but was able to collect only two of these.

Subgenus **Cotyledon**, new subgenus

♂. Eyes more remote from each other than the distance between the hind ocelli, these not touching the eyes; emargination of the eye moderately narrow, the apex rounded; front with a median prominence above the base of the antennae; clypeus much broader than long, convex, deeply emarginate anteriorly; labial palpi of 2 segments, the second less than one-half the length of the first and indistinctly discrete therefrom; maxillary palpi a very minute, scarcely chitinized, bulb bearing one heavy seta and 2 more slender ones.

Scape globose; pedicel about one-third its length; segment 3 cylindrical; segment 4 a little longer, slightly and suddenly widened before its apex; segment 5 slightly gradually widened; segment 6 greatly widened toward its apex, nearly as wide as long, apical portion concave beneath and forming part of the club; the seventh segment about 3 times as wide as long; the remaining segments fused, together about as long as the sixth and seventh segments; the club formed of the sixth, seventh, and remaining segments, strongly concave beneath and with the shape of a partly closed hand.

Undersurfaces of front and middle femora and tibiae concave, contorted, and tuberculate; middle tibia and tarsus about equal in length; metatarsus as long as the remaining segments united; the fourth segment much broader than long; hind tibia about three-quarters as long as the tarsus; the metatarsus about equal to the remaining segments united, without an apical lobe; the 4th segment about as broad as long. Distance between  $r$  and  $R_4$  equal to one-third the distance between  $M_{3+4}$  and  $M_2$  on the margin of the cell  $R_{4+5}$ .

Basal abdominal segments considerably constricted; the last dorsal segment without a definitely truncate apical area but with 4 acute processes of which the inferior are the larger, closer together and slightly closer to the superior processes than to each other; second ventral segment with two rounded tubercles; the third with a prominent transverse ridge replacing the ordinary process, armed with a sharp median tooth directed caudad.

The squama densely ciliate within; sagitta short, trigonal, acute, the upper margin very deeply triangularly notched; uncus slender, deflexed, with two small barbs at base.

♀. Posterior ocelli about equidistant from the eyes and each other; eyes broadly emarginate. Humeri fitting closely around the head and marked by a prominent ridge; posterior angles of propodeum mucronate. Middle femur seen from in front, with its inferior margin sinuate, slightly inflated in the middle; middle tibia, from an external view distinctly inflated at about the middle, about three-quarters as long as the tarsus; metatarsus as long as the following segments united; fourth segment nearly as long as broad; hind tibia nearly three-quarters as long as the tarsus; metatarsus about as long as the remaining segments together; the fourth segment as long as broad.

The radial cross-vein opposite  $R_5$  or separated therefrom by a distance not greater than that between r-m and  $M_{3+4}$ . Dorsal segments 2, 3, and 4 slightly depressed at base.

*Type.*—*Masaris edwardsii* Cresson.

***Pseudomasaris (Cotyledon) edwardsii* Cresson**

Figures 10, 31–33, 78, 108

1872. *Masaris edwardsii* Cresson, ♂, ♀. Transactions American Entomologic Society, vol. 4, p. 87.  
1904. *Pseudomasaris edwardsi* Dalle Torre. Genera Insectorum, fasc. 19, p. 8.

♂. Black; the following parts mustard yellow: clypeus, labrum, mandibles, except tips, large spot on front, interior orbits, line behind the eyes, antenna except stripe on segments 3 to 5 above, and posterior part of the club above, humeri, spot below, posterior border of the pronotum, tegula, large spot below, narrow subapical line on scutellum interrupted medially, two small basal spots on propodeum, propodeal angles, spot below, spot on all coxae, anterior and middle trochanters beneath, anterior and middle femora except above at base, posterior femur at apex, extending nearly to the base in front, all tibiae and metatarsi, subapical band on first dorsal segment, three subapical bars on second, subapical band deeply incised on third and fourth, apical half of fifth, two-thirds of sixth, and half of seventh dorsal segment, except tubercles, band on second ventral segment, on the third, apical two-thirds of the fourth, fifth entirely banded, and irregular marks on sixth; wings hyaline, slightly infuscated in the cell  $2d R_1 + R_2$ ; veins ferruginous.

Front densely but rather finely punctate with an obsoletely punctate tubercle above the antennae, strongly depressed before the base of the clypeus; this obsoletely punctate, moderately convex.

Pronotum closely and rather coarsely punctate, mesonotum densely punctate, the posterior portion flattened with coarser and confluent punctuation; scutellum slightly convex, anteriorly finely, posteriorly more coarsely punctate; pleura with separated punctures.

Anterior femur with a median tubercle and ridge beneath; the posterior margin of the tibia seen from above, sinuate; tarsi depressed and broad, without a prominent fringe of cilia, segments 2 to 4 very short and broad; middle femur irregularly concave, carinate, and tuberculate beneath; middle tibia contorted, concave, and irregularly carinate beneath and in front, the anterior margin from an external view with a strong median tooth, the apex with a group of short spines in front; hind femur with a brush of dark hairs beneath at base, the surface slightly irregular.

Abdomen rather finely densely punctate; tubercles of the second ventral segment polished and shining; the surface of the fourth, fifth, and sixth ventral segments short tomentose.



Squama blunt, the inner surfaces with long coppery ciliae; uncus about two-thirds the length of the squama, slender, acute, deflexed.

♀. Coloration differing from the male as follows: labrum and two bars on the clypeus black, yellow spot on scape and segments 3 and 4 of the antenna; humeral stripe broader, confluent with spot below; pleural spot much larger; a spot on metapleura, two lines on mesonotum, apical half of scutellum, propodeum entirely except for posterior V-shaped black band, yellow; anterior coxa and trochanter and most of middle trochanter black; middle and posterior coxa yellow in front, more of posterior femur yellow; broad apical band on each dorsal segment, that on first bearing two black spots; spot on first ventral, most of second ventral, broad apical bands on following three segments, and two large spots on sixth ventral segment, yellow.

Front and clypeus granular. Humeri fitting closely behind the head, marked by a distinct transverse ridge; pronotum closely punctate; mesonotum densely punctate, posterior flattened part granular; scutellum slightly convex, finely granular; propodeal angle ending in a rather long spine. Abdomen opaque, densely, closely punctate.

*Types*.—Lectotype, ♂: American Entomological Society, no. 2096. Allotype, ♀: American Entomological Society.

UTAH: Logan Cañon, July 24, 1906, 1 ♂ (Dr. P. B. Homer), [Cornell University].

NEVADA: 3 ♂, 6 ♀ [American Entomological Society].

CALIFORNIA: Felton, Santa Cruz Mts., May 20–25, 1907, 2 ♂, 3 ♀, between 300 and 500 feet elevation (J. C. Bradley), [Cornell University]; Claremont, 1 ♂, 3 ♀ (C. F. Baker), [Pomona College and Cornell University]; 3 ♂, 3 ♀ [including types, American Entomological Society]; Fallen Leaf Lake near Lake Tahoe, 2 ♂, 2 ♀, June 29 and July 11 and 12, 1915 (E. C. Van Dyke), [California Academy of Sciences and Cornell University]; Carrville, Trinity Co., 2 ♀, June 6, 29, 1903 (E. C. Van Dyke), [California Academy of Sciences].

WASHINGTON: Cheney, June 30, 1908, and May, 1906, 2 ♀ [Cornell University].

A number of specimens of this species were taken by the author on different days within a very short area along an abandoned, overgrown road leading south from the residence of Mr. Trotz at Felton, California. They were flying leisurely over grass, close to the ground.



**Trimeria** Saussure

Figures 23, 38, 39, 53-55, 84, 105

1912. *Trimeria* Zavattari. Archiv für Naturgeschichte, vol. 78, pt. A, no. 2, p. 58. Redescription.

♂. Head transversely quadrate; the temples narrow, margined posteriorly, rectangular below; eyes triangularly emarginate, the apex of the incision slightly obtuse, distant from one another above; the ocelli in an equilateral triangle; vertex prominent; front nearly flat, without tubercles; clypeus slightly convex, shield-shaped, its anterior margin broadly shallowly emarginate; mandibles broad, obliquely tridentate toward the apex; ligula elongate and retractile; labial palpus completely 3-segmented; maxillary palpus reduced to a transparent, very short, conical tubercle. Antenna much shorter than the thorax, of 12 distinct segments, not clavate but the flagellum slightly fusiform; scape long, cylindrical, pedicel less than one-third as long, remaining segments short, as broad or broader than long, the seventh to the tenth dilated a little mesally beneath.

Dorsal surface of pronotum anteriorly transversely margined; parapsidal furrows wanting; tegula small, oval, not covering the base of the scutellum, the outer margin not sinuate, or scarcely so; scutellum rather flat, in some species posteriorly margined with a reflexed rim overhanging the postscutellum; posterior surface of propodeum sloping, the angles mucronate.

Forewing not plaited,  $R_5$  absent, the cells  $R_4$  and  $R_5$  therefore coalesced; m-cu attached to  $Cu_1$ , which from that point turns downward to meet  $M_4$ . Anterior trochanter armed at apex with a process with two upturned lamellate edges; anterior femur with its posterior inferior edge somewhat angled and sinuate; middle femur flattened beneath; tibiae with regular surfaces; anterior tibial spur strongly curved, slender, acute; middle tibia with a single apical spur; larger posterior tibial spur bifid at apex; tarsal claws simple.

Abdomen sessile, the basal dorsal segment squarely truncate at base, the apical segment short, hoodlike, strongly decurved toward and weakly notched at the apex; second and third ventral segments unarmed; last ventral segment with its apical border truncate.

Squama ending in an upturned acute hook, a tubercle on the inner side apicad of the sagitta, which is reduced to a larger tubercle borne on the inner side of the squama; uncus very broad and flat, obtuse, beneath with two long sharp barbs at base.

I have not seen a female.

*Type*.—*Trimeria americana* Saussure, genus monobasic.

*Habitat*.—Brazil and Argentina.

## LIST OF SPECIES

*americana* Saussure, ♀. Brazil.

1853. *Erynnis americana* Saussure. ♀. Bull. Société Entomologique de France, (3) I, p. xx, n. 2.  
(3) I, p. xx, n. 2.

*buyssoni* Brethes, ♂, ♀. Argentine, Paraguay.

1904. *Trimeria buyssoni* Brethes, ♀. Anales del Museo nacional de Buenos Aires, (3), vol. 2, p. 371.  
1905. *Trimeria buyssoni* Du Buysson, ♂. Bulletin de la Société Entomologique de France, 1905, p. 10.  
1912. *Trimeria buyssoni* Zavattari, ♂, ♀. Archiv für Naturgeschichte, vol. 78, pt. A, no. 2, p. 59.

*howardi* Bertoni. Argentina.

1912. *Trimeria howardi* Bertoni. Anales del Museo nacional de Buenos Aires, (3), vol. 22, p. 104.

*joergenseni* Schrottky, ♂, ♀. Argentina.

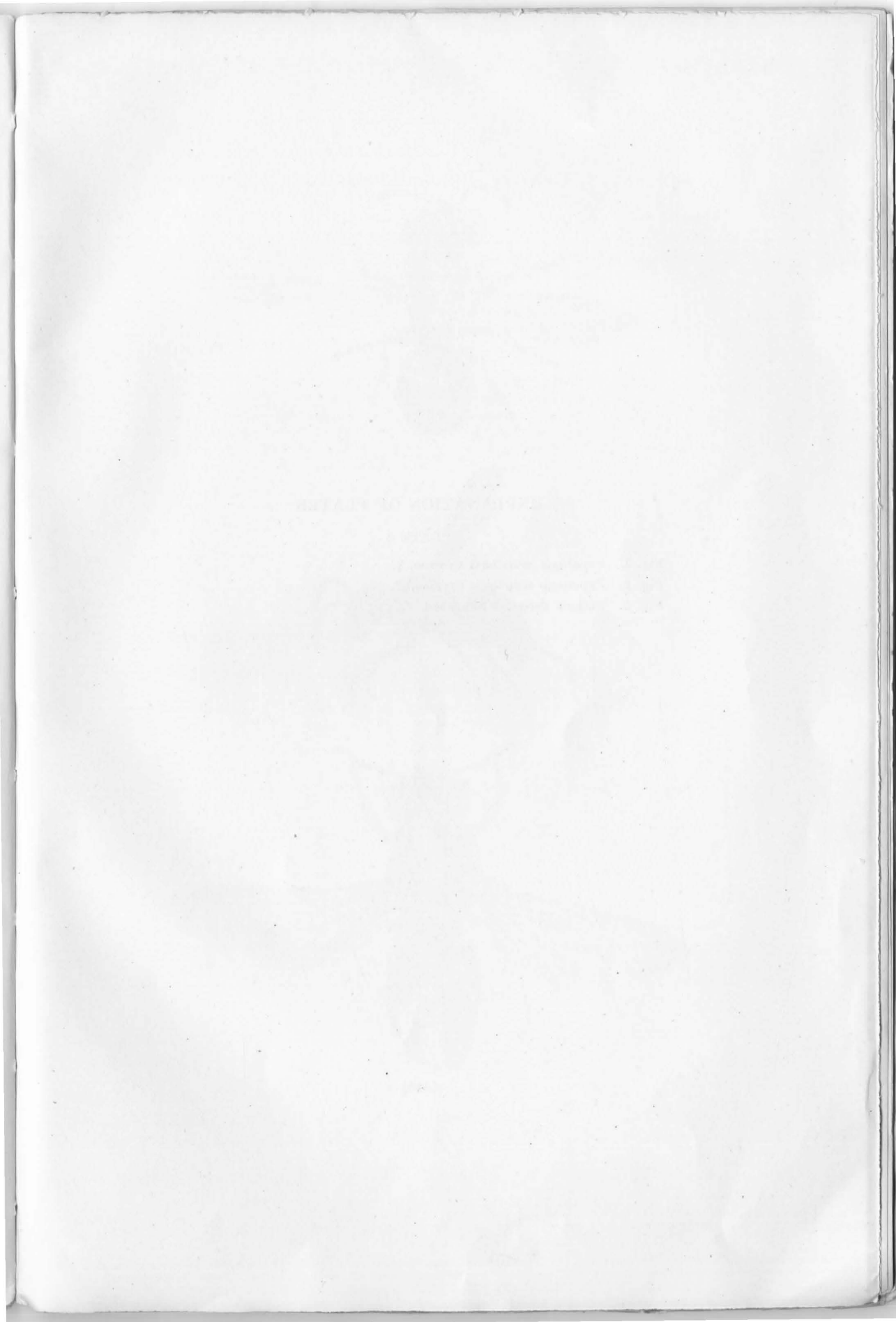
1909. *Trimeria joergenseni* Schrottky, ♀. Revista del Museo del la Plata, vol. 16, p. 137.  
1910. *Trimeria joergenseni* Brethes, ♂. Anales del Museo nacional de Buenos Aires, vol. 20, p. 285.  
1912. *Trimeria joergenseni* Zavattari, ♂, ♀. Archiv für Naturgeschichte, vol. 78, pt. A, no. 2, p. 59.

*neotropica* (Mocsarya) Du Buysson, ♂, ♀.

1906. *Jugurtia neotropico* Mocsarya, ♂. Annales Historico-Naturales Musei Nationalis Hungarici, vol. 4, p. 197.  
1910. *Trimeria neotropica* Du Buysson, ♂. Zoologische Jahrbücher, Abt. für Syst., vol. 49, p. 241.  
1912. *Trimeria neotropica* Zavattari, ♂, ♀. Archiv. für Naturgeschichte, vol. 78, pt. A, no. 2, p. 60.

## KEY TO THE SPECIES

Zavattari, Edoardo. Archiv für Naturgeschichte, 1912, pt. A, no. 2, p. 59.



## EXPLANATION OF PLATES

### PLATE 2

- Fig. 1. *Euparagia scutellaris* Cresson, ♀.  
Fig. 2. *Euparagia scutellaris* Cresson, ♂.  
Fig. 3. *Paragia decipiens* Shuckard, ♂.



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PLATE 3

- Fig. 4. *Gayella eumenoides* Spinola, ♂.  
Fig. 5. *Masariella alfkeni* (Du Buysson), ♂.  
Fig. 6. *Pseudomasaris coquilletti* (Rohwer), ♂.  
Fig. 7. *Celonites abbreviatus* (Villers), ♂.  
Fig. 8. *Paraceramius lusitanicus* (Klug), ♂.  
Fig. 9. *Ceramius fonscolombei* Latreille, ♂.



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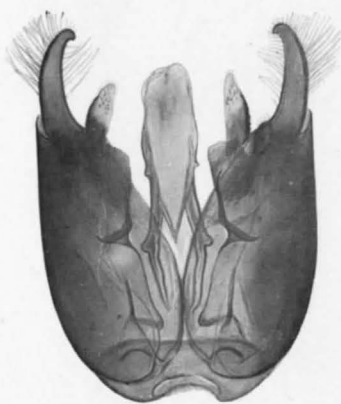
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PLATE 4

- Fig. 10. *Pseudomasaris edwardsii* (Cresson). Genitalia.  
Fig. 11. *Euparagia scutellaris* Cresson. Genitalia.  
Fig. 12. *Ceramius fonscolombei* Latreille. Genitalia.  
Fig. 13. *Paragia tricolor* Smith. Trophi, ♀.  
Fig. 14. *Euparagia scutellaris* Cresson. Trophi.  
Fig. 15. *Ceramius fonscolombei* Latreille. Trophi.



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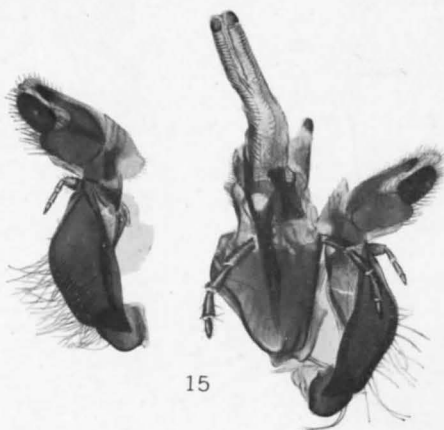
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PLATE 5

- Fig. 16. *Paraceramius lusitanicus* (Klug). Trophi.  
Fig. 17. *Paraceramius lusitanicus* (Klug). Central portion of tongue, much enlarged.  
Fig. 18. *Masaris vespiformis* Fabricius. Trophi.

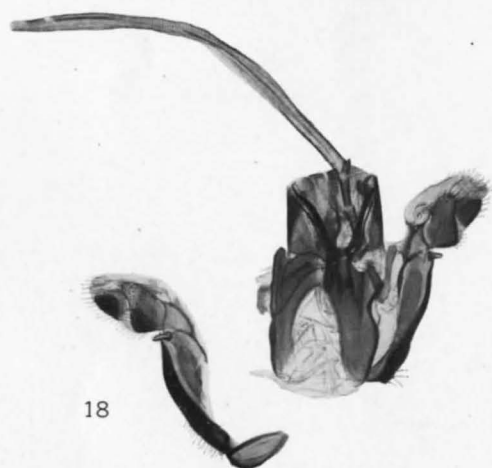




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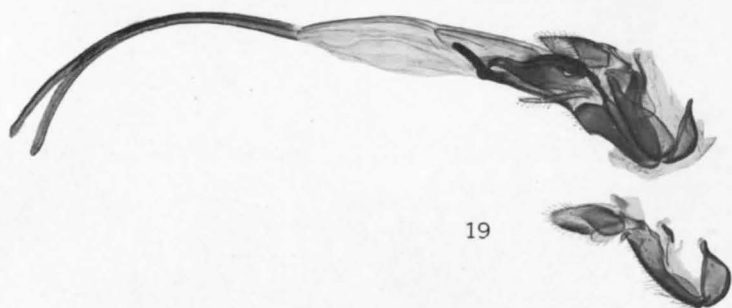
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PLATE 6

- Fig. 19. *Pseudomasaris occidentalis* (Cresson). Trophi.  
Fig. 20. *Pseudomasaris marginalis* (Cresson). Trophi, the tongue retracted.  
Fig. 21. *Pseudomasaris vespoides* (Cresson). Trophi.



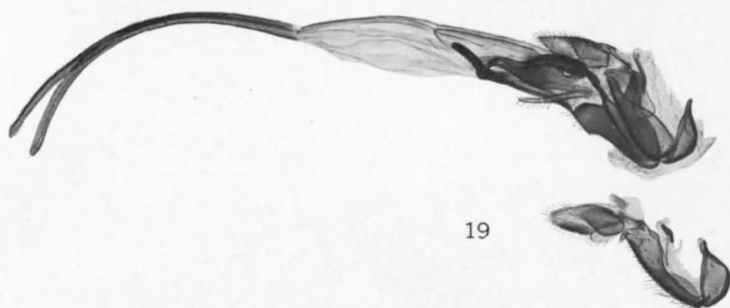
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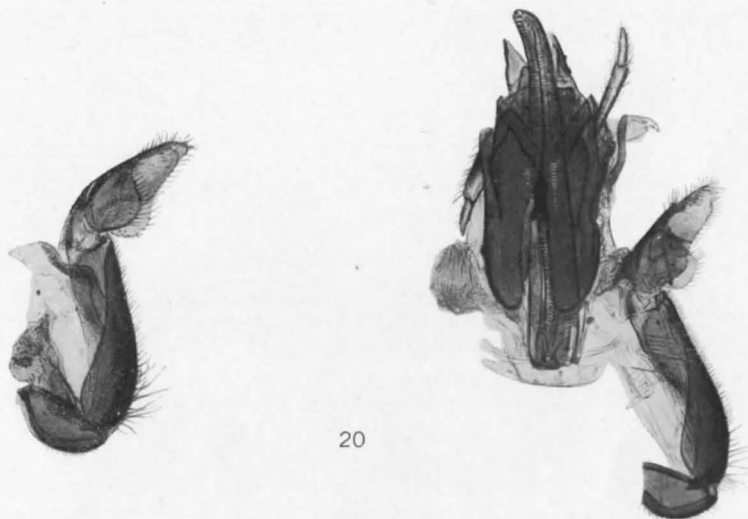
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PLATE 7

Fig. 22. *Celonites abbreviatus* (Villers). Trophi.

Fig. 23. *Trimeria buyssoni* Brethes. Trophi.



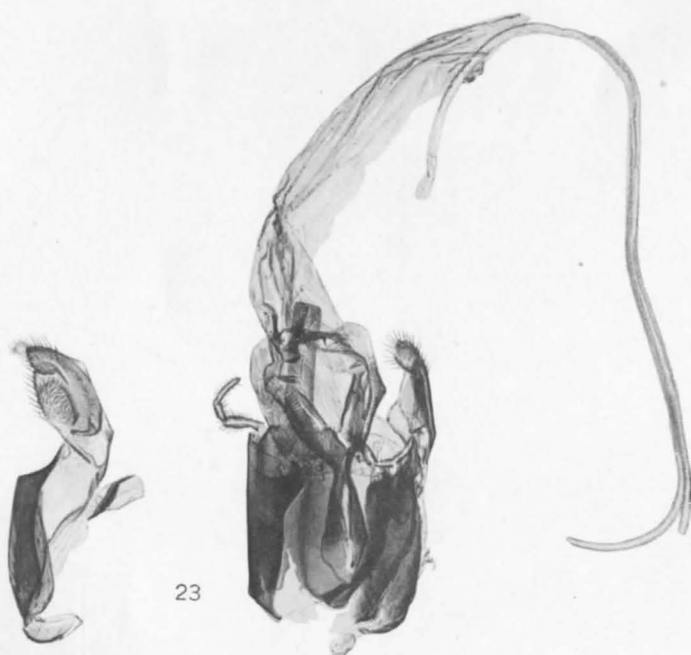


PLATE 8

- Fig. 24. *Paragia decipiens* Shuckard. Right tegula.
- Fig. 25. *Paragia decipiens* Shuckard. Right lateral view of scutellum and postscutellum.
- Fig. 26. *Euparagia scutellaris* Cresson. Right lateral view of scutellum and postscutellum.
- Fig. 27. *Euparagia scutellaris* Cresson. Right tegula.
- Fig. 28. *Masaris vespiformis* Fabricius. Lateral view of right side of posterior part of thorax and first abdominal segment.
- Fig. 29. *Masaris vespiformis* Fabricius. Dorsal view of right side of posterior part of thorax and first abdominal segment.
- Fig. 30. *Masaris vespiformis* Fabricius. Left tegula.
- Fig. 31. *Pseudomasaris edwardsii* (Cresson). Right lateral view of scutellum and postscutellum.
- Fig. 32. *Pseudomasaris edwardsii* (Cresson). Dorsal view of scutellum and postscutellum.
- Fig. 33. *Pseudomasaris edwardsi* (Cresson). Right tegula.
- Fig. 34. *Celonites abbreviatus* (Villers). Right lateral view of thorax and basal segment of abdomen.
- Fig. 35. *Celonites abbreviatus* (Villers). Dorsal view of thorax and basal segment of abdomen.
- Fig. 36. *Ceramioides capicola* (Brauns). Right lateral view of scutellum and postscutellum.
- Fig. 37. *Paraceramius lusitanicus* (Klug). Left tegula.
- Fig. 38. *Trimeria buyssoni* Brethes. Right lateral view of scutellum and postscutellum.
- Fig. 39. *Trimeria buyssoni* Brethes. Right tegula.
- Fig. 40. *Masariella alfkeni* (Du Buysson). Left lateral view of posterior part of thorax and first abdominal segment.
- Fig. 41. *Masariella alfkeni* (Du Buysson). Left tegula.

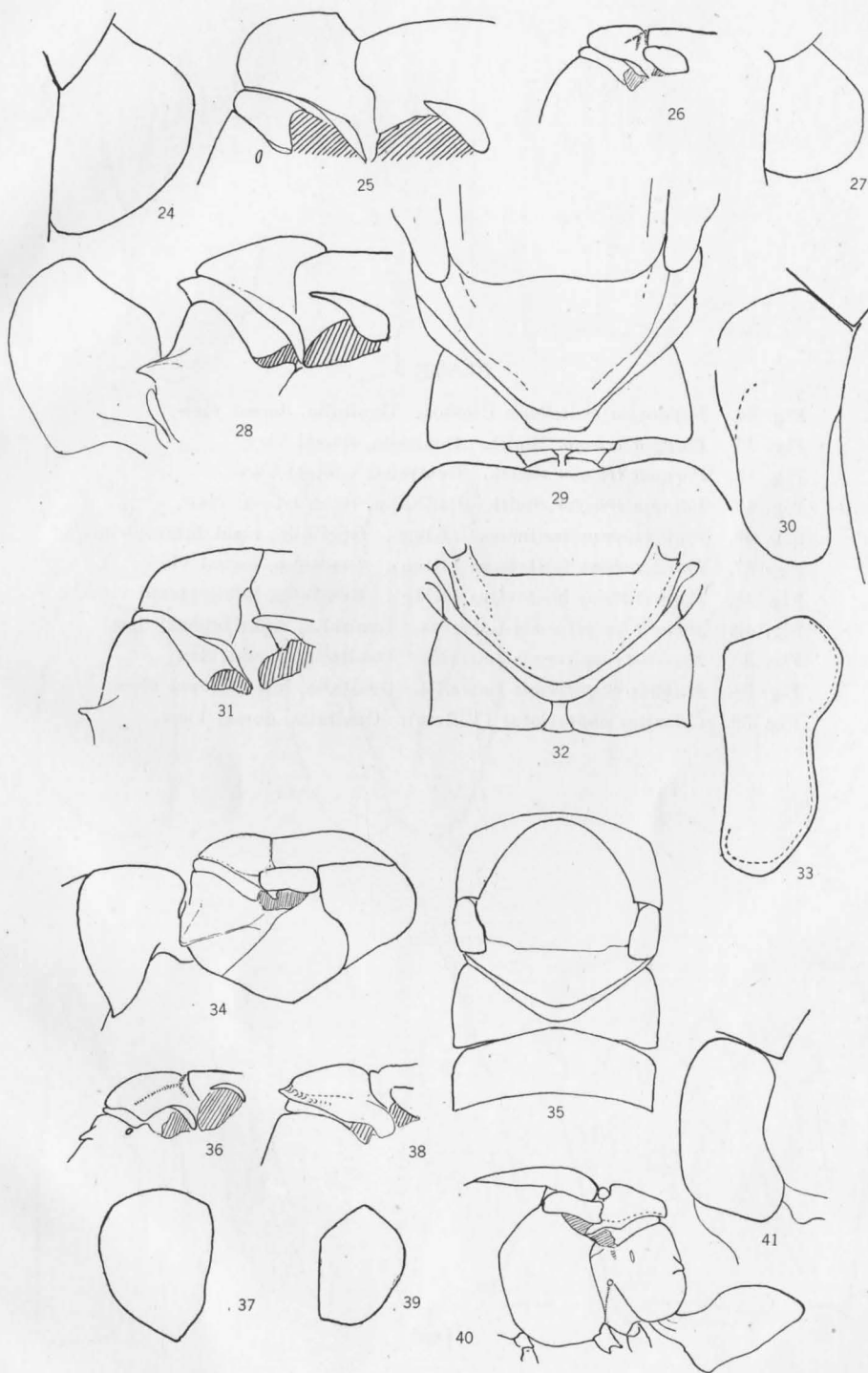


PLATE 9

- Fig. 42. *Euparagia scutellaris* Cresson. Genitalia, dorsal view.  
Fig. 43. *Paragia tricolor* Smith. Genitalia, dorsal view.  
Fig. 44. *Paragia tricolor* Smith. Genitalia, ventral view.  
Fig. 45. *Paragia tricolor* Smith. Genitalia, right lateral view.  
Fig. 46. *Paraceramius lusitanicus* (Klug). Genitalia, right lateral view.  
Fig. 47. *Paraceramius lusitanicus* (Klug). Genitalia, dorsal view.  
Fig. 48. *Paraceramius lusitanicus* (Klug). Genitalia, left internal view.  
Fig. 49. *Masaris vespiformis* Latreille. Genitalia, right lateral view.  
Fig. 50. *Masaris vespiformis* Latreille. Genitalia, dorsal view.  
Fig. 51. *Masaris vespiformis* Latreille. Genitalia, left internal view.  
Fig. 52. *Celonites abbreviatus* (Villers). Genitalia, dorsal view.

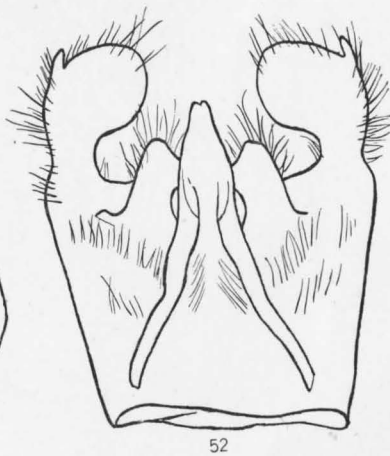
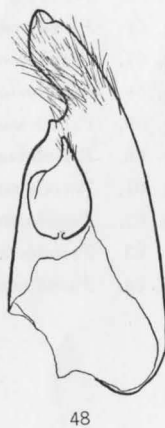
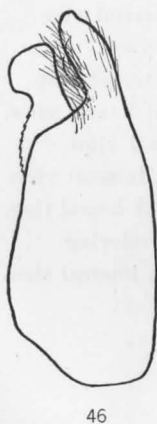
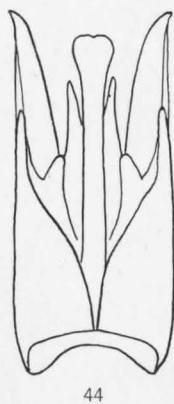
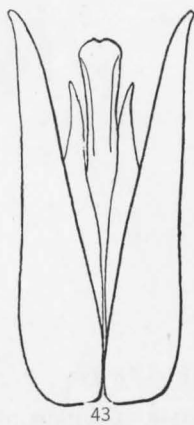
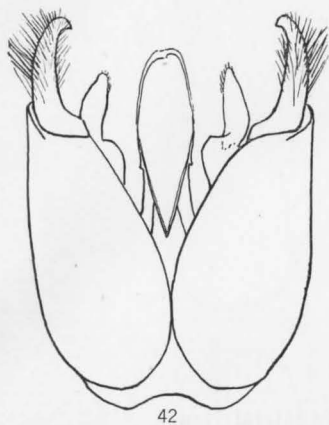


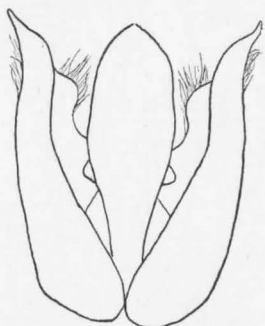


PLATE 10

- Fig. 53. *Trimeria buyssoni* Brethes. Genitalia, right lateral view.  
Fig. 54. *Trimeria buyssoni* Brethes. Genitalia, dorsal view.  
Fig. 55. *Trimeria buyssoni* Brethes. Genitalia, left internal view.  
Fig. 56. *Pseudomasaris texanus* (Cresson). Genitalia, right lateral view.  
Fig. 57. *Pseudomasaris texanus* (Cresson). Genitalia, dorsal view.  
Fig. 58. *Pseudomasaris texanus* (Cresson). Genitalia, left internal view.  
Fig. 59. *Pseudomasaris marginalis* (Cresson). Genitalia, right lateral view.  
Fig. 60. *Pseudomasaris marginalis* (Cresson). Genitalia, dorsal view.  
Fig. 61. *Pseudomasaris marginalis* (Cresson). Genitalia, left internal view.  
Fig. 62. *Pseudomasaris occidentalis* (Cresson). Genitalia, right lateral view.  
Fig. 63. *Pseudomasaris occidentalis* (Cresson). Genitalia, dorsal view.  
Fig. 64. *Pseudomasaris occidentalis* (Cresson). Genitalia, left internal view.



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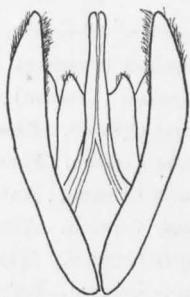
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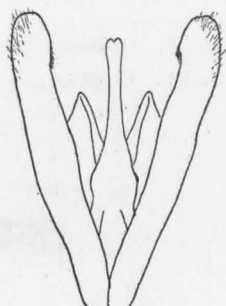
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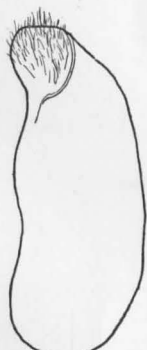
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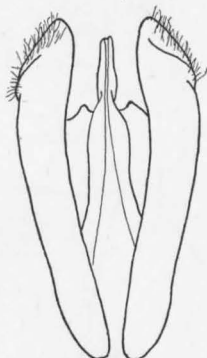
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PLATE 11

- Fig. 65. *Pseudomasaris vespoides* (Cresson). Genitalia, right lateral view.  
Fig. 66. *Pseudomasaris vespoides* (Cresson). Genitalia, dorsal view.  
Fig. 67. *Pseudomasaris vespoides* (Cresson). Genitalia, Left internal view.  
Fig. 68. *Euparagia scutellaris* Cresson. Face, ♀.  
Fig. 69. *Euparagia scutellaris* Cresson. Face, ♂.  
Fig. 70. *Euparagia scutellaris* Cresson. Antenna, ♂.  
Fig. 71. *Euparagia scutellaris* Cresson. Antenna, ♀.  
Fig. 72. *Euparagia scutellaris* Cresson. Maxilla.  
Fig. 73. *Euparagia scutellaris* Cresson. Labium.  
Fig. 74. *Euparagia scutellaris* Cresson. Posterior aspect of right anterior trochanter.  
Fig. 75. *Paragia tricolor* Smith. Ultimate dorsal segment.  
Fig. 76. *Paragia tricolor* Smith. Clypeus.

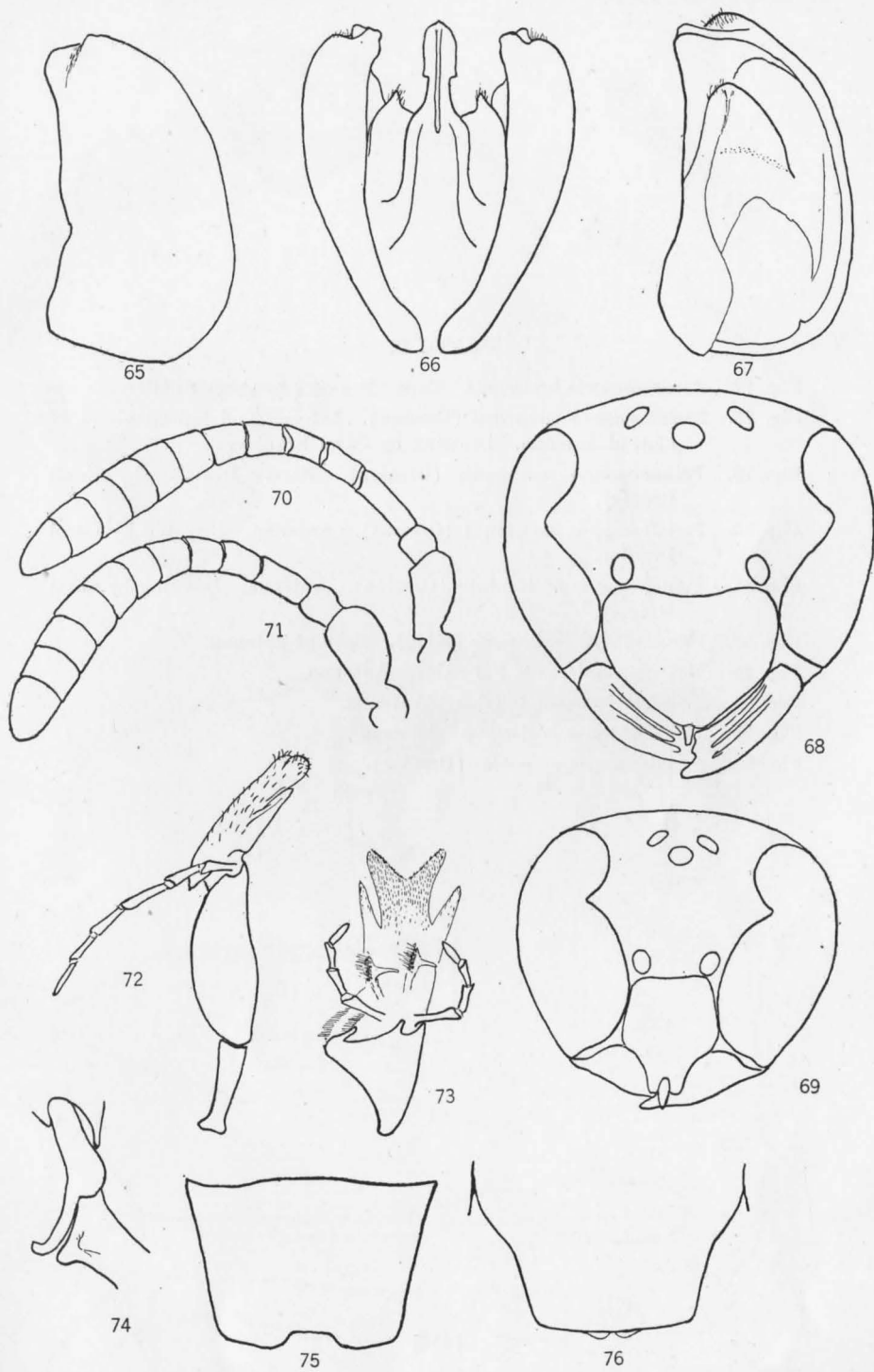


PLATE 12

- Fig. 77. *Pseudomasaris bariscipus*. Face. Drawing by Carol Bradley.
- Fig. 78. *Pseudomasaris edwardsii* (Cresson). Inferior and lateral views of club of antenna. Drawing by Carol Bradley.
- Fig. 79. *Pseudomasaris marginalis* (Cresson). Face. Drawing by Carol Bradley.
- Fig. 80. *Pseudomasaris marginalis* (Cresson). Antenna. Drawing by Carol Bradley.
- Fig. 81. *Pseudomasaris occidentalis* (Cresson). Antenna. Drawing by Carol Bradley.
- Fig. 82. *Paraceramius lusitanicus* (Klug). Base of antenna.
- Fig. 83. *Masaris vespiformis* Fabricius. Antenna.
- Fig. 84. *Trimeria buyssoni* Brethes. Antenna.
- Fig. 85. *Pseudomasaris bariscipus*. Antenna.
- Fig. 86. *Pseudomasaris vespoides* (Cresson).



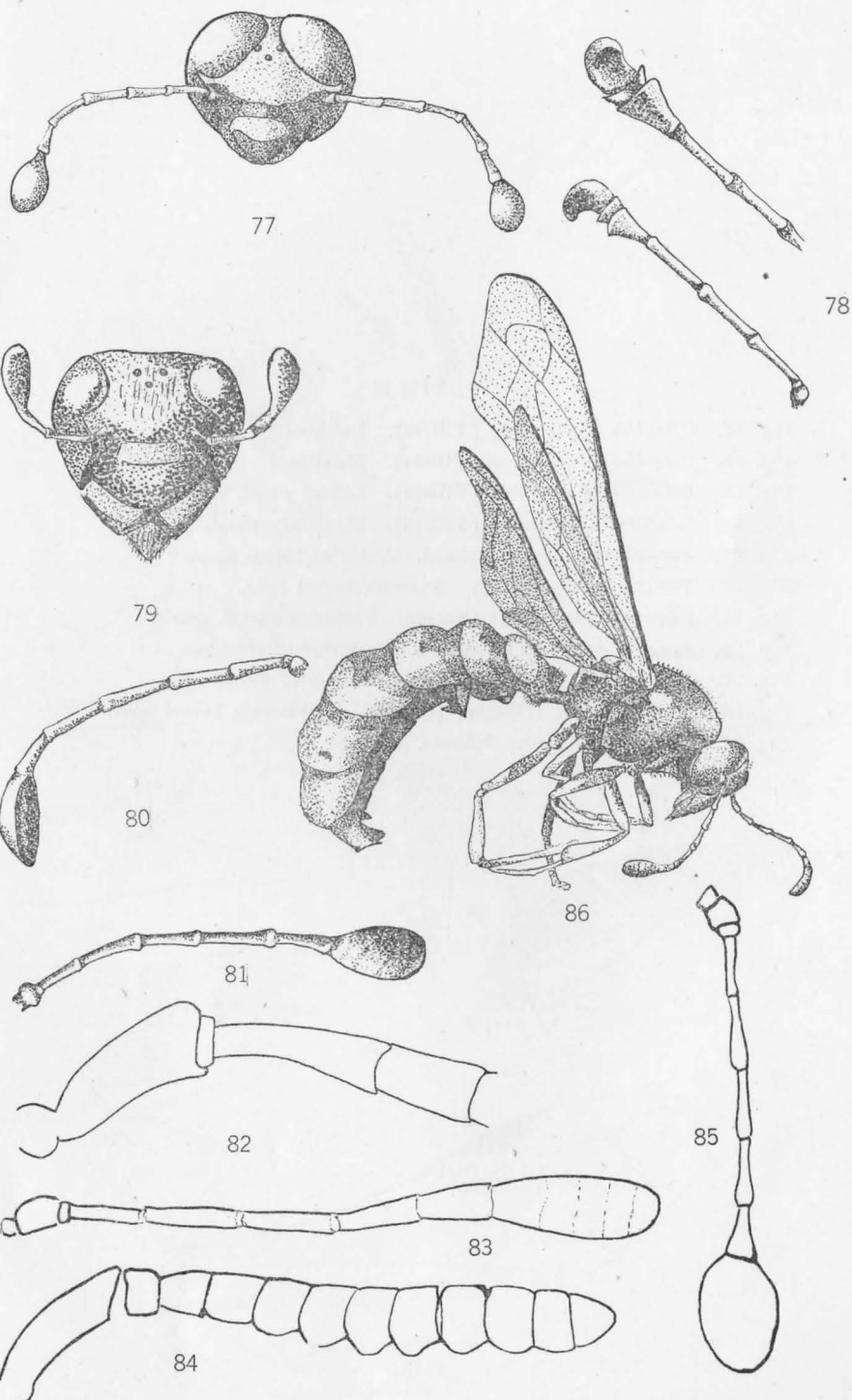


PLATE 13

- Fig. 87. *Celonites abbreviatus* (Villers). Labium.  
Fig. 88. *Celonites abbreviatus* (Villers). Maxilla.  
Fig. 89. *Celonites abbreviatus* (Villers). Labial palpi, ♀.  
Fig. 90. *Celonites abbreviatus* (Villers). Maxillary palpi, ♀.  
Fig. 91. *Paragia decipiens* Shuckard. Anterior tarsal spur.  
Fig. 92. *Paragia tricolor* Smith. Anterior tarsal spur.  
Fig. 93. *Euparagia scutellaris* Cresson. Posterior tarsal spur.  
Fig. 94. *Paragia decipiens* Shuckard. Posterior tarsal spur.  
Fig. 95. *Masaris vespiformis* Fabricius. Posterior tarsal spur.  
Fig. 96. *Pseudomasaris vespoides* (Cresson). Posterior tarsal spur.  
Fig. 97. *Gayella eumenoides* Spinola. Wings.

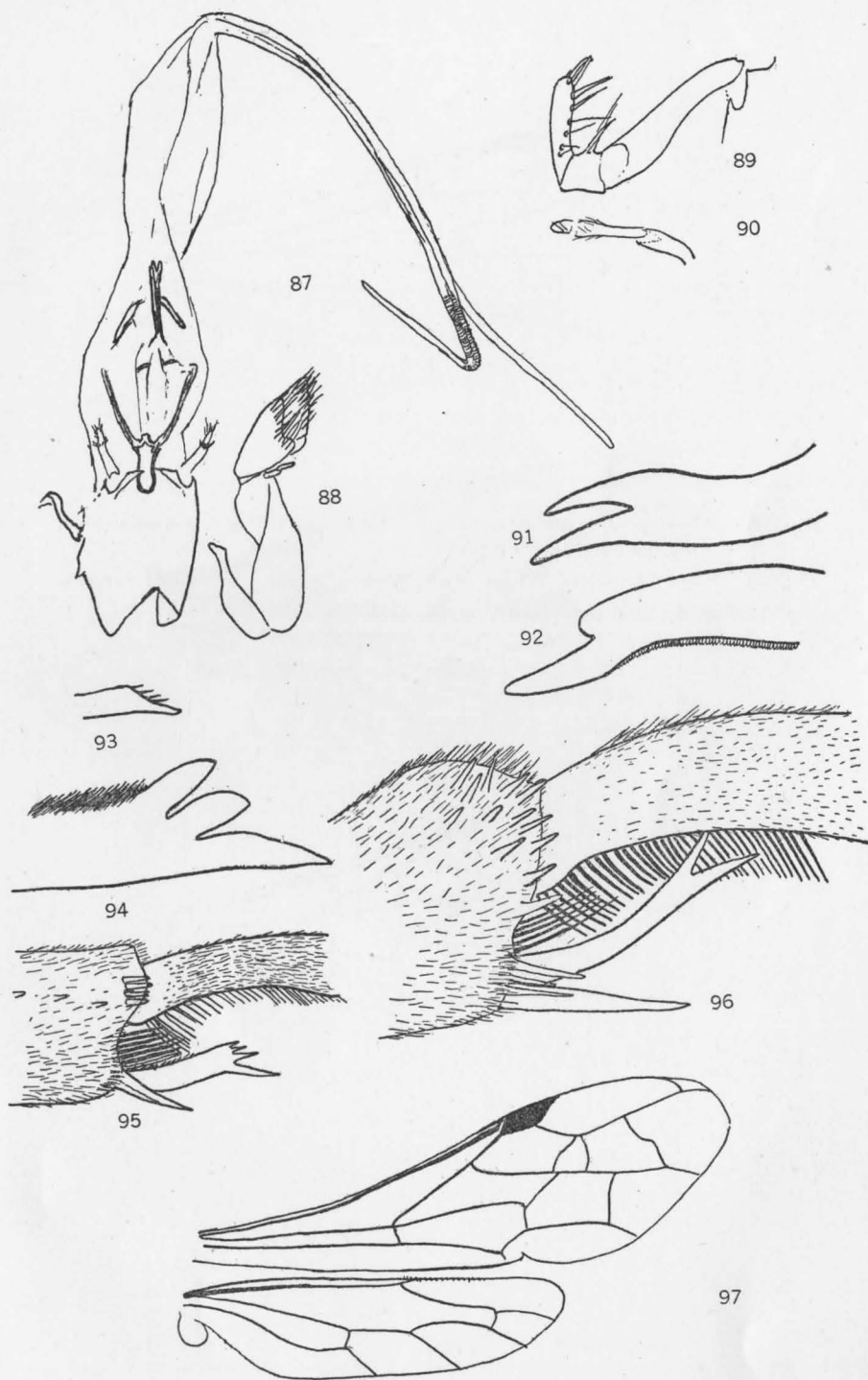
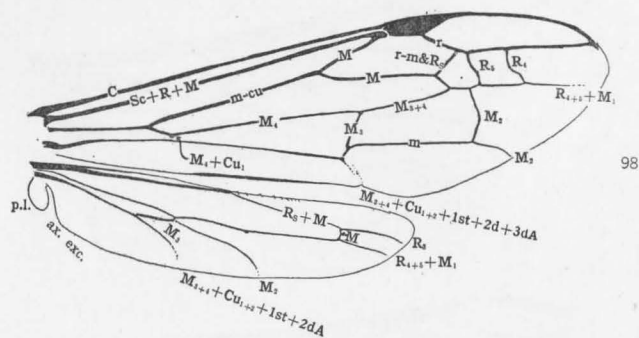
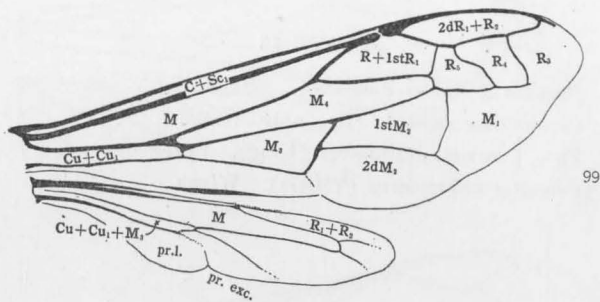


PLATE 14

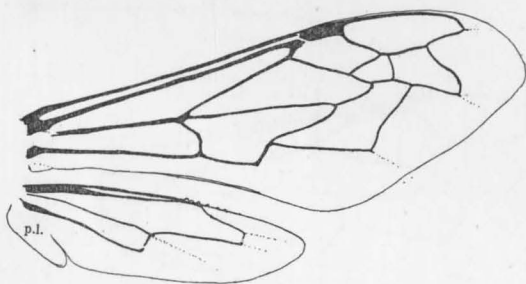
- Fig. 98. *Mischocyttarus labiatus*. Wings. Veins labeled: *p. l.*, posterior lobe;  
*ax. exc.*, axillary excision.
- Fig. 99. *Vespa diabolica*. Wings. Cells labeled: *pr. exc.*, preaxillary excision.
- Fig. 100. *Euparagia scutellaris* Cresson. *p. l.*, posterior lobe.



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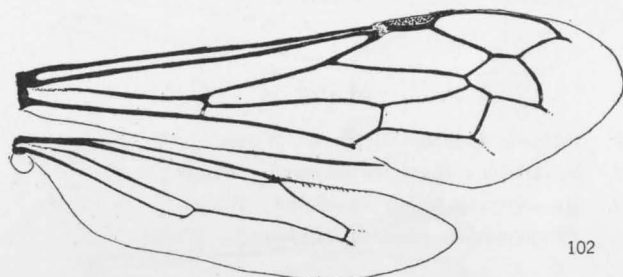


PLATE 15

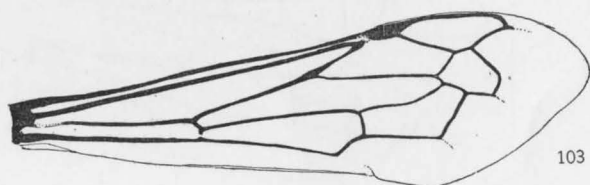
- Fig. 101. *Paragia decipiens* Shuckard. Wings.  
Fig. 102. *Ceramioides capicola* (Brauns). Wings.  
Fig. 103. *Para Ceramius lusitanicus* (Klug). Forewing.  
Fig. 104. *Celonites abbreviatus* (Villers). Wings.



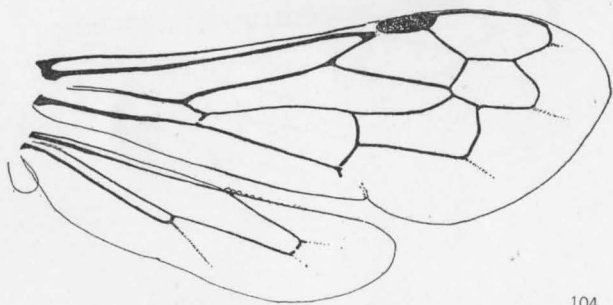
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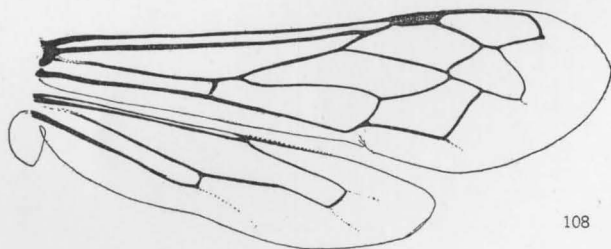
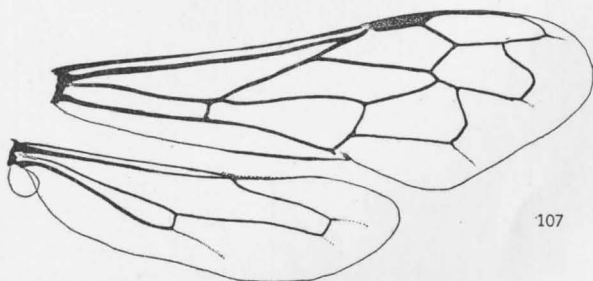
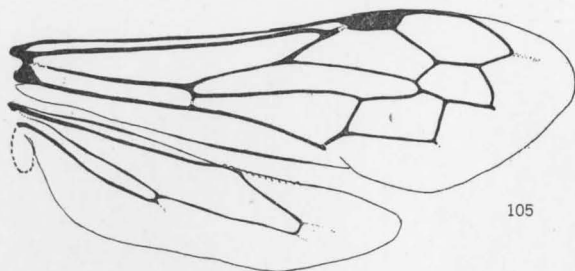
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PLATE 16

- Fig. 105. *Trimeria buyssoni* Brethes. Wings.  
Fig. 106. *Masariella alfeni* Du Buysson. Wings.  
Fig. 107. *Masaris vespiformis* Fabricius. Wings.  
Fig. 108. *Pseudomasaris edwardsi* (Cresson). Wings.



[not p. 465!]

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Index, pp. 589-595.	
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