Revision of the species of Psenini in America north of Mexico (Hymenoptera: Schecidae)
by Arthur Richard Gittins

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of DOctor of philosophy in Entomology
Montana State University

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Keys to the various taxa are included along with distribution data and available information on the biologies of each species. A historical review of systematic and nomenclatorial studies on the tribe precedes the present systematic treatment of this group, as do sections dealing with psenine external anatomy and phylogeny.

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ABSTRACT

The results of a systematic study on the species of Pemphredoninae within the tribe Psenini which occur in America north of Mexico are presented. In addition to seven new species described, included are re-descriptions of all valid species within the genera Diodontus, Ammopsen, Mimumesa and Mimesa, diagnoses of the genera Psen, Pseneo and Pluto, and an annotated list of the species of the latter three genera. Keys to the various taxa are included along with distribution data and available information on the biologies of each species. A historical review of systematic and nomenclatorial studies on the tribe precedes the present systematic treatment of this group, as do sections dealing with psenine external anatomy and phylogeny.

INTRODUCTION

This thesis presents the results of studies, largely systematic, on the species of the wasp tribe Psenini present in North America, north of Mexico.

This work was undertaken with the express purpose of establishing the relationships of species and higher categories within this large but poorly known sphecoid tribe belonging to the subfamily Pemphredoninae. The study also was carried out so as to provide a means of identification of the North American forms. It is the earnest hope that presentation of this research may act as a stimulus to further studies on classification and biology of these wasps.

In this revision, seven genera are considered, including a monotypic genus Ammopsen recently described by Krombein (1959) and not previously included in systematic papers dealing with the tribe. A total of 58 species are considered herein, seven of which are new.

HISTORICAL REVIEW

First mention of a species pertaining to the group now under discussion was that of Sphex atra, the female of which was described by Fabricius in 1794 in "Entomologica Systematica." Following this, Latreille (1796) erected the genus Psen in "Precis Characteres Genera Insecta," giving a brief description of the genus but assigning no species to it.

In 1798, Panzer, in his famous paper "Fauna Insecta Germanica," described a second species of this group, naming it Sphex pallipes. This species, which appears to have been misidentified by earlier workers, is the generotype of Diodontus Curtis (=Psenulus Kohl of European authors). Then in 1801, Panzer published a list of wasp genera that Jurine enlarged upon later. In this second publication, "Intelligenzblath der Literatur-Zeitung," Panzer accepted Latreille's genus Psen and designated Sphex atra Fabricius as the generotype.

Fabricius, in 1804, in "Systema Piezatorum," described a number of psenines but assigned them to genera other than Psen. Four European species which Fabricius described at that time were Pelopeus compressicornis, P. unicolor, Trypoxylon atratum and T. equestre, all of which were later transferred to the genus Psen. It is interesting to note that Pelopeus compressicornis later proved to be the male of Sphex atra and P. unicolor a variant female of the same species. In his paper, Fabricius also described Pepsis lutaria which may be conspecific with the currently recognized Mimesa bicolor Shuckard. However, because of the vague description which accompanied publication of the Fabrician name, European workers have been forced to relegate Pepsis lutaria to the status of a nomen dubium.

The fine discriminating eye of Panzer was again evident

through a "Kritische Revision" published in 1806. While he assigned no additional generic names to the material known to him, he recognized three groups within the genus Psen. He noted that the first group was typified by Psen atra (Fabricius), the second by P. pallipes (Panzer), and the third by P. equestris (Fabricius). Each of these species is now assigned to different genera of the Psenini and are presently named Psen atra (Fabricius), Diodontus pallipes (Panzer), and Mimesa equestris (Fabricius) respectively. Additionally, Panzer did much toward clarifying the classification of the Psenini by placing in synonymy a number of species names, among which were those of Fabricius previously mentioned.

One year later, in 1807, Jurine published his famous "Nouvelle Methods de Classer l'Hymenoptera," relying in great part upon the wing venation for his classification. In this paper, Jurine defined with precision the genus Psen and considered this taxon as composed of two distinct groups or "families." In the first group he placed P. atra (Fabricius) and in the second group P. equestris (Fabricius). Van der Linden, in 1829, agreed with Jurine's division of the Psen into two groups and described P. unicolor as another member of the second group or "family."

Curtis (1834) erected the genus Diodontus for specimens he believed to be P. pallipes (Panzer). Curtis thought, as Panzer had indicated in 1806, that this species was not

congeneric with either P. atra or P. equestris. Most European workers, however, believe Curtis misidentified material and they have not recognized or accepted Diodontus in spite of nomenclatorial rules to the contrary. Three years after the Curtis publication, Shuckard, in his "Essay on Indigenous Fossorial Hymenoptera," proposed the name Mimesa for Jurine's and Van der Linden's second group, with the type being Mimesa equestris (Fabricius). Additionally, he added the species bicolor Jurine to this taxon. Also in 1837 the first two North American species were described by Say who assigned both to the genus Psen. These were leucopus and mellipes, redescribed by Fox in 1898 and now both assigned to the genus Mimumesa.

The next work of note was that of Dahlbom who, in 1843, recognized both Psen and Mimesa in his publication, "Hymenoptera Europaea." Of note here is his admitted recognition of two divisions within the genus Mimesa. Although he indicated that a decided gap was evident between two groups of species, he assigned no names to these groupings but simply stated ... "Chez les representats de la premiere, unicolor et borealis, le front presente une carene entre les antennes, tandis que chez ceux de la deuxieme, atra, lutaria, et equestris il est arme d'un tubercule." It is interesting to note that Dahlbom assigned the Psen generotype atra to the genus Mimesa on the basis of wing venation, and placed Psen atratus (Fabricius)

(=pallipes Panzer) in Psen as the generotype. In 1849, Wissman apparently recognized the difficulty arising from Dahlbom's handling of atra (Fabricius) and created the genus Dahlbomia for this species, a name later assigned to synonymy with Psen.

In 1852, Wesmael published on the psenine species of central Europe, calling attention to some synonymy he considered evident. He concurred with Panzer's and Dahlbom's recognition of Psen and Mimesa as the generic representatives of the Psenidae, but he erred in following Dahlbom and assigned atratus (Fabricius) and concolor Dahlbom to Psen and misplaced atra (Fabricius) in Mimesa. He also felt, as Dahlbom had indicated, that Mimesa contained more than one distinct group of species, but differed in considering that there were three groups rather than two within that genus. To each of these groups within Mimesa he assigned the following subgeneric names: Mesopora -- to contain the generotype of Psen, P. atra; Mimesa -- to contain a group including M. unicolor; and Aporia -- to contain the group including the generotype M. equestris. While this created some nomenclatorial difficulties, Wesmael contributed much to the taxonomy of the group in recognizing that subgeneric levels did exist through discontinuity between species groups within the genus Mimesa.

In 1856, Smith described the third North American species from a male specimen collected in the Hudson's Bay area of

Canada giving it the name Mimesa borealis. Pate, in 1944, recognized a case of primary homonymy between Smith's Mimesa borealis and Dahlbom's Mimesa borealis and renamed Smith's species M. psychrus. Cresson, in 1865, published descriptions of three new species apparently indigenous to the North American continent. He, like Smith before him, followed the generic concepts of Shukard and assigned his new species to the genus Mimesa. Packard (1867) was the first worker to attempt a comprehensive treatment of the species occurring in North America. He also followed the classification of Shuckard and assigned all previously described species of Say, Smith and Cresson, along with seven new species, to Psen and Mimesa.

The next major revision of North American forms was published by Fox in 1898. While describing a number of new species and establishing some new synonymy he supported the older contention that the tribe was composed of a series of species belonging only to a single genus Psen. It is interesting to note, however, that several years previously Fox (1893) had named a new species Mimesa maculipes. By this time, however, European workers had come to agree that both Psen and Mimesa constituted valid genera.

Following Fox's paper a number of North American workers published short notes on psenine wasps. Largely, these papers dealt with descriptions, often incomplete, of new species.

While most of these persons recognized Mimesa as a separate genus, a few, such as Rohwer and Cameron, considered Mimesa as a subgenus of Psen. During this period one American worker, Viereck (1901), supported the opinion of Shuckard but also recognized Psenulus Kohl as a distinct genus. Kohl (1896), in a paper dealing with European psenines, stated that he was erecting the genus Psenulus for a group of species closely related to Psen fuscipennis Dahlbom, a species designated as the generotype of Psenulus by Ashmead three years later. On the untenuous basis of wing venation, later shown to be variable, Viereck decided, however, that the North American forms showed sufficient divergence from their palearctic Psenulus (=Diodontus) allies to deserve separate generic recognition. As Malloch later indicated, Viereck was unaware of the existence of the previously used name Diodontus Curtis and hence Viereck erroneously proposed the name Neofoxia for the American species of Diodontus (=Psenulus). At that time, Viereck recognized four genera in the group he referred to as the subfamily Pseninae: Psen Latreille, Mimesa Shuckard, Psenulus Kohl, and Neofoxia Viereck.

The next major work relating especially to changes in concepts with regard to higher taxa was a near-contemporary paper published by Malloch in 1933. This author, dealing exclusively with the North American forms, recognized three genera, Psen Latreille, Diodontus Curtis, and a new genus

Psenia Malloch peculiar to the new world fauna. Additionally, Malloch considered that there were four distinct groups of species within Psen that deserved subgeneric names. He treated the subgenera in the following manner: Psen (Psen) Latreille, with atra (Fabricius) as the type; Psen (Mimesa) Shuckard, with equestris (Fabricius) as the type; Psen (Pseneo) Malloch, with kohlii Fox as the type; Psen (Mimumesa) Malloch, with niger (Packard) as the type. In addition to the new concepts relating to higher taxa, Malloch's paper presented a summary of the species of our fauna and described a number of new species. M. deBeaumont (1937) stated Malloch's work is to be considered one of the really major contributions to Psenini taxonomy.

A historic sketch of works pertaining to the psenine wasps would be far from complete if two important, modern, European contributions were not mentioned. While neither contributes any new concepts relating to changes from Malloch's classification, other than recognizing Psenulus Kohl and discarding Diodontus Curtis, both add greatly to our knowledge of the biologies and taxonomy of the Palearctic species of this tribe of sphecoid wasps. This in itself leads to considerations of our own species in light of their evidences. In 1937 deBeaumont presented a revision of the palearctic species. His efforts are congruent with Malloch's and his paper is deserving of glory equal to that he affords the

American author. A British worker, Spooner, in 1948 published an outstanding paper on the British Isles species of psenine wasps. The greatest import of this paper lies with the voluminous data on the biologies of the British Isles species which substantiated the currently accepted classification of higher categories based entirely on structural attributes.

A further contemporary North American work, as it pertains to generic classification, was presented by Krombein in 1951. He considered the North American Psenini as composed of four genera, two of which were further divided into two subgenera. His groupings were as follows: Diodontus Curtis; Psen (Psen) Latreille, and Psen (Pseneo) Malloch; Mimesa (Mimesa) Shuckard, Mimesa (Mimumesa) Malloch; Pluto Pate. The last generic name had been proposed by Pate in 1937 as a new name for Malloch's genus Psenia which was found to be preoccupied. The most recent addition to psenine classification was again proposed by Krombein in 1959 when he employed the generic name of Ammopsen for a new form discovered in the southwestern United States.

PROCEDURE

The taxonomic portion of this study is based on an examination of approximately 5,000 specimens and all but five holotypes of the nearctic species under critical review. Species of Pluto, Psen and Pseneo are considered only in

annotated style for previous treatments (Malloch 1933; Krombein 1959) of those three taxa appear adequate and little new information on them is available.

Redescriptions of species have been standardized. Holotypes (and allotypes), paratypes or topotypes in descending order of availability were selected for redescription with statements on variation within the species incorporated into the redescription or appended in a diagnosis following descriptions of new species. Whenever possible both sexes were described.

Additionally, it was felt that in order to obtain parallel descriptions of genera which could be directly compared with one another, it was necessary to briefly redescribe all North American Psenini genera. This I have done with the genus Ammopsen, however, I have presented a more detailed description since this genus has not been included previously in any treatment of the tribe.

All measurements were made with the aid of a micrometer disc and all figures given are average values from a series unless otherwise indicated. Ratios expressed in descriptions are also based on micrometer measurements but are not meant to express definitive values.

Illustrations, used to supplement text discussion or keys, were prepared through use of an ocular grid. Only in the case of genitalial illustrations were drawings prepared to a

consistent scale. Before examining genitalia of most species and illustrating those of the Mimumesa species, reproductive structures were removed from specimens, cleared in creosote and mounted in Canada balsam.

Specific distributional information based on present and previous studies has been gathered and is included in the form of statements delimiting the range of each species under study. Additionally, type locality and type location are recorded for each species in which types are known to exist.

Regrettably, biological information on North American Psenini is at best fragmentary. Therefore, all available biological data for each species is recorded, having been obtained from ecological notes attached to preserved material or from literature records even while cognizant of the questionable determination of species referred to in earlier publications.

Finally I have included in species treatments two terminating sections entitled "Diagnosis" and "Discussion" -- the former concerned with statements relative to distinctive features of the taxon and variations I have found to exist within the species, and the latter dealing with synonymical and nomenclatorial considerations of the species and other taxonomic evaluations deemed pertinent.

BIOLOGY

As previously stated, there is only meager information available concerning the biologies of psenine wasps of North America. Sphecoid specialists still await publication of the first detailed biological study on an American species within the tribe. Not only is this gap in our knowledge regrettable for its own sake, but this void constitutes an unfortunate situation whereby biological characters are unavailable for use in the classification of North American Psenini. While admittedly selection of behavioral patterns toward reproductive isolation does not follow a predetermined mathematical time-model, in general relationships of behavioral patterns between taxa can materially contribute in interpreting or tracing phylogenetic relationships.

Spooner (1948), published the results of an excellent study on the British Isles species and presented valuable biological data which substantiates the presently recognized super-specific groupings based largely on structural characters. As Krombein (1951) states in reference to Spooner's work, "Thus, in Europe, Psen (Psen) uses larger Auchenorrhyncha (Cercopidae, Membracidae and Cicadellidae) and nests in ready-made cavities in wood or sandstone; Mimesa excavates burrows in the soil, and stores smaller Auchenorrhyncha (Cicadellidae), which are carried ventrally with the middle

legs; Mimumesa also uses smaller Auchenorrhyncha (Delphacidae, Cicadellidae), but carries the prey in the mandibles to nests in cavities in wood and stems; and Psenulus (recte Diodontus) preys on Sternorrhyncha (Aphidae, Psyllidae), which are carried ventrally by the middle legs to ready-made cavities in wood or plant stems." Fragmentary biological information on nearctic species indicate a similar correlation which is discussed in the body of the text under each appropriate taxon.

ANATOMICAL FEATURES

The anatomical nomenclature used in this paper is basically that previously employed by Malloch (1933), Krombein (1950) and others, but includes some terms newly introduced by the present writer.

Size and body form are of limited use since most nearctic species groups maintain a relatively constant appearance. Thus, while members of Ammopsen are much smaller than those of other genera, while Pluto spp. tend to be generally more elongate than most except for some Mimesa and Diodontus, and while Mimumesa and Psen are more robust, these characteristics are seldom clear-cut.

Head. Terminology employed for various areas of the head is included in the illustration (Fig. 1D). For the frontal region between the fronto-clypeal suture and the antennal

orbs, the term lower frons is used. The upper frons is designated as that area lying between the antennal orbs and the median ocellus and bounded laterally by the ocular sulci. The area contained by the ocellar triangle is termed the ocellar area. The "temple" a term used by some authors, is vague and has been discarded for the more appropriate "upper gena" -- an area bounded dorsally by the vertex, anteriorly by the ocular sulcus and posteriorly by the occipital carina. The portion of this same sclerite below the mid-lateral line is termed the lower gena. A careful examination of the punctation on these areas is essential since punctation frequently varies on these same areas between members of different species.

Facial ornamentation is a feature which has considerable value at the generic and specific levels of classification. The presence and gross appearance of a median longitudinal facial carina, which achieves its greatest development in Diodontus (Fig. 2), is a reliable character used by this and earlier workers. This carina is also present but not highly elevated in species of Psen, Pseneo, Mimumesa and Pluto, but is reduced to a simple tubercle between the antennal orbs in Mimesa and Ammopsen. The presence and shape of transverse facial carinae (Fig. 2) are also useful in a more restricted sense in distinguishing species within some genera.

The clypeus is a head structure which frequently deserves

special attention. Some species, particularly in Mimesa, have the clypeus armed with a subapical tumidity which assumes many different shapes. The structure of the apical margin of the clypeus is one additional feature which can be used to advantage in determining several species and genera. An extreme condition is attained in Pseneo where the distinctly thickened and denticulate apex distinguishes this taxon from all other Psenini genera. At the species level, in several genera, truncate vs. dentate conditions of the clypeal apices are frequently useful diagnostic features.

The posterio-ventral surface of the head yields characters which are also of diagnostic value, especially in the relation of the occipital carina to the hypostomal carina (Fig. 1 A,B). This character is of a more profound nature than heretofore realized. Thus in Pluto the occipital carina is widely separated from the hypostomal carina; in Mimesa, Mimumesa, Pseneo and Psen the occipital carina meets or nearly meets the hypostomal carina some distance before the median ventral line; and in Ammopsen the occipital carina is restricted to the dorsal regions and becomes evanescent laterally. Additionally, whether coalescence of the occipital carina with the hypostomal carina or the obsolescence of the occipital carina a short distance before juncture with the hypostomal carina occurs is a feature frequently distinct between species within Mimesa and Mimumesa (Fig. 1 B,C).

The antennae have valuable diagnostic usage in relation to sensory structures which are evident medially on the ventro-lateral areas of the flagellar segments in the males of most species. The position, shape and numbers of these sensory areas which are known as antennal tyloides, frequently differ between species.

Thorax. The classical terms are generally used in this paper in reference to the thorax (Fig. 1E,F). Thus, I differ from Van Lith (1959) and continue use of the term postscutellum in preference to metanotum. As seen in Fig. 1F, I follow Snodgrass (1935) in terminology of sulci on the mesoscutum. The terms prepectus and prepectal carinae are used in contrast to Van Lith who considers these as the epicnemia and epicnemial carinae respectively. While that author believes the shape of the prepectus to be of considerable diagnostic value at the species level with the Indo-Australian Psenini and deBeaumont (1937) makes some use of this character in discussing the European material, I have not found it to be of significant value in nearctic forms. However, the form of both the acetabular carina (of Richards, 1956) and the prepectal carina have value at the generic level of classification in the nearctic psenines.

Most authorities agree on the importance of the structure and ornamentation of the propodeum as useful taxonomic characters. This paper departs from earlier studies in

respect to the naming of various propodeal areas (Fig. 3). Thus, the term enclosure used herein is restricted to the impressed medial area, while the area anterior to this enclosure is termed the dorsal area and the lateral concentrices are called the lateral spheres. The ornamentation of the dorsal area and lateral spheres are frequently important at the species level.

Abdomen. Morphologically, the propodeum should be considered as the first abdominal segment. However, I have followed the usage of most Hymenopterists and accepted the petiole as representing the first abdominal sternite with the first abdominal tergite forming a posterior, cap-like structure, distinct from the petiole per se (Fig. 3). The remainder of the abdomen needs little clarification except for the pygidium and terminalia. In Psenini females, there commonly occurs a conspicuous pygidium delimited by a carina along the posterior and lateral margins. This structure is seldom evident in the males. The ornamentation of the female pygidium, particularly with reference to the size, density and distribution of punctations and the character of pubescence, is frequently of taxonomic value. Additionally, the ratio or pygidial width to length is of importance especially for species of the genus Mimesa. The genitalia of the males (Figs. 5-8) have been evaluated during the present study. Some early authors confused the sexes and erroneously c

considered the spur-like projection of the eighth abdominal sternite of the male to represent occasionally the female "stinger" or more commonly the male aedeagus. Actually, the male aedeagus is a paired structure, the form of which has limited use in species descrimination. In the genus Mimumesa, however, the paired parameres (lateral lobes) exhibit variations of a distinctive nature.

Wings. Wing venation and cells have been named according to a modified Comstock-Needham system (Fig. 4). While early workers assigned considerable taxonomic importance to wing venational patterns at both generic and species levels, these patterns today are generally considered to be of little value. One exception to this involves the hind wing where the origin of the cubital vein with respect to the transverse cubito-anal vein (Fig. 4) allows separation of the Diodonti and Pseni groups. Distinctive difference in wing venation of this nature assumes considerable phylogenetic importance when one assumes these differences to be basic and not adaptive.

PHYLOGENY

The taxon considered here is the Psenini which, along with the related tribe Pemphredonini, comprises the subfamily Pemphredoninae of the family Sphecidae. The author accepts but does not dogmatically hold to the taxonomic level at which these groups should be considered. Differences of opinion

exist, not with the relationships, but to whether Psenini and Pemphredoninae are deserving of tribal, subfamily or family rank. Such differences of opinion are inseparably linked to the level at which the sphecoid wasps are considered -- here treated as a super family.

While problems involving phylogenetic relationships remain, there is little doubt that the Psenini are more closely related to the Pemphredonini than to any other group of Sphecoid wasps. Many workers have indicated or pointed to the similarity of external features between adults of these two tribes (Latreille 1796, Ashmead 1899, Rohwer 1910, Malloch 1933, and deBeaumont 1937). Recently, Evans (1959) has found important similarities in structure of the larval forms of the two groups. It is additionally recognized that the known biologies of members of Pemphredonini and Psenini are markedly similar.

The tribe Psenini is represented in the nearctic region by seven genera, Diodontus Curtis, Psen Latreille, Pseneo Malloch, Mimesa Shuckard, Mimumesa Malloch, Pluto Pate and Ammopsen Krombein. It is with these genera alone that I confine my discussion on phylogenetic relationships, since representatives of the Hawaiian genera, Caenopsen Cameron, Deinomimesa Perkins, and Nesomimesa Perkins were not available for study.

In the absence of paleontological records and because of

a paucity of ecological evidence, comparative anatomy remains the most important basis for an interpretation of psenine phylogeny. The author's interpretation of the phylogenetic relationships of the nearctic genera are shown in Fig. 9.

It is apparent that fundamental differences in wing venation and facial carina in the adults and in the appearance of the integument, apical form of the spinnerets and shape of head and mandibles of the larvae set the genus Diodontus apart from other genera. That Diodontus is, in fact, phyletically distinct from Psen is further supported through comparisons of European and Asian material.

Pluto, whose origin is probably nearctic and whose known distribution is restricted to the western hemisphere, appears to occupy a position intermediate between Diodontus and Psen s.l. Thus, while Pluto shares with Diodontus fundamental wing venational features such as the second and third submarginal cells of the forewing each receiving a recurrent vein and cubitus of hind wing arising distad of the cubito-anal cross vein, adult features, such as the ornamentation of the facial area, and various larval characteristics place it nearer Psen. Additionally, however, the complete occipital carina, shortness of the third submarginal cell, dentate condition of the labrum, dorso-ventrally flattened hypopygidial spine in the male and bristles on the mid and hind coxae in the females are features unique to this genus. These latter features readily

attest to the early separation of Pluto from Diodontus on a monophyletic line. Hence, while I believe both genera have a common ancestry apart from other genera of the tribe and collectively belong to the Diodonti group, these two genera have become widely separated.

It has been previously proposed (Malloch 1933, deBeaumont 1937, Spooner 1948, Van Lith 1959 and others) that there are close ties between Mimesa and Mimumesa which are reflected in the historical placement of these two taxa in the same genus. It should be pointed out, however, that Spooner appears to do so with some reservation. He states, "Some well-marked differences exist between this group (Mimumesa) and the foregoing Mimesa ....." Van Lith carries this further in stating, "The differences between Mimesa and Mimumesa are more striking than those between Mimumesa and Psen s. str." I agree with Spooner and Van Lith to the greater extent that Mimesa and Mimumesa should no longer be considered as two aggregates of the same genus. To continue to recognize these as being so closely related reflects a phylogenetic relationship not supported by anatomical, biological or geographic evidence. The possession of a complete longitudinal facial carina and the well-developed episternauli are of sufficient import to place Mimumesa phylogenetically closer to Psen and Pseneo than to Mimesa. The lack of the aforementioned characters in members of Mimesa attest to an early divergence of this taxon from the

Psen phyletic line. Mimumesa therefore, is considered to have separated from the Psen-Pseneo line at a later date than Mimesa.

Both Psen and Pseneo have much in common anatomically. Features such as the evenly rounded petiole, which lacks a longitudinal row of dorso-lateral hairs, longitudinal frontal carina on the frons, transverse facial carinae and many other features attest to the close relationship of these two genera. So many features are common and exclusive to these two taxa as to leave little doubt that Psen and Pseneo share a closer relationship to one another than to any other psenine genus. Additionally, this relationship validates the contention that Psen and Pseneo have a more recent common ancestral line than do any other North American genera within the tribe.

Finally, the origin of Ammopsen is still obscure. Tribally unique features indicate that this taxon's origin was paleolytic. Zoogeographic considerations stand in contradiction to this opinion in that distribution and speciation within Ammopsen support the theory of recent evolution. Further studies are needed before an understanding of the phylogeny of this genus can be gained. Presently, anatomical features such as the shortened form of the petiole, the presence of a simple tubercle between the antennal bases, lack of a longitudinal median carina on the upper frons, lack of transverse facial carinae and the incomplete character of the

mesoepisternal suture combine to place Ammopsen closer phylogenetically to Mimesa than any other genus.

SYSTEMATICS

The Psenini are slender forms with a distinctly petiolate abdomen. They differ from the Pemphredonini in having three submarginal cells in the forewing, the petiole formed by the anterior portion of the first abdominal sternite and with the male eighth sternite narrowed, curved and produced caudally to a sharp point.

Within the tribe Psenini there are two supergeneric groups, Diodonti and Pseni. The Diodonti group, containing the genera Diodontus and Pluto, is characterized by the cubitus in the metathoracic wing arising distad of the cubito-anal cross vein (Fig. 4C). The Pseni group, containing the genera Psen, Pseneo, Mimesa, Mimumesa and Ammopsen, is characterized by the cubitus in the metathoracic wing arising proximad of the cubito-anal cross vein (Fig. 4B).

KEY TO THE GENERA OF NEARCTIC PSENINI

1. Metathoracic wing with cubitus arising distad of the cubito-anal cross vein (Fig. 4C). Diodonti group..... 2

-- Metathoracic wing with cubitus arising proximad of the cubito-anal cross vein (Fig. 4B). Pseni group..... 3

2. Occipital carina meeting hypostomal carina; frons with a highly elevated, median, longitudinal carina often expanded between the antennal bases; pronotum black, lateral lobes never whitish in color..... Diodontus Curtis

-- Occipital carina seldom meeting hypostomal carina, usually considerably distant from it on the mid-ventral line; frons with a thin, feebly elevated, median, longitudinal carina; pronotum with lateral lobes usually whitish in color..... Pluto Pate

3. Median dorsal faces of propodeum with at least some evidence of striations or rugose-reticulations; pronotum with a subapical, transverse carina..... 4

-- Median dorsal faces of propodeum granular, never striate or rugose-reticulate; pronotum lacking a subapical, transverse carina..... Ammopsen Krombein

4. Meso-anepisternum distinctly sculptured and generally dull, striate or striato-punctate..... 5

-- Meso-anepisternum generally smooth and shining, never striate or striato-punctate, at most with only a few

scattered punctures..... 6

5. Clypeus thickened apically and bearing three thickened teeth..... Pseneo Malloch

-- Clypeus not thickened apically, rounded, emarginate, or notched but lacking distinctly thickened teeth..... ..... Mimesa Shuckard

6. Petiole sulcate and carinate above, with a series of piliferous punctures near the latero-dorsal edges, hairs quite conspicuous..... Mimumesa Malloch

-- Petiole neither carinate nor sulcate above, although a weak carina may be evident at the latero-dorsal edges, never with a series of piliferous punctures along the latero-dorsal edges..... Psen Latreille

Group Diodonti

Genus Diodontus Curtis

Diodontus Curtis 1834:496; Malloch 1933:3
Psenulus Kohl 1896:293; deBeaumont 1937:76; Pate 1937:23 (synonymy)
Neofoxia Viereck 1901:338; Malloch 1933:3 (synonymy)
Diodontus (Diodontus), Krombein 1950:35; 1951:958

Head. Front with a well-developed longitudinal median carina, highly elevated between bases of antennae, sulcate except in alienus, frequently with transverse facial carinae extending laterally from base of longitudinal median carina; clypeus with apex not noticeably thickened, bearing two blunt teeth near middle, separated by a shallow emargination; occipital carina complete dorsally and laterally, meeting hypostomal carina on venter; antennae of female clavate, nearly filiform in male.

Thorax. Pronotum with well-developed, subapical, transverse carina becoming more cristate laterally, lateral lobes dark; prepectus triangular, well-defined; episternal suture of mesopleuron incomplete, effecting only a partial separation of the mesoepisternum; mesoepisternum with upper portion similar in sculpture to lower portion; propodeum variably ornamented, striate to rugose-reticulate, lightly striate in some extra-limital forms of frontalis; forewing with first recurrent vein joining second submarginal cell, second recurrent

vein received by the third submarginal cell or interstitial with the second transverse cubital vein, second submarginal cell greatly narrowed above; hind wing with juncture of M and Cu veins distad of cu-a cross vein; hind femur with inner surface sparsely covered with fine hairs, distinctly shorter than those on other surfaces.

Abdomen. Petiole variable, with or without a complete dorsal sulcus or dorso-lateral carinae, without a well-developed series of hairs laterally, and usually not greater in length than hind femur; pygidium of female present or absent, when present, narrow, delimited posteriorly and laterally by a carina.

DISCUSSION. Diodontus belongs in the Diodonti group along with the genus Pluto. The genus Diodontus, however, is readily distinguished from Pluto by the possession on the frons of a highly elevated longitudinal median carina, and by the coalescence of the occipital and hypostomal carinae on the venter of the head. Superficially, Diodontus can be separated from Pluto by the more robust form, blacker and shinier color, and the uniform darkness of the lateral lobes of the pronotum.

The synonymy as indicated has already been discussed in detail in the historical section of the work. The North American species considered here are all referable to the

subgenus Diodontus. Apparently the other subgenus, Eopsenulus Gussakovskij, is confined to Asia (Gussakovskij, 1933).

GENEROTYPES. Diodontus -- Psen pallipes Panzer (orig. des.). Psenulus -- Psen fuscippenis Dahlbom. Neofoxia -- Psen atrata Panzer (orig. des.).

DISTRIBUTION. Members of the genus appear to be southern in nearctic distribution. Northern-most collection records are from New Hampshire and Washington. The genus is not known from Canada. Four species are currently recognized from the continental United States.

BIOLOGY. All members of the genus appear to nest in hollow-stemmed or pithy-stemmed plants or in previously formed burrows in wood. None is known to nest in the ground. In the west, pithy-stemmed plants, such as Sambucus and Sumac appear to be the more highly favored nesting sites. Little is known of the prey of American forms but conjecture, based on Spooner's study of English species, leads me to believe that the prey is typically, perhaps entirely, Aphididae.

KEY TO THE NEARCTIC SPECIES OF DIODONTUS

1. Antennae slightly clavate, 12-segmented (females)..... 2

-- Antennae filiform, 13-segmented (males)..... 5

2. Face with interantennal prominence distinctly sulcate, transverse carinae present; hind margins of abdominal sternites four and five fringed with long hair..... 3

-- Face with interantennal prominence not distinctly sulcate, transverse carinae absent; hind margins of abdominal sternites four and five not fringed with long hairs..... alienus Krombein

3. Longitudinal carina on face not sulcate for some distance above its intersection with the transverse facial carinae 4

-- Longitudinal carina on face sulcate to its intersection with the transverse facial carinae.... trisulcus (Fox)

4. Mesoscutum with posterior, dorsal marginal area bearing distinct longitudinal striations; petiole with a broad median sulcus and lateral carinae present on nearly entire length; eastern North America..... atratus parenosas Pate

-- Mesoscutum with posterior, dorsal marginal area generally lacking distinct longitudinal striations; petiole with a broad median sulcus and lateral carinae present only on basal third of dorsum; Western North America..... frontalis (Fox)

5. Antennal tyloides prominent, usually discernible on at least first nine flagellar segments..... 6

-- Antennal tyloides apparently lacking or indistinct, in which case they are linear and not discernible beyond the sixth flagellar segment..... 7

6. Antennal tyloides linear, found on all but last flagellar segment..... alienus Krombein

-- Antennal tylides small, oval, absent from at least last two flagellar segments..... frontalis (Fox)

7. Longitudinal carinae on face narrowly sulcate to its intersection with the transverse carinae.... trisulcus (Fox)

-- Longitudinal carina on face not sulcate for some distance above its intersection with the transverse carinae..... atratus parenosas Pate

Diodontus (Diodontus) alienus Krombein

Diodontus (Diodontus) alienus Krombein, 1950:38-39

DESCRIPTION. Female. Length averaging near 6 mm., forewing approximately 4 mm. long. Black; flagella beneath, fore and mid tibiae beneath, fore and mid tarsi and narrow annulations at apices of femora, tibiae and first three segments of the hind tarsi pale reddish. Wings hyaline, stigma and veins fuscous. Vestiture silvery, often with some gold tones, glistening, dense and decumbent on clypeus and lower frons, generally sparser and more erect elsewhere on head and thorax.

Head. Shining except clypeus and frons; clypeus densely, finely punctate, apical margin with two small median teeth, separated by a narrow, shallow emargination, teeth slightly projected forward, resulting in a subapical furrow on clypeus; lower frons densely, finely punctate; longitudinal frontal carina very narrowly sulcate from base to interantennal area (extremely narrowly sulcate in some forms), narrowly expanded in interantennal area, expanded portion shorter than sulcate portion, transverse facial carina absent; upper frons above antennal orbs more coarsely punctate than below orbs, punctations subcontiguous medially, becoming sparser laterally; interocellar area elevated, distance from lateral ocellus to eye slightly less than distance between lateral ocelli (8:9 in

holotype); vertex punctate, occasionally feebly striate except immediately above ocellar area; gena distinctly striato-punctate.

Thorax. Shining; mesonotum moderately punctate, denser laterally and anteriorly; mesoscutum not striate along posterior margin; mesopleuron moderately punctate; propodeum with dorsal area shiny, with fine parallel striations, coarser and reticulate medially; enclosure narrow, not well-defined; lateral spheres generally rugose-reticulate. Legs with outer apical surface of mid tibia with a short ridge anteriorly margining a less distinctive flattened area, posteriorly margined by a row of spines.

Abdomen. Shining; petiole subequal in length to hind femur, dorsum sulcate and laterally carinate on basal third only; second sternite without a rounded ridge circumscribing a semi-elliptical depressed area at base; sternites four and five without apical fringes of long hairs; pygidium very narrow, finely punctate, delimited posteriorly and laterally by a weak carina.

Male. Length averaging 6 mm., forewing 4 mm. Black; red as in female. Wings as in female. Vestiture as in female but lacking gold tones.

Head. Differing from female as follows: longitudinal frontal carina present, but not sulcate; transverse facial carina present, not extending beyond antennal sutures; upper

frons above antennal orbs obliquely striato-punctate, striate laterad and caudad of lateral ocelli. Antennal tyloides well-developed, elongate, cristate, becoming smaller on last three flagellar segments, often only faintly indicated on last segment.

Thorax. As in female except propodeal sculpture variable, generally more rugose than in female.

Abdomen. Petiole longer than hind femur, dorsum of petiole sulcate at base; second abdominal sternite without a semi-elliptical area delimited by a marginal carina.

TYPES. Holotype, female, Camino, Eldorado Co., California, June 27, 1948 (H.M.G. and D. Townes) (U. S. National Museum); allotype, not designated.

MATERIAL EXAMINED: CALIFORNIA: Oakhurst, Madera Co., May 23, 1942 (3 males, one from Eriodictyon sp.), June 1, 1942 (E. G. Linsley) (1 male); Herkey Creek, San Jacinto Mtns., June 11, 1939 (E. S. Ross) (1 female); Hemet Lake, Riverside Co., May 17, 1959 (E. I. Schlinger) (1 male); Bluff Camp, San Rafael Mtns., San Bernardino Co., June 29, 1959 (F. D. Parker) (1 male); Camp Baldy, July 29, 1950 (R. M. Bohart) (1 male); Tanbark Flat, Los Angeles Co., July 11, 1950 (R. M. Bohart) (2 males); Crystal Lake, June 28, 1956 (R. M. Bohart) (1 male); Sequoia Nat. Pk., Ash Mt., (E. I. Schlinger) (1 male).

NEVADA: Verdi, Washoe Co., April 21, 1960 (F. D. Parker) (2 males, reared from cells in Elderberry (Sambucus sp.) stems).

DIAGNOSIS. This species can be readily distinguished from other nearctic species of the genus in the female by the absence of transverse facial carinae and lack of long hair fringes on the fourth and fifth abdominal sternites, and in the male by the elongate and cristate form of the antennal tyloides which are present on at least all but the first and last flagellar segments.

DISCUSSION. According to Krombein (1950) alienus is an anomalous member of the nearctic fauna which has its closest relative in the palaearctic species schenki (Tournier) recorded by deBeaumont (1937) from north and central Europe.

BIOLOGY. Members of this species appear to nest in hollow or pithy-stemmed plants. I have examined some specimens taken by Mr. Frank Parker at Verdi, Nevada, which he reared from stems of Sambucus sp. While no host records are known, it is probable that members of this species stock their nests with Aphididae or some closely related small Homopteran. Adults have been reported as visiting flowers of Fremontia sp. and Eriodictyon sp.

Diodontus (Diodontus) trisulcus (Fox)

Psen trisulcus Fox 1898:5
Neofoxia trisulcus, Viereck 1901:342
Diodontus trisulcus, Malloch 1933:4 (in part); Pate 1944:133 (synonymy)
Diodontus (Diodontus) trisulcus, Krombein 1950:37
Diodontus corusanigrens Rohwer 1920:228; Malloch 1933:5 (synonymy)
Diodontus sulcatus Malloch 1933:6; Pate 1944:133 (synonymy)

DESCRIPTION. Female. Length averaging near 6.5 mm. long, forewing near 5 mm. Black; fore tarsi and undersides of fore tibiae red, dark red on apices of mid and hind tibiae and tegulae. Wings hyaline, stigma and veins fuscous. Vestiture silvery, glistening, dense and decumbent on clypeus and lower frons.

Head. Shining except for clypeus and lower frons; clypeus densely, finely punctate, apical margin with two median teeth separated by a narrow emargination; lower frons densely, finely punctate; longitudinal frontal carina prominent, sulcate throughout entire length, more widely sulcate for some distance above junction with transverse facial carinae; transverse facial carinae present, arcuate beneath antennal orbs, extending laterad to at least outer margins of antennal orbs; upper frons and vertex bright and shiny, with fine, widely spaced punctations, never striate, above lateral ocelli; interocellar area elevated, distance from lateral ocelli to eye slightly more than distance between lateral ocelli; gena

striate, not or only weakly so on upper half.

Thorax. Bright and shiny; mesonotum moderately punctate with punctations separated by more than two times their diameter; mesoscutum striate along posterior margin; mesopleuron bright and shiny, only sparsely to moderately punctate; propodeum with dorsal area shiny, with well-developed parallel striations; enclosure narrow but well-defined; lateral spheres of propodeum striate, less strongly so than on dorsal area. Legs with apex of mid tibia evenly convex, without a short ridge anteriorly margining a less distinctive flattened area.

Abdomen. Shiny; petiole shorter than hind femur, dorsal surface sulcate throughout, with dorsal and lateral carinae well-developed; second sternite with well-developed, elliptical area, delimited laterally and caudally by a continuous carina; sternites four and five with apical fringes of long hairs; pygidium present, narrow, finely punctate, delimited posteriorly and laterally by a weak carina.

Male. Length averaging 5.4 mm., forewing 4 mm. Black; red as in female, and with undersides of antennae yellow. Wings as in female. Vestiture similar to female on head.

Head. Differing from female as follows: longitudinal frontal carina prominent but only narrowly sulcate (very narrowly in some specimens) throughout entire length. Antennae densely but evenly punctate, tyloides well-developed, linear and oblique along color interface, inconspicuous and

not evident beyond sixth flagellar segment.

Thoracic and abdominal characteristics much as in female but lacking a pygidium.

TYPES. Of trisulcus: holotype, female, "New Hampshire" (Academy of Natural Sciences, Philadelphia); allotype, not designated. Of corusanigrens: holotype, female, St. Louis, Missouri, July 6, 1918 (Phil Rau) (U. S. National Museum, No. 21990); allotype, not designated. Of sulcatus: holotype, female, Harrisburg, Pennsylvania, 1921 (Champlain) (U. S. National Museum, No. 44205); allotype, not designated.

The holotype of corusanigrens is a female and not a male as the original author described.

DISTRIBUTION. This species ranges extensively throughout the eastern area of the nearctic region, having been collected from Tennessee north to New Hampshire and west to Kansas and Michigan.

MATERIAL EXAMINED. MICHIGAN: Chippewa Co., June 25, 1960 (R. & K. Dreisbach) (1 male); Saginaw Co., July 17, 1957 (R. Dreisbach) (1 female); Benzie Co., July 4, 1957 (R. & K. Dreisbach) (1 female).

D. C.: Washington, May, 1935 (1 female).

DIAGNOSIS. This species can be characterized by the continuous sulcate condition of the longitudinal frontal carina

which, while only narrowly sulcate in the male, is nevertheless sulcate throughout.

DISCUSSION. The nomenclatorial problems encountered in a consideration of this species have been adequately discussed by Pate (1944) and Krombein (1950).

This species occurs sympatrically throughout most of its range with atratus parenosas but is not closely related to that subspecies. Indeed, trisulcus does not appear to bear any close relationship to other nearctic forms nor has it been determined to have a homologue in the palaearctic region. At present, the origin of trisulcus and its relationships with other nearctic Diodontus species remains obscure.

BIOLOGY. This species has been reared from nests in Sambucus and Rhus but nothing is known as to its prey.

Diodontus (Diodontus) frontalis (Fox)

Psen frontalis Fox 1898:4 (female)
Neofoxia frontalis, Viereck 1901:342
Diodontus frontalis, Malloch 1933:5 (male); Krombein 1950:35
Diodontus occidentalis Malloch 1933:5 (female); Krombein 1950:35 (synonymy)
Diodontus hesperus Pate 1944:133 (new name for occidentalis); Krombein 1950:35 (synonymy)

DESCRIPTION. Female. Length averaging near 7 mm., forewing approximately 4.3 mm. Black; flagella with at least ventral surface of last nine segments, fore tarsi entirely, at least

apices of mid and hind tarsi, and parts of fore tibiae, and tegulae reddish. Wings hyaline, stigma and veins fuscous. Vestiture silvery, glistening, most dense on clypeus, frons, and caudal margin of prothorax.

Head. Moderately shining; clypeus densely, finely punctate, apical margin with two distinct median teeth separated by a narrow emargination; lower frons very finely punctate, appearing chagreened; longitudinal median carina very narrow at base, flared outward between bases of antennae, width of the flared portion subequal to its length, flared portion deeply sulcate; transverse facial carinae well-defined, extending laterally to near outer margins of antennal orbs where carinae turn upward; upper frons shiny, punctate, frequently striate-punctate laterally; inter-ocellar area slightly elevated, distance from lateral ocellus to eye near equal to distance between lateral ocelli (distance between ocelli slightly greater in holotype), lateral ocelli flanked laterally by a distinct depression; vertex shiny, punctate but not striate; gena distinctly striate, deeply so in some forms.

Thorax. Shining; mesonotum moderately punctate with punctations generally separated by distances greater than their diameters; mesoscutum punctate, if striate then striations confined to area immediately anterior to posterior margin; mesopleuron moderately punctate with deeply set punctations; propodeum with sculpture highly variable, dorsal area

shiny, with well-developed parallel striations; enclosure well-defined; lateral spheres ranging from distinctly rugose to a punctate but not striate condition. Legs with apex of mid tibia evenly convex, without a short ridge anteriorly margining a less distinctive flattened area.

Abdomen. Shiny; petiole slightly shorter than hind femur, dorsal surface with a smooth, elevated, often V-shaped area on anterior half, lateral carinae present only anteriorly; second sternite with a semi-elliptical depressed area at base, delimited laterally and caudally by a continuous carina; sternites four and five with apical fringes of long hairs; pygidium commonly present, narrow, delimited posteriorly and laterally by a weak carina.

Male. Length averaging near 6 mm., forewing approximately 4 mm. long. Black; fore tibiae and fore tarsi, mid tarsi, frequently apices of hind tarsal segments red; distal portions of ventral surface of flagella to entire ventral surfaces, and tegulae reddish. Wings as in female. Vestiture much as in female.

Head. Differing from female in the following respects: Clypeus and lower frons ruffoned and irregularly punctate; inter-antennal prominence less highly elevated than in female, sulcate portion narrower; upper frons rough and irregularly punctate, distinctly striate laterally and behind posterior ocelli; postocellar area extremely short on dorsal

surface; lateral ocelli flanked by a shallow depression; ocellar triangle well elevated; distance between lateral ocelli slightly greater than distance between later ocellus and margin of eye; gena irregularly striate. Antennal tyloides oblong-ovate in shape, elevated, distinct on at least first six flagellar segments, less distinct or absent on next three flagellar segments.

Thorax. Mesoscutum shiny, moderately punctate, punctures deep, generally separated by distances greater than puncture diameters, occasionally striato-punctate along posterior margin; propodeum with sculpture variable.

Abdomen. Petiole longer than hind femur (approximately ten to seven ratio); remainder similar to female but never with a pygidium.

TYPES. Of frontalis: holotype, female, "Utah" (Academy of Natural Sciences, Philadelphia); allotype, not designated. Of occidentalis: holotype, female, Tallac Lake, Tahoe, California, July 25, 1915 (E. P. Van Duzee) (U. S. National Museum, No. 44204); allotype, not designated.

DISTRIBUTION. Western United States, including California, Arizona, New Mexico, Nevada, Utah, Colorado and Washington.

MATERIAL EXAMINED. CALIFORNIA: Samuel Springs, Napa Co., May 5, 1955 (R. M. Bohart) (1 female, 3 males), (D. L.

Dahlsten) (1 male), Sept. 5, 1955 (R. M. Bohart) (4 males), April 28, 1956 (R. C. Bechtel) (2 males), May 28, 1953 (R. M. Bohart) (1 female), May 27, 1956 (E. I. Schlinger) (1 female), March 29, 1956 (E. I. Schlinger) (1 male), May 30, 1953 (J. C. Hall) (1 male); Big Pine Cr., Inyo Co., 7,500 feet, June 1, 1941 (R. M. Bohart) (2 males), May 18, 1947 (R. M. Bohart) (3 females), June 17, 1951 (R. C. Bechtel) (2 females); Falls Pub. Camp, San Bernadino Mtns., July 11, 1956 (R. M. Bohart) (2 females); Camp Baldy, Los Angeles Co., June 26, 1950 (K. G. Whitesell) (1 female), July 7, 1952 (R. M. Bohart) (1 female); Nelson Pt., Plumas Co., July 5, 1952 (E. I. Schlinger) (1 female); 4 mi. w. Quincy, June 25, 1949 (E. I. Schlinger) (1 female); San Rafael, Marin Co., May 7, 1953 (H. L. Mathis) (1 female); San Antonio R. S., Santa Clara Co., June 27, 1953 (G. A. Marsh) (1 female); Pollock Pines, Eldorado Co., July 14, 1948 (J. W. MacSwain) (1 female); Snowline Camp, June 20, 1948 (P. D. Hurd) (2 females, on Ceonothus); Mt. Diablo, Contra Costa Co., April 21, 1953 (P. D. Hurd) (1 male); Hat Creek, Shasta Co., June 1, 1941 (E. G. Linsley) (1 male); Paradise Camp, Mono Co., May 7, 1960 (A. E. Menke) (11 females, 3 males), May 7, 1960 (F. D. Parker) (16 females, 1 male); Dodge Ridge, Tuolomne Co., Aug. 7, 1960 (A. S. Menke) (1 female).

ARIZONA: 5 mi. w. Portal, Cochise Co., May 3, 1956 (M. Statham) (2 males); Bear Wallow, Mt. Lemmon, June 25, 1953

(A. H. Dietrich) (1 female).

COLORADO: Gt. Sand Dunes, Alamosa Co., July 20, 1954 (H. E. and M. A. Evans) (1 female); Elbert Creek, June 30 (2 females).

NEVADA: Verdi, Washoe Co., June 14, 1960 (F. D. Parker) (1 female); Kyle Canyon, Clark Co., at 7,000 feet, Aug. 11, 1959 (F. D. Parker) (1 female); Lamoille Canyon, Elko Co., at 6,300 feet, Sept. 14, 1957 (R. C. Bechtel) (1 female); Ely, White Pine Co., Aug. 3, 1960 (T. R. Haig) (1 female).

NEW MEXICO: Cimarron Canyon, Colfax Co., June 12, 1956 (R. and K. Dreisbach) (1 female).

DIAGNOSIS. In spite of variability of characters between specimens of the species frontalis, this species can be easily recognized by the pronounced width of the interantennal prominence of the longitudinal median carina in the female (and to a degree in the male); by the well-developed, prominent, oval tyloides in the male, and by the lateral carina and median sulcus of the petiole which are commonly restricted to the basal portions on the dorsal surface of the petiole in both sexes.

DISCUSSION. This species appears to exhibit the greatest variation in structure of all Diodontus taxa found in North America. In the female, particularly, considerable variation can be found in the punctation of the head and thorax,

sculpturing of the propodeum, size of the sulcate portion of the petiole, and with the presence or absence of a distinct pygidium. While it appears this species as presently delimited may actually be a complex of species, great variation can be found in anatomical features of individuals from apparently the same population. In the case of males, the greatest variation exists. Color in the male is somewhat variable, particularly with the degree of redness of the antennae. Antennal tyloides also vary in size and number with some specimens bearing small tyloides on all but the last two flagellar segments, while others possess tyloides restricted to the first six flagellar segments. In common with the females, males exhibit marked variation in both the punctation of the head and thorax and in the character of the petiole. Additionally, the semi-elliptical depressed area at the base of the second sternite may also vary in form.

As noted in the re-description, there is a profound variation in regard to the propodeal sculpture adjacent to the enclosure. This variation ranges from a distinctly rugose to a simple punctate condition. The purely punctate condition was previously considered a specific character by Malloch who described occidentalis to contain those specimens possessing this feature. Krombein, however, recognized the propodeal feature as an intra-specific variation and relegated occidentalis to synonymy with frontalis. My examination of a

large series of specimens has led me to share Krombein's conclusion.

BIOLOGY. Unknown, except for floral records which indicate visitations to Ceanothus sp.

Diodontus (Diodontus) atratus parenosas Pate

Diodontus trisulcus (Fox), Malloch 1933:4 (misidentified)
Diodontus parenosas Pate 1944:133 (new name for trisulcus Malloch, not Fox)
Diodontus atratus parenosas, Krombein 1950:36-37

The nominative subspecies occurs in Europe.

DESCRIPTION. Female. Length averaging near 5.3 mm., forewing averaging 4 mm. long. Black; antennae beneath, fore tibiae and tarsi, and tegulae red; legs, not including coxae, reddish-brown. Wings hyaline, stigma and veins fuscous. Vestiture silvery, most dense on clypeus and frons.

Head. Shining, except on clypeus and frons; clypeus densely, finely punctate and chagreened, apical margin bearing two well-developed teeth separated by a shallow emargination; lower frons finely punctate, appearing chagreened to granular; longitudinal frontal carina well-developed, narrow at base, flared outward between antennal bases as a sulcate interantennal prominence which is more than twice as long as broad, carina not sulcate between base and expanded portion, non-sulcate lower portion at least as long as width of sulcate

portion; transverse facial carinae present, extending beyond antennal bases; upper frons punctate to striato-punctate; interocellar area elevated, lateral ocelli with pronounced lateral depressions, distance from lateral ocellus to eye approximately equal to distance between lateral ocelli; vertex mostly striato-punctate; gena distinctly striate.

Thorax. Shining; mesonotum moderately punctate with punctations separated by distances greater than punctation diameters; mesoscutum with posterior margin at least partly striate; mesopleuron very shiny, with widely spaced punctations; propodeum with dorsal area shiny and bearing highly developed parallel carinae, enclosure distinct, broadly open in front, evanescent posteriorly; lateral spheres mostly striate and granular dorso-anteriorly, finely rugose-reticulate posteriorly and posterio-laterally. Legs with apex of mid tibia evenly convex, without a short ridge anteriorly margining a less distinctive flattened area.

Abdomen. Shiny; petiole shorter in length than hind femur, dorsally sulcate throughout, lateral carinae commonly complete, second sternite with well-developed, semi-elliptical area delimited laterally and posteriorly by a rounded carina; abdominal sternites four and five with apical fringes of long hairs; pygidium narrow, delimited posteriorly and laterally by a weak carina.

Male. Much as in female with following differences:

Head. Interantennal prominence of longitudinal median carina smaller. Antenna moniliform, first segment shorter in length than combined length of segments two and three, tyloides linear, indistinct on first five flagellar segments and apparently lacking on last six segments.

Thorax. Fore tibia less robust and lacking a flattened inner area.

Abdomen. Second abdominal sternite with semi-elliptical area not nearly as pronounced as in female, rounded carina smaller, incomplete posteriorly.

TYPES. Of atratus parenosas: lectotype (designated by Krombein 1950), female, Washington, D. C., May 25, 1924 (J. R. Malloch) (U. S. National Museum).

DISTRIBUTION. Eastern United States. A single collection from St. George, Utah, is questionable.

MATERIAL EXAMINED. NEW YORK: Flushing, Long Island, June 24, 1893, May 21, 1945; Goshen, Sept. 7, 1910 (all females).

D. C.: Washington, July 13, 1924 (J. R. Malloch) (1 male); June 5, 1944 (G. E. Bohart) (1 female).

DIAGNOSIS. This subspecies may be differentiated from the other nearctic species of the genus by its generally smaller size. The smaller inter-antennal prominence and the sulcate condition of the petiole, along with the character of the

tyloides in the male, at once allows separation from frontalis. The non-sulcate condition of the longitudinal carina below the interantennal prominence allows separation from trisulcus. It can be quickly distinguished from alienus by the characters mentioned in the key.

DISCUSSION. That parenosas is merely a subspecies of atratus has been previously discussed by Krombein (1950). From that worker's observations and comparisons with European material, it appears that the North American form deserves only subspecific ranking.

BIOLOGY. Some specimens in the U. S. National Museum bear labels indicating they were taken from burrows in pine wood. Krombein (1955, 1962) reports atratus parenosas nesting in beetle burrows. Spooner (1948) notes that the nominative subspecies atratus atratus in Great Britain has been found under similar circumstances and additionally taken from hollow canes and straw. While Spooner cites the prey of the European forms as "typically, perhaps entirely, Aphididae," the single prey record for atratus parenosas in North America has been contributed by Krombein (1955) reporting the prey as Drepanaphis acerifoliae (Thos.).

Krombein (1962) reports specimens of atratus parenosas collected at Arlington, Va., infested with hypopial nymphs of the acarid mite Lackerbaueria krombeini Baker. The hypopi

were distributed at random over the body surfaces of the hosts.

Genus Pluto Pate

Psenia Malloch 1933:16 (preoccupied)
Pluto Pate 1937:15; Krombein 1951:962

Head. Front with a longitudinal median carina extending from a generally large tumid area between bases of antennae to median ocellus and with transverse facial carinae wanting; clypeus with apex not noticeably thickened, truncate and lacking any distinct dentate condition or central emargination; occipital carina complete dorsally and laterally, seldom meeting hypostomal carina on venter; antennae of female clavate, near filiform in male.

Thorax. Pronotum with well-developed, sub-apical transverse carina generally more cristate laterally, lateral lobes nearly always yellowish-white; prepectus triangular, well-defined; mesopleuron with episternal suture incomplete, effecting only partial separation of mesoepisternum; mesoepisternum with upper portion never striate, commonly sparsely punctate; propodeum less variable than most other genera of tribe, commonly striate to finely reticulate; forewing with first recurrent vein joining second submarginal cell and second recurrent vein received by third submarginal cell; second submarginal cell narrowed above; hind wing with juncture of M and Cu veins distad of cu-a cross vein; hind femur

with inner surface mostly devoid of pubescence and frequently with a longitudinal "felt line" near the ventral edge.

Abdomen. Petiole commonly convex above without dorsal sulcus or distinct dorso-lateral carinae, lacking a series of dorso-lateral hairs, and shorter in length than hind femur; pygidium present in female, of normal shape, and delimited laterally and posteriorly by a carina.

DISCUSSION. Pluto is here assigned to the Diodonti group of the Psenini. Members of the genus Pluto are readily distinguished from those of Diodontus by the complete separation of the occipital carina from the hypostomal carina on the venter of the head and by the absence of a highly elevated condition of the longitudinal median carina on the head. Superficially, species of Pluto can be separated from those of Diodontus by those characters indicated in the Discussion section under the genus Diodontus.

Pluto is a relatively newly recognized genus of the Psenini, having been erected by Malloch (1933). Regrettably, Malloch assigned the name Psenia to the present taxon, creating a case of homonymy with Psenia Kirby. Pate (1937) recognized this nomenclatorial error and proposed the new name Pluto for Psenia Malloch nec. Kirby. Apart from this nomenclatorial error, Malloch's paper on Pluto is still adequate for present day usage and therefore I have attempted no

revision of this genus. The key to the species of Pluto presented here is Malloch's original key with little modification. Additionally, I have presented only a synonymical and distributional list of the nearctic species of Pluto and suggest that for more detailed information the reader refer to Malloch's paper.

GENEROTYPE. Mimesa tibialis Cresson (orig. des.)

DISTRIBUTION. Members of this genus appear to be southern in nearctic distribution with no records of their occurrence north of latitude 40° yet known. Members of numerous species of Pluto, however, appear to be very common in the southern portions of the continental United States. The genus Pluto is also known from the neotropical region but has not been recorded outside of the new world.

BIOLOGY. Little is known on the biology of members of this genus. Through conjecture, Krombein (1951) has stated, "nothing is known of the biology of Pluto..... but presumably the species nest in soil." Collection information accompanying museum specimens indicate that individuals of Pluto are frequently collected from flowers such as Helianthus spp., Asclepias spp., Acacia sp., and Cassia sp.

KEY TO THE NEARCTIC SPECIES OF PLUTO OCCURRING NORTH OF MEXICO

1. Antennae 13-segmented (males)..... 2

-- Antennae 12-segmented (females)..... 12

2. Mesopleuron highly polished, meso-katepisternum sparsely and shallowly punctured, meso-anepisternum entirely impunctate; ocellar area depressed in center, with a few minute punctations, lateral ocelli each with a deep impressed line posteriorly which does not extend across between posterior margins; antennal flagellum distinctly clubbed, apical segment three times as wide at base as basal segment at apex, no segments with tyloides or other modifications; lateral angles of pronotum sharply produced, almost spike-like; abdomen black, apices of tergites brownish-yellow..... clavicornis (Malloch)

-- Mesopleuron generally chagreened or alutaceous, rarely shiny, meso-anepisternum punctate or with other sculpturing; ocellar area generally not depressed in center, usually distinctly and strongly punctate; antennal flagellum not clubbed or only inconspicuously so, with tyloides on at least some intermediate segments; lateral angles of pronotum not spike-like; abdomen variously colored..... 3

3. Antennal flagellum with conspicuous, shiny, papilla-like tyloides on centers of three or four mid segments, segments

immediately basad and apicad of these with short carinae not extending along full length on segments; mesopleuron coarsely sculptured, deeply punctate to rugose-reticulate; hind tarsi yellowish-white, apical segment browned above..... 4

-- Antennal flagellum flattened beneath, with pronounced carina-like tyloides on segments three to eight; mesopleuron not coarsely sculptured..... 5

4. Antennal flagellum with tyloides lacking on basal three segments; meso-anepisternum and prepectus rugose-reticulate..... longiventris (Malloch)

-- Antennal flagellum with tyloides lacking on basal two segments; meso-anepisternum and prepectus coarsely punctate, sometimes more or less vertically striato-punctate ..... suffusa (Fox)

5. Hind tarsi with all segments more or less infuscated, apices of basal four segments usually narrowly yellow... 6

-- Hind tarsi either entirely yellow or with apical and rarely basal segments partly browned..... 7

6. Antennal flagellum with linear tyloides extending the complete length of each segment, not present on first or last segments; meso-anepisternum alutaceous, with fine punctations; meso-katepisternum alutaceous, with moderately-sized punctations, mostly granulose on posterior third..... sayi (Rohwer)

-- Antennal flagellum with linear tyloides which do not extend the complete length of any segment, not present on first segment, weakly evident on last segment; meso-anepisternum coarsely rugose-reticulate; meso-katepisternum more coarsely and closely punctate than in sayi, coarsely striate on posterior third..littoralis (Malloch)

7. Abdomen with third sternite more than one-half as wide as length medially; stigma dark; occipital carina moderately elevated, vertical, without a well-defined mid-ventral notch..... 8

-- Abdomen with third sternite less than one-half as wide as length medially; stigma pale yellow; occipital carina strongly elevated, not vertical, with a well-defined mid-ventral notch..... pallidistigma (Malloch)

8. Antennal flagellum with well-elevated, nearly angular tyloides on segments five to eight, highest elevated points of tyloides occur near middle of segments; propodeum with lateral spheres striate or slightly reticulate, appearing granulose under low magnification..... ..... angulicornis (Malloch)

-- Antennal flagellum with moderately-elevated tyloides present on intermediate segments, highest elevated points of tyloides occur well beyond middle of segments; propodeum with lateral spheres coarsely rugose-reticulate... 9

9. Mesonotum with surface mostly deeply and transversely

striato-punctate; mesoscutellum longitudinally striato-punctate; vertex with fine striations..... 10

-- Mesonotum with surface deeply and subcontiguously punctate, never distinctly striate; mesoscutellum mostly finely punctate, vertex never striate..... 11

10. Petiole at least partly red; legs except coxae fulvous-yellow..... rufibasis (Malloch)

-- Petiole entirely black; legs with hind femora partly black ..... marginata (Malloch)

11. Propodeum with medial portion of dorsal area divided, interrupted by a longitudinal carina extending forward from the enclosure..... 26

-- Propodeum with medial portion of dorsal area large, not interrupted by a median longitudinal carina..... ..... aerofacies (Malloch)

12. Hind tarsi largely fuscous, yellow only at extreme apices of basal four segments (pale color is best seen when tarsus is viewed from tip against the light)..... 13

-- Hind tarsi yellow, sometimes with apical segment browned above..... 15

13. Meso-anepisternum moderately, coarsely, longitudinally striate or striato-punctate..... 14

-- Meso-anepisternum evenly and prominently convex, microscopically chagreened or alutaceous and with very small isolated punctures; meso-katepisternum with posterior

portion granulose, never striate..... sayi (Rohwer)

14. Mesoscutellum slightly alutaceous, not highly polished, punctate with punctations large, deep and isolated on each side, closer set and smaller in size along posterior margin..... littoralis (Malloch)

-- Mesoscutellum smooth, not alutaceous, highly polished, punctate with punctations small, widely spaced except closely set along posterior margin..... texana (Malloch)

15. Legs with all femora and tibiae fulvous-yellow, tarsi whitish-yellow; abdominal tergites one and two red, petiole castaneous, remainder of abdomen glossy black, apices of tergites brownish-yellow; meso-anepisternum coarsely striato-punctate, meso-katepisternum not distinctly shining because of presence of fine chagreening or alutaceous sculpturing, punctures on upper portion large and continguous, gradually becoming smaller and wider spaced ventrally; prepectus vertically striato-punctate on upper part; propodeum with dorsal area and lateral spheres largely rugose-reticulate; face with distinct golden tinged hairs..... rufibasis (Malloch)

-- Legs with femora and tibiae not entirely yellow, frequently all femora and hind tibiae partly black or dark brown; abdomen with first tergite at least largely black; other characters not entirely as above..... 16

16. Intercarinal space in center of ventral surface of head as

wide as first segment of fore tarsus seen from above.. 17

-- Intercarinal space in center of ventral surface of head not nearly as wide as first segment of fore tarsus seen from above..... 18

17. Abdomen partly bright red, apex of second and usually all of third tergites red; fore and mid tibiae whitish-yellow, more reddish-yellow on anterior and posterior surfaces, hind tibiae as usual, yellowish-white on basal third or less and dark brown or fuscous beyond; meso-pleura with moderately large, shallow punctures, well separated on upper half of anepisternum, more closely placed and smaller on katepisternum..... suffusa (Fox)

-- Abdomen glossy black, apices of tergites brownish-yellow; all tibiae black except fore pair whitish-yellow on dorsal surface almost to apex and on almost all of anterior surface, mid and hind pairs whitish-yellow on basal third or less; mesopleura with anepisternum closely striato-punctate, upper part of katepisternum coarsely, sub-transversely wrinkled, with a few large punctures, lower part unwrinkled but with large, sparse, shallow punctures ..... longiventris (Malloch)

18. Mesonotum at most punctate, not at all rugose or furrowed on disk or anterior lateral angles; meso-katepisternum not wrinkled longitudinally on upper half..... 19

-- Mesonotum coarsely, irregularly rugose-punctate, almost

furrowed, especially on disk and anterior lateral angles; mesopleura very minutely chagreened, alutaceous, anepisternum with shallow punctures and traces of longitudinal wrinkles, katepisternum much more distinctly wrinkled and punctate on upper half, sculpturing becoming fainter below; propodeum coarsely rugose-reticulate, becoming striate basally alongside enclosure; abdomen glossy black, apices of tergites conspicuously brownish-yellow to testaceous in color..... ..... marginata (Malloch)

19. Abdomen very conspicuously red on at least some part of one or more of first three tergites; propodeum with very fine straight striae on almost entire lateral spheres but becoming finely reticulate or granulate posteriorly... 20

-- Abdomen not at all red on any part of any of first three tergites, though apices of these may be brownish-yellow; propodeum, except in minuta, more coarsely sculptured on lateral spheres with posterior portion coarsely reticulate..... 23

20. Occipital carina well-developed, continuous mid-ventrally; abdomen with second tergite entirely red or sometimes black anteriorly; species not less than 7 mm. in length... 21

-- Occipital carina becoming nearly evanescent for some distance on either side of mid-ventral line; abdomen with

second tergite entirely red; species not more than 7 mm. in length..... angulicornis (Malloch)

21. Head with occipital and hypostomal carinae distinctly separated on venter..... 22

-- Head with occipital and hypostomal carinae subcontiguous on venter..... arenivagus Krombein

22. Abdomen with second tergite extensively blackened on anterior half or more; meso-anepisternum dull, appearing granulose, with extremely fine punctations; hind tarsus with apical segment brown, contrastingly darker than other segments..... brevipetiolata (Rohwer)

-- Abdomen with second tergite entirely red; meso-anepisternum distinctly shining, faintly alutaceous, with widely separated, distinct punctations; hind tarsi with all segments whitish-yellow in color... pallidistigma (Malloch)

23. Propodeum with lateral spheres mostly rugose-reticulate; species about 7 mm. in length..... 24

-- Propodeum with lateral spheres very finely striate; species about 5 mm. in length..... minuta (Malloch)

24. Petiole shorter than length of first abdominal tergite; pygidium more than twice as long as its width at center; propodeum with lateral spheres rugose..... 25

-- Petiole as long as length of first abdominal tergite; pygidium less than twice as long as its width at center; propodeum with lateral spheres finely reticulate, dorsal

area without a large, glossy diamond-shaped central portion..... albifacies (Malloch)

25. Face with silvery-white pubescence; propodeum without a large, diamond-shaped glossy central portion of dorsal area..... tibialis (Cresson)

-- Face with brassy-yellow pubescence; propodeum with a large, diamond-shaped glossy central portion of dorsal area..... aerofacies (Malloch)

26. Antennal flagellum with tyloides present on segments two through ten..... arenivagus (Krombein)

-- Antennal flagellum with tyloides present on segments two through eight..... tibialis (Cresson)

Pluto tibialis (Cresson)

Mimesa tibialis Cresson 1872:488 (male and female)
Psenia tibialis, Malloch 1933:49
Pluto tibialis, Krombein 1951:962

TYPE. Holotype: female, "Texas" (G. W. Belfrage) (U. S. National Museum); allotype "?"

DISTRIBUTION. Ranging from the District of Columbia south to Louisiana, west to Texas and Missouri.

Pluto aerofacies (Malloch)

Psenia aerofacies Malloch 1933:49 (female and male)
Pluto aerofacies, Krombein 1951:962

TYPE. Holotype: female, Rosser, Texas, June 28, 1905, on Cassia sp., (C. R. Jones) (U. S. National Museum, No. 44219); allotype, Victoria, Texas, July 8, 1907, on Acacia sp. (J. D. Mitchell).

DISTRIBUTION. Southern Texas and into Mexico.

Pluto albifacies (Malloch)

Psenia albifacies Malloch 1933:50 (female)
Pluto albifacies, Krombein 1951:962

TYPE. Holotype: female, Sioux City, Iowa, July 13, 1929 (C. N. Ainslie) (U. S. National Museum, No. 44220).

DISTRIBUTION. Iowa.

Pluto clavicornis (Malloch)

Psenia clavicornis Malloch 1933:50 (male)
Pluto clavicornis, Krombein 1951:962

TYPE. Holotype: male, Arizona (Baker collection, No. 2546) (U. S. National Museum, No. 44221).

DISTRIBUTION. Arizona

Pluto suffusa (Fox)

Psen suffusus Fox 1898:18 (female)
Psenia suffusa, Malloch 1933:51 (female and male)
Pluto suffusus, Krombein 1951:962

TYPE. Holotype: female, Las Cruces, New Mexico, Aug. 14 (Cockerell) (Philadelphia Academy of Sciences).

DISTRIBUTION. Ranging from New Mexico to California.

Pluto longiventris (Malloch)

Psenia longiventris Malloch 1933:52 (male and female)
Pluto longiventris, Krombein 1951:962

TYPES. Holotype: male, Higley, Arizona, July 15, 1917 (E. G. Holt) (U. S. National Museum); allotype; female, Gilbert, Arizona, July 18, 1917 (E. G. Holt).

DISTRIBUTION. Southern portions of Arizona and California.

NOTES. Members of this species have been collected from flowers of orange, cotton, Helianthus and Asclepias.

Pluto pallidistigma (Malloch)

Psenia pallidistigma Malloch 1933:52 (male and female)
Pluto pallidistigma, Krombein 1951:962

TYPES. Holotype: male, Mount Superstitution, near Higley, Arizona, July 24, 1917 (E. G. Holt) (U. S. National Museum, No. 44223); allotype: female, Cotulla, Texas, May 11, 1906 (J. C. Crawford).

DISTRIBUTION. Recorded from Southern Arizona and Southern Texas.

Pluto rufibasis (Malloch)

Psenia rufibasis Malloch 1933:53 (male and female)
Pluto rufibasis, Krombein 1951:962

TYPES. Holotype: female, Jekyl Island, Georgia, June 25, 1923 (W. L. McAtee) (U. S. National Museum, No. 44224, (incorrectly published as No. 44424 in Malloch's (1933) paper); allotype; male, Tifton, Georgia.

DISTRIBUTION. Georgia.

Pluto marginata (Malloch)

Psenia marginata Malloch 1933:54 (male and female)
Pluto marginata, Krombein 1951:962

TYPES. Holotype: female, "Louisiana" (Baker collection) (U. S. National Museum, No. 44225); allotype: male, "Louisiana" (Baker collection).

DISTRIBUTION. Southern South Carolina to Southern Louisiana.

Pluto brevipetiolata (Rohwer)

Psenulus (Neofoxia) brevipetiolata Rohwer 1910:100 (female)
Psenia brevipetiolata, Malloch 1933:54
Pluto brevipetiolata, Krombein 1951:962

TYPE. Holotype: female, Los Angeles County, California (Coquillett) (U. S. National Museum, No. 12855 (incorrectly listed as No. 12355 in Rohwer's (1910) paper).

DISTRIBUTION. Southern and Central California.

NOTES. A female of this species was collected from the flowers of Asclepias at Lindsay, California, by W. A. Davidson.

Pluto sayi (Rohwer)

Psenulus (Neofoxia) sayi Rohwer 1910:100 (female)
Psenia sayi, Malloch 1933:55 (male)
Pluto sayi, Krombein 1951:962

TYPE. Holotype: female, Onaga, Pottawatomie County, Kansas (Crevecoeur) (U. S. National Museum, No. 12856 (incorrectly listed as No. 12356 in Rohwer's (1910) paper).

DISTRIBUTION. This species is apparently widely distributed in the Austral zone of the United States from Washington, D. C., south to Alabama and west to California.

Pluto texana (Malloch)

Psenia texana Malloch 1933:56 (male and female)
Pluto texana, Krombein 1951:962

TYPES. Holotype: female, Brownsville, Texas, 1921 (J. C. Bridwell) (U. S. National Museum, No. 44226); allotype: female, Brownsville, Texas, 1921 (J. C. Bridwell).

DISTRIBUTION. Southeastern Texas.

Pluto littoralis (Malloch)

Psenia littoralis Malloch 1933:56 (male and female)
Pluto littoralis, Krombein 1951:962

TYPES. Holotype: male, Chesapeake Beach, Maryland, July 3, 1924 (J. R. Malloch) (U. S. National Museum, No. 44227); allotype: female, Chesapeake Beach, Maryland, July 2, 1916 (W. L. McAtee).

DISTRIBUTION. Maryland, Florida.

Pluto angulicornis (Malloch)

Psenia angulicornis Malloch 1933:58 (male and female)
Pluto angulicornis, Krombein 1951:962

TYPES. Holotype: male, Plano, Texas, July, 1907 (E. S. Tucker) (U. S. National Museum, No. 44229); allotype: female, Plano, Texas, July, 1907 (E. S. Tucker).

DISTRIBUTION. Texas.

Pluto minuta (Malloch)

Psenia minuta Malloch 1933:59 (female)
Pluto minuta, Krombein 1951:962

TYPE. Holotype: female, San Diego, Texas, May 16 (Ashmead collection) (U. S. National Museum, No. 44230).

DISTRIBUTION. Southern Texas.

Pluto arenivagus Krombein

Psenia angulicornis var. Malloch 1933:48 (female)
Pluto arenivagus Krombein 1949:268 (male and female; Krombein 1951:962

TYPES. Holotype: male, Kill Devil Hills, Dare County, North Carolina, May 28, 1948 (on sandy barrens) (K. V. Krombein)

(U. S. National Museum); allotype: female, Kill Devil Hills, Dare County, North Carolina, May 27, 1948 (K. V. Krombein).

DISTRIBUTION. North Carolina and Georgia.

NOTES. This species recorded as occurring on sandy barrens.

Group Pseni

Genus Ammopsen Krombein

Ammopsen Krombein 1959:18

DESCRIPTION. Head. Mandible of female simple, of male with a small inner tooth near apex; labrum short, broad, front margin rounded; clypeus not apically thickened, apical margin rounded or transverse; frons with tubercle between antennal bases; longitudinal median carina and transverse facial carinae absent; occipital carina present dorsally not extending onto venter; upper gena of female with several long, separated ammochaetae in a row along posterior margin.

Thorax. Pronotum with posterior margin rounded in lateral aspect, subapical, transverse dorsal carina absent; mesopleuron with prepectus rounded, not carinate anteriorly; episternal suture incomplete, not separating mesoepisternum into distinct anepisternal and katepisternal sclerites, upper portion not strikingly different in sculpture from lower portion; propodeum without transverse, oblique carinae, enclosure not set off by marginal carinae; dorsum strongly chagreened, without median striations; forewing with first recurrent vein received proximad of first transverse cubital and second recurrent vein received distad of second transverse cubital, the second submarginal cell narrowed above,

not receiving a recurrent vein; hind wing with cubital vein arising proximad of cu-a cross vein; fore tarsus of female with comb; hind femur with inner surface bearing scattered, short hairs.

Abdomen. Pygidial area of female broad and nearly flat, lateral carinae absent; sixth sternite of male with a subapical row of thick hairs; seventh sternite of male with median lobe truncate at apex.

DISCUSSION. Ammopsen belongs in the Pseni group, differing from the Diodonti in the position of juncture of the M and Cu veins with respect to the cu-a cross vein in the hind wing. Further, Ammopsen appears more closely related to Mimesa than to Mimumesa or Psen in that Ammopsen, like Mimesa, has a tubercle on the frons but lacks any evidence of a longitudinal median carina or transverse facial carinae. It is immediately separated from all other Pseni forms, however, by the lack of a transverse carina on the pronotum, lateral and ventral evanescence of the occipital suture and the finely punctate or chagreened character of the dorsum of the propodeum.

GENEROTYPE. Ammopsen masoni Krombein (orig. des.)

DISTRIBUTION. Apparently confined to the southwestern United States, and perhaps adjacent Mexico, presently known to occur

in New Mexico, Arizona and California.

BIOLOGY. Nothing is known of the habits of members of this monotypic genus. The temporal ammochaetae and the tarsal pecten of females of the only known species leads one to believe, as Krombein suggests, that members of this genus nest in sandy soil.

Ammopsen masoni Krombein

Ammopsen masoni Krombein 1959:19-20

Krombein's descriptions of this species were very complete and so the descriptions here-in are only slightly modified from the original.

DESCRIPTION. Male. Length 3.7 - 4.0., forewing, including tegula, approximately 2.3 mm. Shining black, abdomen, excluding petiole, occasionally red, with dark brown patches on the middle of fourth tergite and most of fifth tergite; the following whitish ... mandibles, except apex, antennae beneath, tegulae, apex of lateral angles of pronotum, apices of femora, narrow stripes on tibiae externally, tibial spurs, and tarsi, except last tarsal segments. Wings hyaline, veins mostly testaceous.

Head. Width 1.3 X height, vertex rounded above eyes; clypeus, face, and genae with dense oppressed silvery

pubescence obscuring sculpture; clypeus with apical margin nearly truncate; frons small with a tubercle between bases of antennal insertions; ocelli small, in an equilateral triangle, the postocellar distance slightly greater than ocellocular distance (11-10 in holotype); occipital carina present dorsally; antennae short, flagellum clavate, flagellar segments three to ten becoming progressively more produced at apex beneath, segments four, five and last concave beneath.

Thorax. Pronotum rounded dorsally, without subapical, transverse carina, scutum and scutellum with fine punctures separated by more than puncture width; propodeum with dorsal area broad and triangulate, granulate (appears very finely rugose-reticulate under high magnification), without evidence of striations at least medially, not margined by carinae; lateral spheres granulate; propodeal enclosure deep and narrow.

Abdomen. Petiole short, about equal in length to hind coxa, dorsal surface smooth, neither sulcate nor carinate; abdominal sternites one to five, and apical halves of tergites of the same somites with thin oppressed silvery hairs, less dense than on head and thorax; first abdominal tergite with anterior face perpendicular to petiole.

Female. Length 3.6 - 4.1 mm.; forewing including tegula approximately 2.9 mm. Colored as in male except tarsi entirely pale and abdomen entirely red; pubescence slightly

infuscated on apical tergites, legs black and white to red and white as in male.

Head. Antennae short and clavate, flagellar segments not produced beneath at apex.

Thorax. Propodeum with dorsal area bearing weak transverse rugulae except anteriorly where they radiate from base; fore femur with a few long scattered setae behind.

Abdomen. Pygidial area broad, surface with small punctures separated by less than the diameter of a puncture and bearing inconspicuous, decumbent setae, lateral margins straight, not carinate.

TYPES. Holotype, male, Thousand Palms, Riverside County, California, April 16, 1955 (W. R. M. Mason) (Division of Entomology, Ottawa, Canada); allotype, female, Thousand Palms, Riverside County, California, April 12, 1955 (W. R. M. Mason) (Division of Entomology, Ottawa, Canada).

DISTRIBUTION. Southern portions of California, Arizona and New Mexico.

Previous records: CALIFORNIA: Thousand Palms, Riverside Co., April 7-26, 1955 (W. R. M. Mason) (9 males, 1 female); Box Canyon, Riverside Co., April 27, 1952 (P. H. Timberlake) (3 females, on Eriogonum thomasii); Blythe, Riverside Co., April 24, 1955 (W. R. M. Mason) (2 females); 4.7 mi. e. Bonds Corner, Imperial Co., April 14, 1949 (P. H.

Timberlake) (1 male); Borego, San Diego Co., April 2, 1953 (P. D. Hurd) (1 female), April 25, 1954 (M. Wasbauer) (1 female, on Croton californicus); Helendale, San Bernadino Co., May 27, 1955 (W. R. M. Mason) (2 males).

NEW MEXICO: 5 mi. e. Deming, Luna Co., Sept. 13, 1957 (P. H. Timberlake & R. C. Dickson) (3 males, on Euphorbia fendreli).

MATERIAL EXAMINED. Besides paratypes previously mentioned, I have seen additional material from: ARIZONA: Wilcox, Cochise Co., Aug. 18, 1958 (R. M. Bohart) (2 males, on Euphorbia sp.)

BIOLOGY. Little is known of this insect's habits except that the species probably nests in sandy soil and stocks these nests with small Homoptera. Both males and females have been reported as visiting flowers of Euphorbia sp., Euphorbia fendreli, Eriogonum thomassii, and Croton californicus.

Genus Mimumesa Malloch, new status

Psen (Mimumesa) Malloch 1933:16; deBeaumont 1937:45; Van Lith 1959:50
Mimesa (Mimumesa), Krombein 1951:961

Head. Front with a longitudinal median carina extending from a generally tumid area between bases of antennae to

median ocellus and commonly with transverse facial carinae extending laterally from tumid area to or toward lower, inner margins of antennal sutures; clypeus with apex not noticeably thickened, usually with two closely placed and rounded medial teeth; occipital carina complete dorsally and laterally meeting or nearly meeting hypostomal carina considerably distant from median line on venter; antennae of female clavate, less so in male.

Thorax. Pronotum with well-developed, subapical, transverse carina becoming more cristate laterally, lateral lobes dark; prepectus triangular, well-defined; mesopleuron with episternal suture complete and distinct, dividing mesoepisternum into well-defined anepisternite and katepisternite, anepisternite shiny, usually very finely punctate (striato-punctate only in cylindrica (Fox)) showing a distinct contrast to the more deeply sculptured katepisternite; propodeum variably ornamented, commonly striate or rugose-reticulate; fore-wing with both recurrent veins commonly received by second submarginal cell, second submarginal cell narrowed above; hind wing with juncture of M and Cu veins proximad of cu-a cross vein; hind femur with inner surface evenly covered with fine hairs.

Abdomen. Black, except red at base in one color form of clypeata (Fox); petiole dorsally carinate, with two parallel or posteriorly converging carinae forming a centrally raised

portion, sulcate medially, generally with dorso-lateral carinae, dorso-lateral margins bearing a well-developed series of hairs; pygidium present in females, delimited posteriorly and laterally by a carina.

DISCUSSION. Members of this genus belong to the Pseni group. Within the Pseni, Mimumesa can be distinguished from Mimesa on the basis of the much greater ornamentation of the dorsal surface of the petiole, the presence of a generally complete longitudinal median carina on the face, and the presence of a distinct and complete mesoepisternal suture which sets off a normally smooth, shiny and impunctate anepisternum. The lack of a distinctly thickened apex of the clypeus at once distinguishes members of Mimumesa from those of Pseneo, while the presence of dorso-lateral and dorsal carinae on the petiole serves to divorce Mimumesa from Psen. Apart from differences in size between members of Mimumesa and Ammopsen (average of 7 mm. in Mimumesa to 4 mm. in Ammopsen), the presence of a complete occipital carina to or near juncture with the hypostomal carina and a transverse, subapical, dorsal, pronotal carina separates Mimumesa from Ammopsen in which those aforementioned characters are lacking.

I have elevated Mimumesa to full generic status rather than continuing to recognize this taxon as a subgenus of Mimesa. The very basic modification of the mesopleuron, in

addition to more minor features such as the presence of a longitudinal median carina, transverse facial carinae, and dorsal carinae on the petiole, are characters common to all species of Mimumesa and absent from all species of Mimesa. These, then, attest to anatomical reasons for considering Mimumesa as a valid genus. Differences in biology also contribute to the present opinion and these are discussed below.

GENEROTYPE. Psen niger Packard (orig. des. by Malloch)

DISTRIBUTION. Widespread throughout the United States, Canada and Alaska.

BIOLOGY. Nesting habits, prey, and other biological information of the nearctic members of the genus are generally unknown. Infrequent observations on North American forms, however, indicate that they are similar in habits to their European counterparts. If such proves to be the case, then the following biological attributes with respect to the nearctic forms may be considered probable: The species nest in cavities in wood or stems utilizing burrows previously excavated by wood boring insects, or taking advantage of hollow-stemmed or pithy-stemmed vegetation such as Rhus spp. or Sambucus spp. No species of Mimumesa are known to nest in the soil. In this habit, they differ decidedly from species of Mimesa, all of which appear to be soil nesters. From

Spooner's (1948) observations, it appears likely that the Mimumesa species utilize members of the families Fulgoridae and Cicadellidae as prey and transport their "catch" with their mandibles.

Differences in the biologies between Mimumesa and Mimesa, used to support my contention on the generic status of the aforementioned taxon, can be easily recognized by comparing the above with biology information available for Mimesa. From European records and infrequent observations on nearctic species the following inferences on Mimesa biology may be drawn: Mimesa spp. excavate burrows in the soil, and store Cicadellidae which are carried ventrally with the mesothoracic legs.

KEY TO THE NEARCTIC SPECIES OF MIMUMESA OCCURRING NORTH OF MEXICO

1. Antennae 12-segmented; pygidium present (females)..... 2

-- Antennae 13-segmented; pygidium absent (males)..... 11

2. Clypeus covered with silvery pile..... 3

-- Clypeus covered with dense golden pile..... 21

3. Pygidium about as broad as the last visible abdominal tergite, and densely covered with large piliferous punctures..... 4

-- Pygidium narrow, at most one-half as broad as last visible abdominal tergite, sparsely punctate and hairy..... 7

4. Tegulae glossy, impunctate on at least a portion of posterior area; occipital carina complete to juncture with hypostomal carina; abdomen never red..... 5

-- Tegulae dull, ornamented throughout; occipital carina becoming evanescent on venter adjacent to hypostomal carina; abdomen frequently, in part red.... clypeata (Fox)

5. Antennae with underside of flagellum at least partly yellow in color..... 6

-- Antennae entirely dark in color..... propinqua (Kincaid)

6. Fore tibia partly to entirely yellow; vertex and gena never striate; apex of clypeus broadly truncate; petiole with dorsal surface not medially sulcate... mellipes (Say)

-- Fore tibia never yellow; vertex and gena frequently striate; apex of clypeus broadly edentate; petiole frequently with a median, dorsal sulcation occasionally evident only at base..... canadensis (Malloch)

7. Meso-anepisternum glossy, impunctate or with at most a few fine punctations..... 8

-- Meso-anepisternum striate..... cylindrica (Fox)

8. Mesoscutum at most partly striato-punctate, never with a series of complete longitudinal striations..... 9

-- Mesoscutum with many parallel longitudinal striations throughout..... longicornis (Fox)

9. Vertex strongly striate; western North America..... 10

-- Vertex finely punctate, never striate; central and eastern North America..... leucopus (Say)

10. Gena dull, distinctly striate..... mixta (Fox)

-- Gena glossy, finely punctate..... columbiana n. sp.

11. Tegulae glossy, impunctate on at least a portion of posterior area; occipital carina complete to juncture with hypostomal carina; abdomen never distinctly red..... 12

-- Tegulae dull, punctate throughout; occipital carina evanescent on venter adjacent to hypostomal carina; abdomen frequently, in part red..... clypeata (Fox)

12. Meso-anepisternum shiny, at most finely punctate..... 13

-- Meso-anepisternum dull, distinctly striate.....
..... cylindrica (Fox)

13. Mesoscutum punctate to striato-punctate, never with a series of complete longitudinal striations..... 14

-- Mesoscutum with many parallel longitudinal striations throughout..... longicornis (Fox)

14. Antennal flagellum partly to entirely yellow in color... 15

-- Antennal flagellum brown to black in color..... 18

15. Antennal flagellum dark above, yellow beneath to at least the 10th segment, distinct tyloides present on at least segments four, five and six..... 16

-- Antennal flagellum reddish-yellow above, yellowish beneath on a little more than basal third, dark beyond, tyloides apparently absent..... johnsoni (Viereck)

16. Antennal flagellum with tyloides not highly elevated, present on at least segments two through six, last segment similar in color to preceding segments..... 17

-- Antennal flagellum with highly-elevated darkened tyloides confined to segments four through six, last segment contrastingly darker than preceding segments.. mellipes (Say)

17. Antennal flagellum with tyloides usually restricted to segments two through six; frons, vertex and frequently gena striato-punctate to striate..... canadensis (Malloch)

-- Antennal flagellum with tyloides present on segments two through eight; frons, vertex, and gena glossy, finely punctate, never striate..... sodalis n. sp.

18. Antennal flagellum with oblong to ovate tyloides present

on segments two through ten..... 19

-- Antennal flagellum with ovate tyloides present on segments seven and eight..... 20

19. Vertex without striations; medial notaulices distinct; propodeum with anterior portions of lateral spheres lacking a series of striations..... propinqua (Kincaid)

-- Vertex with at least some fine striations; medial notaulices not distinct; propodeum with anterior portions of lateral spheres bearing a distinct series of striations... ..... columbiana n. sp.

20. Vertex and gena distinctly striate; gena punctate in a few forms; western North America..... mixta (Fox)

-- Vertex and gena never striate; central and eastern North America..... leucopus (Say)

21. Mesoscutum chagreened, striato-punctate; antennal flagellum with apical segment brown to black above; tibiae entirely or with undersides ferrugineous to yellow..... ..... johnsoni (Viereck)

-- Mesoscutum polished, minutely punctate; antennal flagellum with apical segment reddish above; tibiae dark brown entirely..... fuscipes (Packard)

Mimumesa johnsoni (Viereck), n. comb.

Mimesa johnsoni Viereck 1901:340 (male and female)
Psen (Mimumesa) johnsoni Malloch 1933:19
Mimesa (Mimumesa) johnsoni Krombein 1951:961

DESCRIPTION. Female. Length averaging 9.5 mm. (type 8.5 mm.). Forewing 7 mm. long. Black; tarsi, tegulae, undersides of tibiae (occasional entire tibiae), commonly tibio-femoral joints, including upper tibiae and trochanto-femoral joints, yellow to reddish. Antenna brown; frequently undersides of flagellar segments one through five yellowish, flagellar segments one and two nearly to entirely reddish in some other forms. Wings hyaline, stigma and veins fuscous, veins lighter in color toward wing base. Vestiture golden, dense and decumbent on clypeus and lower frons, generally silvery elsewhere.

Head. Glossy; clypeus and lower frons chagreened to finely granular; clypeus more than twice as broad as long, wider than narrowest distance between compound eyes, apex truncate to slightly emarginate, occasionally with a tooth on each side of truncate portion; longitudinal median carina distinct, complete from a tumid area between antennal bases to median ocellus; transverse facial carinae wanting; upper frons moderately, strongly, evenly punctate above antennal bases, punctations becoming sparser laterally and on vertex; distance from compound eye to lateral ocellus about one and

one-half times distance between lateral ocelli; post-ocellar furrow and tumid area absent; gena glossy with at most fine piliferous punctations; occipital carina complete to its juncture with hypostomal carina; antennae with first flagellar segment longer than scape and more than two-thirds length of flagellar segments two and three.

Thorax. Moderately shiny; mesoscutum striato-punctate, chagreened; notaulices distinct, parallel from anterior to posterior margins; mesoscutellum with deep equally-spaced punctations, some chagreening; postscutellum granular; mesopleuron polished, anepisternum mostly impunctate, katepisternum impunctate, somewhat striate posteriorly; propodeum with dorsal area glossy, broad at middle, traversed on either side by a series of highly elevated, parallel carinae, lateral carinae strongly elevated, enclosure narrow, lateral spheres rugose-reticulate, distinctly duller than dorsal area, extreme lateral portions irregularly striate; tegulae shiny, impunctate anteriorly.

Abdomen. Shiny; petiole glossy, subequal in length to hind femur, dorsal surface with two rounded, posteriorly converging carinae forming a mesally sulcate area on at least anterior portion; pygidium less than one-half width of last abdominal tergite, nearly smooth to entirely chagreened, with a few deep lateral punctations mostly on apical half.

Male. Length near 8.5 mm. average, forewing 6.5 mm.

long. Color much as in female but with greater tendency toward yellow on tibiae and underside of antennae. Head more densely punctate than in female; lower frons and clypeus covered with a dense silvery pubescence about equal in length and thickness to that of female; antennal tyloides apparently wanting; pygidium absent.

TYPES. Holotype, female, Lehigh Gap, Lehigh County, Pennsylvania, July 14, 1899 (Viereck) (Philadelphia Academy of Sciences); allotype, male, Riverton, New Jersey, June 10 (C. W. Johnson).

DISTRIBUTION. Eastern seaboard from Connecticut to the Carolinas, west to western Pennsylvania.

MATERIAL EXAMINED. D. C.: Washington, June 26, 1949 (David Shappirio) (1 female).

NORTH CAROLINA: "Black Mountains" (1 female).

NEW YORK: Orient, Long Island, Aug. 27, 1957 (Roy Latham) (1 male).

CONNECTICUT: East Hartford, June 16, 1947 (Howard E. Evans) (1 male, 1 female); Weston, July 27, 1941 (1 female).

VIRGINIA: Great Falls, June 11, 1944 (G. E. Bohart) (1 female); "Virginia" (1 male).

DIAGNOSIS. Individuals of this species are the largest among the genus Mimumesa. With rare exception, the females

are readily identified by the dense golden pubescence of the clypeus and lower frons -- a characteristic which is nearly exclusive to johnsoni. The males may be distinguished by the coloration of the legs and antennae, by their large size, and by the punctations of the head and thorax.

DISCUSSION. Malloch's statement in reference to the antennal flagellum of the male in which he states, "elevation on one side of all dark segments except eleventh in male," is confusing. An examination of the type male in the Philadelphia Academy of Sciences fails to support this statement. Further, there is considerably greater variation in this species than Malloch indicated, since from an examination of relatively few specimens I have noted variation in the color of the legs, the color of the antennae, the ornamentation of the dorsal surface of petiole, and in the rare silveriness of the facial pubescence of the female.

A species Psen fuscipes was described by Packard in 1867. Regrettably no type is now known to exist, but an appraisal of Packard's description reveals that fuscipes should be assigned to Mimumesa. Comparison of the fuscipes description with that of johnsoni further discloses a very close relationship between these two species. Were it not for lack of the fuscipes type for careful examination to evaluate color and punctational differences as noted through

comparison of the written descriptions, I should consider johnsoni a synonym of fuscipes. In the absence of the fuscipes type, however, I prefer to treat johnsoni as a valid species and consider fuscipes presently as a separate species. If the status of fuscipes should be clarified in the future and found to be conspecific with johnsoni, priority will rule that the name johnsoni be sunk into synonymy and the name fuscipes preserved for this aggregate.

BIOLOGY. The nesting habits and prey records of Mimumesa johnsoni are unknown. Krombein (1951) records the species as having been collected feeding upon honeydew secreted by the Tulip-tree scale (Toumeyella liriodendri (Gmel.)).

Mimumesa fuscipes (Packard) n. comb.

Psen fuscipes Packard 1867:402 (female); Fox 1898:10; Malloch 1933:19 (? synonymy)
Mimesa (Mimumesa) fuscipes, Krombein 1951:961

I have not examined the type of this species nor have I seen any material which is referable to this taxon. The following description therefore is entirely that given by Packard (1867).

DESCRIPTION. Female. "Head broadly transverse, vertex elevated and convex, very minutely punctured on the vertex, which is smooth and polished, with a well marked prominence

between the insertion of the antennae; front broad, with an unusually deep golden dense pubescence, darker at base of the clypeus; antennae with the scape black, flagellum pale reddish beneath, black-brown above, tip reddish above. Prothorax well crested, pubescent behind; mesoscutum minutely punctured, polished; mesial and submesial impressed lines distinct, metascutellum minute; propodeum with about six fine rugae on the enclosure on each side of the well-marked mesial line, which is distinctly lozenge-shaped, posteriorly interrupted by three high distinct ridges, and still more posteriorly with distinct, though rather fine lines, diverging from the mesial furrow, hirsute. Tegulae testaceous, nervures with ferruginous nervures, paler than usual. Femora brown, sericeous, fore and middle pairs tipped slightly with ferruginous; tibiae concolorous with the femora; tarsi pale fuscous, thickly pubescent; hind tarsi concolorous with the fore tarsi. Body of the abdomen longer than the head and thorax together, being unusually long and slender, ovate lanceolate, pedicel nearly as long as abdomen is wide, grooved deeply laterally, highly polished; abdomen with the rings slightly coarctate, sutures well impressed, hind edge of second, third and fourth rings obscurely and narrowly blood red, tip acute, with a narrow, long, subtriangular, well-marked, flattened surface. Length of the body, .36; head and thorax, .22; abdomen, .14 inch."

Male. Unknown.

TYPE. Holotype, female, "Massachusetts" (Sanborn) (Philadelphia Academy of Sciences -- now apparently lost).

DISTRIBUTION. "Massachusetts."

MATERIAL EXAMINED. None

DIAGNOSIS. Females of this species can be identified, presumably by the characters presented in the key. The males are unknown.

DISCUSSION. Packard described fuscipes in 1867 from a single female. Since that time, no specimen has appeared which can be conclusively assigned to this species. Fox (1898) stated that the only specimen he had seen of this species was the type which unfortunately was without abdomen. He placed fuscipes in his group Kohlii, but did so provisionally. As Fox stated, "The examination of perfect specimens may show differences requiring the relegation of this species to another group."

Malloch (1933) has suggested that fuscipes is conspecific with Mimumesa johnsoni. As he indicated, "I have some doubt as to the synonymy suggested, but Mr. Rohwer reports my specimens belong to johnsoni, and as there is no specimen of Packard's species in Philadelphia which he could study, the matter

is left in doubt, though there is reason to believe the two names apply to the same species."

I agree with Malloch in considering the strong possibility that fuscipes and johnsoni are conspecific. Packard pointed to the existence in the fuscipes type of a dense golden pile on the face, a characteristic which is otherwise unique to johnsoni. Since, however, I have seen neither the type nor specimens of fuscipes, I prefer to consider it presently as a valid species. Should fuscipes and johnsoni later prove to be conspecific, then laws of priority will dictate that johnsoni be placed as a synonym of fuscipes.

BIOLOGY. Nothing is known on the biology of this species.

Mimumesa clypeata (Fox) n. comb.

Psen clypeatus Fox 1898:15 (male and female)
Psen (Mimumesa) clypeatus, Malloch 1933:24
Mimesa (Mimumesa) clypeata, Krombein 1951:961

DESCRIPTION. Female. Length averaging 6.5 mm., forewing 4 mm. long. Two general color forms: Black; variable degrees of red or amber confined to tarsi and tegulae, or including red on antennae and varying portions of first three abdominal segments. Wings hyaline, stigma and veins dark brown. Vesti-ture silvery, dense and decumbent on frons and clypeus, sparser and erect elsewhere on head and thorax.

Head. Shining above, clypeus and lower frons granular or densely chagreened; clypeus more than twice as broad as long and wider than the narrowest distance between the compound eyes; apex with four distinct teeth, the inner two noticeably larger; longitudinal median carina present, not pronounced, arising from a tumid area between antennal bases and extending to median ocellus; transverse facial carinae not distinct; upper frons striato-punctate, becoming distinctly striate in ocellar area and transversely striate medially and laterally on vertex; distance from compound eye to lateral ocellus at least one and one-half times distance between lateral ocelli; post-ocellar furrow and tumid area absent; gena distinctly striate; occipital carina evanescent a short distance before juncture with hypostomal carina; antennae with first flagellar segment longer than scape and approximately equal to length of flagellar segments two and three.

Thorax. Shiny; mesoscutum with a longitudinal depressed medial area, striato-punctate, becoming nearly punctate laterally in many forms (including holotype); notaulices distinct anteriorly; mesoscutellum glossy with few punctations, frequently only slightly striato-punctate along posterior margin; postscutellum shiny, granular; meso-episternum with anepisternum glossy and practically impunctate, katepisternum shiny, striated, but with striations relatively obscured on

central portions; propodeum with dorsal area glossy and traversed longitudinally by parallel cristiform striations, central portion large and smooth, lateral carinae well-elevated, lateral spheres strongly rugose-reticulate with considerable chagreening within rectangulations, some coarse and fine striations on the extreme lateral areas; tegulae dull, chagreened or with fine irregularities throughout.

Abdomen. Petiole glossy, robust, distinctly shorter than hind femur, dorsal surface with two posteriorly converging carinae forming a mesally sulcate area on at least anterior portion; pygidium broad, densely, piliferously punctate.

Male. Length averaging near 5.8 mm., forewing 3.6 mm. Coloration much as in female. Head with clypeal dentition commonly much less pronounced than in female, lateral teeth often obscure; gena commonly less striate; antennal tyloides linear to elongate-oval commonly present on first seven flagellar segments, sometimes apparently absent on flagellar segments five to seven.

TYPES. Holotype, female, "Nevada" (Gillette) (Philadelphia Academy of Sciences); allotype, male, "Colorado" (Gillette).

DISTRIBUTION. Western North America, Mexico to Alaska, eastward to New Mexico, Colorado and Saskatchewan.

MATERIAL EXAMINED. BRITISH COLUMBIA: Soda Creek, July 9, 1950 (G. J. Spencer) (1 male).

ALBERTA: Beverly, July 12, 1959 (A. R. Gittins) (1 male); Tilley, Aug. 18, 1940 (J. L. Carr) (1 female).

SASKATCHEWAN: 5 mi. e. Swift Current, June 22, 1959 (A. R. Gittins) (2 males, 1 female).

NEVADA: Alamo, Lincoln Co., July 22, 1958 (R. C. Bechtel) (1 female).

NEW MEXICO: Taylor Springs, Colfax Co., July 11, 1959 (Ray F. Smith) (1 male).

ARIZONA: Joseph City, Navajo Co., July 6, 1950 (J. W. MacSwain) (1 female); 5 mi. w. Portal, Aug. 12, 1958 (D. D. Linsdale) (1 male).

UTAH: Farmington, Aug. 28, 1948 (G. F. Knowlton & R. S. Bailey) (1 male, on Apium graveolens); Springville, June 21, 1939 (G. F. Knowlton & W. P. Nye) (1 male); Logan, July 9, 1948 (D. McComb) (1 male).

COLORADO: "Colorado" (C. F. Baker) (1 male).

IDAHO: Lawyers Cyn., Lewis Co., July 16, 1958 (A. R. Gittins) (1 female, 2 males); Grandview, Bingham Co., July 30, 1954 (A. R. Gittins) (1 female); Howe, Butte Co., July 26, 1957 (W. F. Barr) (1 male).

CALIFORNIA: Davis, Aug. 30, 1956 (R. C. Bechtel) (1 female), Aug. 24, 1956 (R. M. Bohart) (5 females), May 12, 1955 (R. M. Bohart) (2 females), Sept. 1, 1956 (J. C. Downey)

(1 female), Oct. 22, 1955 (J. C. Downey) (1 female), Sept. 12, 1954 (R. C. Bechtel) (1 female), Aug. 30, 1956 (R. C. Bechtel) (1 male); Corral Hollow, 8 mi. s. w. Tracy, San Joaquin Co., June 9, 1959 (M. Wasbauer) (1 female); Maxwell, Colusa Co., June 16, 1955 (R. E. Darby) (1 female); Colusa, Colusa Co., Aug. 15, 1955 (R. O. Schuster) (2 males); Galt, Sacramento Co., July 27, 1952 (E. I. Schlinger) (1 female); Jenny Lind, Calaveras Co., Oct. 21, 1917 (J. C. Bradley) (1 male, 1 female); 3 mi. w. Norman, Glen Co., Sept. 2-12, 1954, (M. Wasbauer) (5 females, 1 male), June 25, 1954 (M. Wasbauer) (1 female); Cottonwood Creek, Mono Co., July 14, 1953 (J. W. MacSwain) (1 female, on Ranunculus californicus); Biggs, Butte Co., June 12, 1954 (M. Wasbauer) (1 female); San Antonio R. S., Santa Clara Co., June 27, 1953 (R. O. Schuster) (2 males); Boca, Nevada Co., June 28, 1954 (J. A. Powell) (1 male).

WASHINGTON: Chehalis, Aug. 25, 1911 (1 female); Bellingham, June 17, 1944 (R. D. Shenefelt) (1 male); Angiola, Tulare Co., July 20, 1957 (1 female).

DIAGNOSIS: Members of this species can be distinguished by the completely chagreened character of the tegulae. Additionally, this is the only species of Mimumesa in which many individuals show a red coloration on the anterior two or three abdominal segments.

DISCUSSION. M. clypeata exhibits two distinct color forms. While the majority of specimens have red on at least the first two abdominal segments (excluding the petiole), nearly one-quarter of the specimens I have examined have a relatively dark abdomen. Because of the commonly red abdomen and completely chagreened tegulae, two characteristics not shared by any other species within the genus, I consider clypeata a rather aberrent species of Mimumesa and one which has no apparently close relationship with any other nearctic form of the genus.

BIOLOGY. Nothing is known on the nesting habits or prey records of this species. Adults are found from May to October in various locales, and have been reported as visiting flowers of Solidago sp., Ranunculus californicus and Apium graveolens.

Mimumesa propinqua (Kincaid) n. comb.

Mimesa propinqua Kincaid 1900:508 (male)
Psen (Mimumesa) propinqua, Malloch 1933:21 (female)
Mimesa (Mimumesa) propinqua, Krombein 1951:961

DESCRIPTION. Female 7.5 mm., forewing 5.3 mm. long. Black; tegulae entirely and tarsi partly amber. Wings hyaline, stigma and veins amber. Vestiture silvery, dense and decumbent on clypeus and lower frons, much longer, more erect and sparser elsewhere, moderately decumbent on thoracic sternites

and abdomen.

Head. Shining above; clypeus and lower frons finely granulate; clypeus approximately three times as broad as long and considerably wider than narrowest distance between compound eyes, apex moderately bidentate; longitudinal median carina present, more pronounced ventrally, arising from a very small, impunctate, tumid area between bases of antennae and extending to median ocellus; transverse facial carinae wanting; upper frons mostly chagreened between antennal bases, striato-punctate below ocelli, punctate lateral of ocelli and moderately punctate above; distance from compound eye to lateral ocellus at most one and one-half times distance between lateral ocelli; furrow connecting lateral ocelli behind weakly evident, post-ocellar tumid area absent; gena at most only finely punctate, never striate; occipital carina complete to its juncture with hypostomal carina; antenna with first flagellar segment about as long as scape and approximately three-quarters length of flagellar segments two and three combined.

Thorax. Shiny; mesoscutum punctate to extensively striato-punctate medially, and closely striate along posterior margin, with well-defined, medio-longitudinal furrow along entire length; medial notaulices distinct, forming lateral borders of furrow anteriorly; mesoscutellum glossy, nearly impunctate on anterior half, faintly striate on posterior

half; postscutellum appearing irregularly granulate to chagreened; mesopleuron mostly chagreened throughout, more finely so on anepisternum; propodeum with dorsal area glossy, traversed by longitudinally parallel striations, median portion broad, lateral carinae distinct, somewhat elevated, evanescent anterio-laterally, enclosure narrow and deep, distinctly reflexed from dorsal area, lateral spheres mostly rugose-reticulate, striate on extreme lateral areas; tegulae shiny and impunctate on anterior portions.

Abdomen. Petiole shiny, slightly longer than hind femur, dorsum with an elongate V-shaped elevation, not sulcate within; pygidium mostly shiny, broad, chagreened, with many deep piliferous punctations, denser apically.

Male. Length 7 mm., forewing 5 mm. long. Much like female but with clypeus more obtusely bidentate; antenna with tyloides linear to oblong on flagellar segments two to ten; mesoscutum punctate, not noticeably striato-punctate, lacking a noticeable dorsal, medio-longitudinal furrow.

TYPES. Holotype, male, Fox Point, Alaska, July 28 (U. S. National Museum, No. 5314); allotype, not designated.

DISTRIBUTION. ALASKA

MATERIAL EXAMINED. Alaska; Fairbanks, June 30-July 3, 1921 (J. M. Aldrich) (1 female, 1 male).

DIAGNOSIS. Both sexes of propinqua can be readily distinguished by the uniformly dark antennae and the partially smooth and glossy tegulae.

DISCUSSION. M. propinqua belongs to the "clypeata" group because of broad, densely piliferous pygidium of the female.

BIOLOGY. Unknown.

Mimumesa mellipes (Say)

Psen mellipes Say 1837:369 (female); Fox 1898:8 (male)
Psen (Mimumesa) mellipes, Malloch 1933:22
Mimesa (Mimumesa) mellipes, Krombein 1951:961
Psen chalcifrons Packard 1867:401-402 (female); Fox 1898:13
Psen (Mimumesa) chalcifrons, Malloch 1933:25
Mimesa (Mimumesa) chalcifrons, Krombein 1951:961 (synonymy)

DESCRIPTION. Female. Average length 7 mm., forewing 5 mm. long. Black; tarsi, fore tibiae, variable parts of meso tibiae, tegulae, broadly on underside of antennal flagellar segments, yellow. Wings hyaline, stigma dark brown, veins mostly amber. Vestiture silvery, dense and decumbent on lower frons and clypeus, much sparser and generally erect elsewhere on body.

Head. Shining above, clypeus and lower frons granular to densely chagreened; clypeus more than twice as long and slightly wider than narrowest distance between compound eyes; apex broadly truncate; longitudinal median carina present,

not pronounced, arising anteriorly from a non-tumid area between the bases of the antennae, extending upward to median ocellus; transverse facial carinae absent; upper frons closely punctate and heavily chagreened, not striate in ocellar area; distance from compound eye to lateral ocellus a little less than one and one-half times distance between lateral ocelli; vertex sparsely or moderately punctate, never striate; gena at most only finely punctate, never striate; occipital carinae complete to juncture with hypostomal carinae; antennae with first flagellar segment longer than scape and approximately two-thirds combined length of flagellar segments two and three.

Thorax. Shiny; mesoscutum moderately punctate, rarely striato-punctate except along posterior margins; notaulices distinct anteriorly; mesoscutellum similar; postscutellum mostly granular; mesopleuron with katepisternum commonly finely striate to chagreened throughout, anepisternum smooth, glossy and impunctate; propodeum with dorsal area glossy, traversed by longitudinally parallel striations, mesal triangular area elongate, narrow, lateral striations meeting lateral carinae generally near anterior portion of the enclosure; enclosure narrow, well-defined, lateral spheres rugose-reticulate with extreme lateral areas finely striate and chagreened; tegulae shiny and impunctate on anterior portions.

Abdomen. Petiole shiny, equal in length to hind femur, dorsal surface not carinate, at most with well-developed longitudinal medial convexity only rarely sulcate within; pygidium broad, with large punctations, distinctly chagreened, generally obscured at least apically by dense decumbent hairs.

Male. Length averaging 6.5 mm., forewing 5 mm. long. Black, tarsi, fore and mid-tibiae, frequently portions of hind tibiae, tibio-femoral joints, tegulae, and undersides of all antennal flagellar segments except last one, yellow; femora, trochanters and coxae varying from black to reddish brown. Head much as in female with following exceptions: Clypeal apex generally indentate; antennae with highly elevated tyloides appearing on flagellar segments four to six. Abdomen with petiole variable on dorsal surface, commonly dorsal surface roughened and with irregular carinate-like lines.

TYPES. Of mellipes: holotype, female, "Indiana" (Say) (no types of mellipes are now known to exist). Of chalcifrons: holotype, female, "Illinois" (Philadelphia Academy of Sciences); allotype of chalcifrons, not designated.

DISTRIBUTION. Northeastern United States west to the Dakotas and south-central Canada.

MATERIAL EXAMINED: NORTH DAKOTA: Tower Cy., June 28 and July 6, 1906 (M. W. R.) (1 female, 1 male).

SOUTH DAKOTA: Madison, June 14, 1928 (H. C. Severin) (1 male).

MINNESOTA: Glenville, Aug. 5, 1921 (P. S. Keene) (1 female); near Henderson, Sibley Co., July 17, 1922 (Wm. E. Hoffman) (1 male); Rock Co., Aug. 16, 1936 (C. E. Mickel) (1 male); Ramsey Co., June 28, 1936 (F. C. Fisk) (1 male).

IOWA: Ames, Aug. 4, 1927 (1 male).

ILLINOIS: Champaign (M. W. Shackleford) (1 female, 11 male).

DIAGNOSIS. The males of mellipes can be immediately distinguished by the extremely well-elevated antennal tyloides occurring on flagellar segments four to six, and the contrastingly darkened last antennal segment. The female, however, is not as readily distinguishable but may be characterized by the broadly truncate condition of the apex of the clypeus, yellow coloration on all or part of the fore tibiae, lack of striations on the vertex and gena, generally sparsely punctate condition of the upper frons and absence of puncto-striations on the mesoscutum.

DISCUSSION. M. mellipes, like canadensis and propinqua, belongs to the "clypeata" group, the females of which possess a very broad, deeply punctate pygidium readily distinguishing them from the "mixta" group wherein the pygidium is narrow and only sparsely punctate.

I have examined the holotype of chalcifrons and have found that it closely resembles mellipes. There is, however, some variation in the dorsal surface of the propodeum of chalcifrons in reference to the larger mesal area which differs somewhat from the usual condition found in mellipes. I believe, however, that this is a type of variation which can be expected to occur in species with an extended range. The type of chalcifrons itself does not completely agree with Packard's description, especially in reference to the color of the legs and punctation of the mesoscutum. The type specimen has punctations widely scattered with some fine striations restricted to the median portion of the mesoscutum, and the legs are black with the tarsi, fore tibiae and undersides of meso tibiae largely yellow.

Mimumesa canadensis (Malloch) n. comb.

Psen (Mimumesa) canadensis Malloch 1933:22-23 (male and female)
Mimesa (Mimumesa) canadensis, Krombein 1951:961

DESCRIPTION. Female. Average length 7 mm., forewing 5 mm. long. Black; tegulae, undersides of antennal flagellar segments two to ten, commonly fore and mid tarsi, less frequently hind tarsi, yellow. Wings hyaline, stigma dark brown, veins light to dark amber, lighter basally. Vestiture silvery, dense and decumbent on frons and clypeus, sparser and erect

elsewhere.

Head. Moderately shiny above; clypeus and lower frons granular to densely chagreened; clypeus more than twice as broad as long and considerably wider than the narrowest distance between compound eyes; apex broadly emarginate (variable); longitudinal median carinae complete, not pronounced, not arising anteriorly from a tumid area; transverse facial carinae absent; upper frons distinctly striato-punctate; vertex commonly striate; distance from compound eye to lateral ocellus only slightly greater than distance between lateral ocelli; gena commonly striate, punctate in some extra-limital forms; occipital carina complete to juncture with hypostomal carina; antennae with first flagellar segment longer than scape and nearly equal to length of flagellar segments two and three.

Thorax. Shiny; mesoscutum largely punctate to striato-punctate, striato-punctate to striate posteriorly; notaulices distinct anteriorly; mesoscutellum glossy, at most sparsely punctate anteriorly, more densely punctate posteriorly; postscutellum granular; mesopleuron with anepisternum glossy and nearly impunctate, katepisternum commonly striate along anterior and posterior margins, sparsely punctate medially; propodeum with dorsal area glossy, interrupted by longitudinally parallel striations, central portion considerably larger than in mellipes with lateral striations meeting lateral

carinae some distance laterad of enclosure, enclosure normal, lateral spheres rugose-reticulate, extreme lateral areas finely striate and chagreened; tegulae shiny and impunctate on anterior portions.

Abdomen. Petiole generally shiny, slightly longer than length of hind femur, dorsum with two indistinct, generally posteriorly converging carinae, forming a commonly shallow, medial sulcate area anteriorly, broadly convex posteriorly, pygidium as in mellipes.

Male. Average length 6.5 mm., forewing 4.5 mm. long. Color and structural features much as in female but with clypeal apex much less edentate; gena generally less striate than in female; underside of flagellum frequently darker, particularly on middle segments, linear tyloides distinct at or near color interfaces on flagellar segments two to six.

TYPES. Holotype, male, "Canada" (C. F. Baker) (U. S. National Museum, No. 2416); allotype, female, "Canada" (C. F. Baker) (U. S. National Museum, No. 2021).

DISTRIBUTION. Northern United States and southern Canada, east of the Rocky Mountains.

MATERIAL EXAMINED. NEW YORK: Port Ontario, June 27, 1955 (H. E. Evans) (1 female); Axton, June 12, 1901 (A. D. MacG. & C. O. H.) (3 males).

NEW JERSEY: Sandy Hook, June 30, 1910 (1 female).

NORTH DAKOTA: Tower Canyon, June 14-July 12, 1906 (M. W. R.) (1 female, 3 males).

WYOMING: Riverton, July 11, 1955 (G. E. Bohart) (1 female).

MINNESOTA: Marshall Co., June 19, 1928 (C. E. Mickel) (1 female), Aug. 4, 1936 (D. G. Denning) (1 female); Pine River, Aug. 18, 1935 (A. B. Gurney & R. H. Daggy) (1 female, 2 males); Kittson Co., July 22, 1936 (D. G. Denning) (1 female, 1 male); Ramsey Co., July 8, 1922 (H. H. Knight) (1 female); LaSueur, July 17, 1922 (W. E. Hoffman) (1 male); Ada, July 6, 1911 (D. Stoner) (1 male); Polk Co., Aug. 16, 1924 (W. Carter) (1 male).

MICHIGAN: Mackinac Co., Aug. 30, 1959 (R. & K. Dreisbach) (1 female); Detroit, July 8, 1922 (C. E. Mickel) (1 male), Sept. 5, 1938 (Geo. Steyskal) (1 female, 1 male); Delta Co., July 3, 1955 (R. R. Dreisbach) (1 female); Ontonagon Co., June 28, 1955 (R. S. Dreisbach) (1 female); Ogemaw Co., Aug. 1, 1959 (R. R. Dreisbach) (1 male); Marion Island, Grand Traverse Co., July 25, 1923 (T. H. Hubbell) (1 male); Thumb Lake, Charlevoix Co., July 19, 1923 (T. H. Hubbell) (1 male); Midland Co., July 26, 1958 (R. R. Dreisbach) (1 male).

SASKATCHEWAN: 5 mi. e. Swift Current, June 22, 1959 (A. R. Gittins) (1 male); "?" (C. F. Baker) (1 female, 1 male).

DIAGNOSIS. This species is similar in general character to mellipes, distinguished in the male by the color and structure of the antennal tyloides. In canadensis the tyloides are moderately elevated on segments two through six and are of light coloration, while in mellipes the tyloides are highly elevated and distinctly darkened. Females of canadensis may be distinguished from females of mellipes by the coloration of the fore tibia and the punctation of the head. In canadensis the fore tibia is uniformly dark and the gena and vertex usually striate, while in mellipes the fore tibia is partly to entirely yellow and the gena and vertex are punctate.

DISCUSSION. M. canadensis is more closely related to mellipes than to any other species of Mimumesa. Both species occur sympatrically throughout most of their ranges with canadensis apparently extending further north. The petiole of both species has the dorsal median carinae poorly developed and at most only weakly sulcate anteriorly. The shape and punctational nature of the pygidium in the females places both species in the "clypeata" group along with clypeata and propinqua from which they can be immediately distinguished by the broadly yellow coloration of the underside of the antennal flagellum. This antennal character can also be used to differentiate the males of canadensis and mellipes from the other species of the "clypeata" group.

The listing of Alaska under distribution data in the Hymenopterous catalogue by Krombein is deemed questionable.

BIOLOGY. Nothing is known of the habits and prey of this species.

Mimumesa cylindrica (Fox) n. comb.

Psen cylindricus Fox 1898:5 (male and female); Krombein 1951:961

DESCRIPTION. Female. Length averaging 7.5 mm., forewing 4.8 mm. long. Black; fore tarsi, apices and undersides of mid and hind tarsi, tegulae, and undersides of flagellar segments two to ten reddish-brown. Wings hyaline, stigma and veins deep brown. Vestiture silvery, dense and decumbent on clypeus and lower frons, sparser and generally erect elsewhere.

Head. Shiny; clypeus and lower frons chagreened to finely granular; clypeus more than twice as broad as long and wider than narrowest distance between compound eyes, apex obtusely bidentate medially; longitudinal median carina distinct, arising from a tumid area between antennal bases, less pronounced near median ocellus; transverse facial carinae present; upper frons striato-punctate above antennae, deeply punctate laterally and sparsely punctate dorso-laterally; vertex striate at least along medial posterior portion,

strongly striate laterally; distance from compound eye to lateral ocellus about one and one-half times distance between lateral ocelli; lateral ocelli connected behind by a strong furrow posterior of which is a broad, glossy, tumid area; gena striate at least along posterior part; occipital carina complete to juncture with hypostomal carina; antennae with first flagellar segment longer than scape but distinctly less than two-thirds combined length of flagellar segments two and three.

Thorax. Shiny; mesoscutum deeply and generally closely punctate; notaulices distinct anteriorly; mesoscutellum with deep but widely scattered punctations, nearly impunctate anteriorly; postscutellum largely granular; mesopleuron with both anepisternum and katepisternum striate to striato-punctate throughout; propodeum with dorsal area broad, moderately shiny, traversed laterally by longitudinal, parallel carinae, medially by a few irregular transverse carinae, lateral carinae complete, not highly elevated, enclosure short and deep, lateral spheres moderately rugose-reticulate and heavily chagreened, with extreme lateral areas finely striate; tegulae shiny and impunctate on anterior portions.

Abdomen. Petiole shiny, slightly longer than hind femur, dorsal surface with two longitudinal, posteriorly converging carinae, sulcate within for much of length (sulcate only anteriorly in some forms); pygidium moderately narrow, only

sparingly pubescent and with a few punctations becoming denser toward apex, smooth, shiny, nearly impunctate basally.

Male. Not seen.

TYPES. Holotype, female, "Arizona" (Philadelphia Academy of Sciences); allotype, male, "Arizona" (Philadelphia Academy of Sciences).

DISTRIBUTION. Southeastern Arizona.

MATERIAL EXAMINED. ARIZONA: Rustler's Park, Chiricahua Mtns., Aug. 6, 1958 (G. B. Pitman) (1 female); Mt. Lemmon Lodge, S. Catalina Mtns., Aug. 15, 1954 (R. M. Rohart) (1 female).

DIAGNOSIS. Males and females of cylindrica can be readily distinguished from all other species of Mimumesa by the characteristic ornamentation of the meso-anepisternum. In cylindrica, this sclerite is traversed by a series of striations. All other species of the genus have the meso-anepisternum glossy and nearly to entirely impunctate.

DISCUSSION. This interesting species was described by Fox in 1898 from a single pair of specimens. The relative scarcity of the species is readily attested to by the fact that no collection records have been published on the species since the original description. Malloch apparently saw no specimens

of cylindrica during his study of the psenine wasps, and completely ignored this species in his revision. It was, however, listed by Krombein in the Hymenoptera catalogue.

BIOLOGY. Unknown; at present it appears to be a mountain dwelling form.

Mimumesa longicornis (Fox) n. comb.

Psen longicornis Fox 1898:8 (male)
Mimesa longicornis, Viereck 1901:340
Psen (Mimumesa) longicornis, Malloch 1933:23 (female)
Mimesa (Mimumesa) longicornis, Krombein 1951:961
Mimesa striatus Viereck 1901:339 (female)
Psen (Mimumesa) striatus, Malloch 1933:23 (male)
Mimesa (Mimumesa) striatus, Krombein 1951:961 (synonymy)
Psen floridana Rohwer 1910:102 (female)
Psen (Mimumesa) floridana, Malloch 1933:23 (synonymy)

DESCRIPTION. Female. Length averaging near 7 mm., forewing near 5 mm. Black; variable degrees of yellow to reddish-brown on legs, antennae, tegulae, lateral angles of pronotum, abdominal tergites, and occasionally a reddish tinge extending to the petiole and propodeum. Wings hyaline, stigma brown, veins amber. Vestiture silvery, often highly glistening, dense and decumbent on clypeus and lower frons, sparser and erect elsewhere.

Head. Shining above; clypeus and lower frons granular to chagreened; clypeus nearly three times as broad as long and distinctly wider than narrowest distance between compound eyes;

apex with two well-developed medio-lateral teeth, truncate to slightly emarginate between; longitudinal median carina present, arising from a tumid area between antennal bases and extending upward to median ocellus, upper half of carina much less pronounced; transverse facial carinae usually absent, when present, extending out from base of longitudinal carina only part way to antennal sutures; upper frons striate medially, mostly punctate and chagreened laterally but becoming transversely striate laterad of lateral ocelli; vertex striate and punctate; distance from compound eye to lateral ocellus nearly twice the distance between the lateral ocelli; furrow connecting lateral ocelli behind present, but nearly interrupted medially by a weak, broadly tumid area; gena nearly smooth and glossy, finely chagreened, never striate; occipital carina complete to juncture with hypostomal carina; antenna with first flagellar segment slightly longer than scape, approximately three-quarters the length of flagellar segments two and three combined.

Thorax. Shiny; mesoscutum deeply striate; notaulices distinct anteriorly; mesoscutellum glossy, sparsely punctate; postscutellum granular; mesoplueron with anepisternum glossy and at most sparingly punctate, katepisternum commonly finely striate to reticulate particularly on upper portion; propodeum with dorsal area shiny, traversed by longitudinally

parallel striations, mesal area wide, lateral carinae complete, not highly elevated, enclosure narrow, elongate, lateral spheres rugose-reticulate with chagreening, extreme lateral areas striate and chagreened; tegulae shiny and impunctate anteriorly.

Abdomen. Petiole shiny, slightly longer than hind femur; dorsal surface with two well-developed posteriorly converging longitudinal carinae, pronouncedly sulcate between; pygidium about one-half width of last abdominal tergite basally, sparingly pubescent, considerably chagreened, deeply but sparsely punctate.

Male. Length averaging near 6.7 mm., forewing 5 mm. long. Color and vestiture much as in female. Head as in female, but clypeal apex nearly truncate, lateral teeth broad and short; antenna with flagellar segments two to ten (occasionally two to nine) with distinct linear tyloides, much broader on segments seven and eight, often papillae-like on segment ten. Thoracic and abdominal characters as in female but pygidium absent.

TYPES. Of longicornis: holotype, male, "Florida" (A. T. Slosson) (Philadelphia Academy of Sciences); allotype, not designated. Of striatus: holotype, Westville, New Jersey, Aug. 30, 1899 (H. L. Viereck) (Philadelphia Academy of Sciences); allotype, not designated. Of floridana: holotype,

female, Biscayne Bay, Florida (U. S. National Museum, No. 12360); allotype, not designated.

DISTRIBUTION. Southern and eastern United States west to Louisiana and Minnesota; California.

MATERIAL EXAMINED. FLORIDA: "Florida" (A. T. Slosson) (1 female); Biscayne Bay (2 males); Kissimmee Prairie, Aug. 25, 1931 (Bradley and Knorr) (1 female); Ormond, (A. T. Slosson) (1 male); Olga, Lee Co., March 29, 1954 (C. M. Yoshimoto) (1 male); Tallahassee, April 1, 1944 (R. & G. Bohart) (1 male).

LOUISIANA: Sulphur, May 6, 1958 (Evans & Flint) (1 female); Tallulah (1 female).

GEORGIA: Kingsland, Sept. 9, 1931 (Bradley & Knorr) (1 male).

NORTH CAROLINA: New River, April-May, 1942 (G. E. Bohart) (3 males).

ILLINOIS: Centerville, Aug. 6, 1914 (M. A. Cazier) (1 male).

MINNESOTA: St. Peter, July 30, 1922 (Wm. E. Hoffmann) (2 females); Lesueur Co., July 17, 1923 (Sam Kepperley) (1 female).

NEW JERSEY: Brigantine, Sept. 9, 1927 (C. H. Ballov) (1 male).

NEW YORK: Ithaca, July 16, 1896 (1 male); Astoria,

Aug. 8, 1893 (T. Pergrande) (1 male).

MAINE: Casco, Aug. 8, 1944 (J. C. Bradley) (1 female).

CALIFORNIA: Biggs, Butte Co., June 12, 1954 (M. Wasbauer) (1 female); Benicial, Aug. 14, 1910 (J. C. Bridwell) (1 female); Woodland, Sept., 1953 (A. T. McClay) (1 male).

DIAGNOSIS: Both sexes of this species can be readily distinguished from other members of the genus Mimumesa by the extremely striate condition of the mesoscutum, by the striate character of the frons between the antennal bases and the median ocellus, and generally by the finely striate to reticulate character of the meso-katepisternum.

DISCUSSION. This species is unusual in that it exhibits great variation in coloration but remarkable uniformity of structural features including the male genitalia. That there may be as many as three sibling species involved cannot be completely overlooked, particularly in view of the discontinuous distribution. A complete understanding of the status of this particular species must await the gaining of biological information which may then possibly be used in classification.

Viereck apparently did not recognize the possibility of color variation in longicornis when he described striatus in 1901. At that time he assigned a second specimen taken by him at the same time and place as the striatus holotype to

the species longicornis because of that specimen's coloration. Malloch supported Viereck in his recognition of these two species, but utilized "rather minute characters" in differentiating striatus from longicornis. I, and apparently Krombein (1951), noted that integration of these "minute characters" can occur within longicornis and we both consider striatus as a synonym. Malloch (1933) examined Rohwer's type of floridana and could find no stable differences between it and longicornis and so assigned the former to synonymy. My examination of the floridana type leads to the same conclusion.

BIOLOGY. Not known.

Mimumesa mixta (Fox) n. comb.

Psen mixta Fox 1898:7 (male and female)
Mimesa mixta, Viereck 1901:342
Psen (Mimumesa) mixta, Malloch 1933:21
Mimesa (Mimumesa) mixta, Krombein 1951:961
Psen alticola Viereck 1903:66 (female); Malloch 1933:21 (synonymy)
Psen similis Rohwer 1910:101 (male); Malloch 1933:21 (synonymy)

DESCRIPTION. Female. Average length near 8.5 mm., forewing 6 mm. long. Black; undersides of tarsi nearly entirely yellow; tegulae, occasionally variable portions of antennae, much of legs, reddish. Wings hyaline, veins and stigma dark brown. Vestiture silvery, decumbent and more dense on clypeus

and lower frons than elsewhere.

Head. Moderately shiny above; clypeus and lower frons mostly finely punctate; clypeus nearly three times as broad as long and distinctly wider than narrowest distance between compound eyes, apex obtusely bidentate, commonly with lateral angulations; longitudinal median carina complete, arising from a well-developed tumid area and extending upward to median ocellus; transverse facial carinae present, not pronounced; upper frons striato-punctate below ocellar area, heavily and deeply punctate lateral of ocellar area; distance from lateral ocellus to compound eye more than one and one-half times the distance between lateral ocelli; postocellar furrow connecting lateral ocelli present, anteriorly margining a broad, weakly tumid area; vertex striato-punctate to striate; gena deeply striate; occipital carina complete to juncture with hypostomal carina; antenna with first flagellar segment approximately equal in length to scape and about two-thirds length of flagellar segments two and three combined.

Thorax. Moderately shiny; mesoscutum deeply punctate with punctations separated by more than punctation diameter, partly striate along posterior margin; notaulices distinct; mesoscutellum more sparsely and finely punctate than mesoscutum; postscutellum variable, commonly shiny, finely punctate but with surface irregularities, particularly laterally;

mesopleuron with anepisternum glossy, at most with only fine sparse punctations, katepisternum variable, glossy, finely punctate and striate, striations commonly confined to anterior and posterior margins; propodeum with dorsal area glossy, traversed by longitudinal, parallel striations frequently contiguous with striations on anterior portions of the lateral spheres, median portion broad, lateral carinae present, not highly elevated, commonly nearly evanescent along anteriolateral portion, enclosure narrow, lateral spheres mostly striate and chagreened anteriorly, rugose-reticulate medially, extreme lateral areas striate; tegulae shiny, impunctate anteriorly.

Abdomen. Petiole shiny, equal in length to hind femur, dorsal surface with two posteriorly converging longitudinal carinae frequently forming a mesally sulcate area (sulcate condition highly variable, well-developed in holotype); pygidium narrow, mostly chagreened, sparingly pubescent, with few to moderate numbers of deep punctations.

Male. Averaging 7 mm. long, forewing near 5 mm. Similar to female but with clypeal apex more narrowly edentate; gena occasionally only finely striate with striations confined to upper portion; antenna with tyloides ovate, confined to flagellar segments seven and eight, infrequently with narrow, incomplete lineations on flagellar segments two to six.

TYPES. Of mixta: holotype, female, Moscow, Idaho (J. M. Aldrich) (Philadelphia Academy of Sciences); allotype, not designated. Of alticola: holotype, female, Beulah, New Mexico, Aug. 17, 1901 (H. Skinner) (Philadelphia Academy of Sciences); allotype, not designated. Of similis: holotype, male, Florissant, Colorado, July 17, 1907 (S. A. Rohwer) (U. S. National Museum); allotype, not designated.

DISTRIBUTION. Western North America; California to British Columbia, east to New Mexico, Colorado and Alberta.

MATERIAL EXAMINED. CALIFORNIA: Leland Mdw., Tuolumne Co., July 16, 1957 (J. W. MacSwain) (3 males, 5 females), Aug. 3-5, 1960 (A. S. Menke) (1 female, 1 male); Dardanelles, Tuolumne Co., June 26, 1951 (C. A. Downing) (1 female); Strawberry, Tuolumne Co., June 18-21, 1951 (E. G. Linsley & J. W. MacSwain) (1 female, 1 male), July 7, 1957 (John W. Burns) (1 male), June 19-20, 1951 (J. W. MacSwain) (2 females), June 15, 1957 (D. J. Burdick) (1 female), June 23, 1951 (S. M. Kappos) (1 female), July 6, 1958 (L. E. Campos) (1 male); Dodge Ridge, Tuolumne Co., Aug. 17, 1960 (A. S. Menke) (1 female); Bowerman Mdw., Trinity Co., June 3, 1951 (A. T. McClay) (1 male); 10 mi. n. Coffee Cr., R. S., Trinity Co., July 15, 1955 (J. W. MacSwain) (1 male); Trinity R. Camp, Trinity Co., July 17-18, 1953 (A. T. Mc Clay) (2 males); E. Fork, Trinity River, Trinity Co.,

July 13, 1955 (R. M. Bohart) (1 female); Trinity Co., June 13, 1934 (1 male); Arroyo Seco Camp, Monterey Co., May 1, 1960 (P. E. Paige) (2 males), June 5-July 5, 1958 (R. M. Bohart) (1 male, 1 female), June 6, 1956 (R. M. Bohart) (1 female), June 5, 1956 (R. C. Bechtel) (1 female), May 11, 1958 (A. S. Menke) (1 male), May 1, 1960 (F. D. Parker) (1 male); Mill Potrero, Kern Co., July 8, 1959 (R. M. Bohart) (2 males); July 22, 1957 (R. M. Bohart) (1 female), Aug. 8, 1958 (R. M. Bohart) (1 female); G. Alpine Cr., Tahoe, July 7, 1915 (E. P. VanDuzen) (2 females); Motate Point, Contra Costa Co., May 15, 1958 (A. D. Telford) (6 males); Independence Lake, Sierra Co., July 16, 1958 (R. M. Bohart) (1 female); Sierraville, Sierra Co., July 24, 1956 (R. M. Bohart) (2 males, 2 females); Weber Lake, Sierra Co., Aug. 5, 1951 (E. I. Schlinger) (1 female), Aug. 4, 1951 (E. I. Schlinger) (1 female), Aug. 4, 1951 (R. C. Bechtel) (1 male), July 30, 1951 (E. A. Kurts) (1 male); Sardine Lakes, Sierra Co., July 31, 1958 (A. A. Grigarick) (2 females); Samuel Spr., Napa Co., May 9, 1955 (R. M. Bohart) (1 male), May 16, 1954 (R. M. Bohart) (1 female), May 18, 1945 (E. I. Schlinger) (1 female), May 30, 1958 (R. C. Bechtel) (1 female), May 30, 1953 (E. I. Schlinger) (1 female); 4 mi. w. Quincy, Plumas Co., July 3, 1949 (F. Morishita) (1 male), July 5, 1952 (E. I. Schlinger) (1 male), July 4, 1951 (E. I. Schlinger) (1 female); Onion Valley, Plumas Co., Aug. 23, 1952 (R. C.

Bechtel) (1 female); Buck's Lake, Plumas Co., July 14, 1949 (P. D. Hurd) (1 female), July 1, 1949 (J. W. MacSwain) (1 female, June 24 (P. D. Hurd) (1 female); Carson Pass, 8,000 feet, Sept. 2, 1934 (1 male); Hallelujah Jct., Lassen Co., July 4, 1949 (J. W. MacSwain) (1 male); Bridge Cr. Cmp., Lassen Co., July 9, 1949 (J. E. Gillaspy, J. W. MacSwain) (2 females); Norvel, Lassen Co., Aug. 12, 1954 (R. C. Bechtel) (1 female); Bakersfield, May 19, 1935 (R. M. & G. E. Bohart) (1 female); Oakland, June 12, 1933 (1 female); Tahquitz Valley, San Jacinto Mtns., July 17, 1912 (J. C. Bridwell) (1 female); Marion Mt. Camp, San Jacinto Mtns., July 1, 1952 (H. I. Mathis) (1 female); Ribbonwood, San Jacinto Mtns., May 20, 1939 (E. S. Ross) (1 female); Moose Camp, Shasta Co., July 14, 1955 (E. I. Schlinger, J. C. Downey) (2 females), July 6, 1953 (A. A. Grigarick) (1 male); Hat Creek P. O., Shasta Co., July 2, 1955 (J. R. Jessen) (1 female), June 23, 1955 (A. J. Mueller) (1 male); Lake Britton, Shasta Co., June 29, 1947 (T. F. Leigh) (1 male); Old Station, Shasta Co., Aug. 16, 1952 (R. C. Bechtel) (1 female), June 24, 1955 (A. J. Mueller) (1 male), June 22, 1955 (J. W. MacSwain) (1 male), July 22, 1955 (J. W. MacSwain) (1 male); Summit Lake, Shasta Co., July 11, 1947 (T. F. Leigh) (1 male); Snow Mt. Rd., Shasta Co., July 14, 1955 (J. C. Downey, E. I. Schlinger) (1 male, 1 female); Merced Co., May 30, 1959 (F. D. Parker) (1 female); Arroyo Mocho, Alameda Co., May 24, 1957 (J. Powell)

(1 female); Angora Peak, July 19, 1931 (E. O. Essig) (1 female); Deer Creek, Tahoma, June 6, 1949 (R. M. Bohart) (1 female); San Mateo Co., June 30, 1935 (1 female); Lemoncove, Tulare Co., June 14, 1950 (J. W. MacSwain) (1 female); Dutch Flat, Placer Co., June 10, 1956 (R. M. Bohart) (1 male); Brockway Summit, Placer Co., July 25, 1957 (R. M. Bohart) (2 females), July 1, 1941 (G. E. Bohart) (1 female); Somesbar, Siskiyou Co., July 8, 1958 (J. Powell) (1 female); Kettleman Plns., Fresno Co., June 4, 1907 (J. C. Bradley) (1 female); Lake Co., July 8, 1927 (1 female); Falls Pub. Cp., San Bernadino Mtns., July 11, 1956 (R. M. Bohart) (1 female, 1 male); Yosemite, May 15, 1931 (1 female); Putah Cyn., Yo-Solano Co., May 1, 1940 (G. E. Bohart) (1 female); Alum Rock Pk., Santa Clara Co., May 25, 1950 (J. W. MacSwain) (1 female); Elkhorn Ferry, Yolo Co., July 28, 1953 (R. C. Bechtel) (1 female); Echo Lake, El Dorado Co., July 14, 1956 (W. W. Middlekauff) (1 female); Big Pine Cr., Inyo Co., June 20, 1942 (R. M. Bohart) (1 female); east side Mt. Diablo, May 21, 1954 (R. M. Bohart) (1 female); Blanco's Corral, White Mtn., Mono Co., July 7-23, 1953 (J. W. MacSwain) (4 males), July 16, 1953 (R. M. Bohart) (2 males); Folsum, May 12, 1953 (A. D. Telford) (1 male); Crystal Lake, Los Angeles Co., June 28, 1956 (R. M. Bohart) (1 male); Berkeley, June 1934 (1 male); "Mokel Hill" (1 male); Blue Lake, Humboldt Co., June 20, 1927 (1 male); Willow Creek, Humboldt Co., May 28, 1955 (J. C. Downey)

(1 male); Little Grayback Pass, Del Norte Co., July 9, 1958 (J. Powell) (1 male); Felton, St. Cruz Mtns., May 20-25, 1907 (J. C. Bradley) (1 male); Chico, June 7, 1954 (M. Wasbauer) (1 male); Glen Ellen, Sonoma Co., June 9, 1951 (E. I. Schlinger) (1 male).

WASHINGTON: Seattle, July 6-27, 1898 (10 males, 4 females), June 20, 1902 (1 male), Aug. 27-29, 1899 (2 males), May 15, 1898 (1 male), June 20, 1901 (1 male), May 31, 1914 (1 male), May 30, 1911 (B. R. Elliott) (1 male), Aug. 31, 1916 (1 male), June 10, 1897 (1 male), May 18-30, 1897 (1 male, 1 female), July 26, 1895 (1 female), June 25, 1930 (J. M. Aldrich) (1 male); Orcus I., July 14-30, 1909 (W. M. Mann) (2 males, 1 female); Pullman, Aug. 16, 1907 (A. L. Melander) (1 male); Olympia, May 28, 1894 (1 male), June 17, 1894 (1 male, 1 female), June 29, 1896 (1 male), July 6-7, 1896 (2 females), June 17-20, 1897 (2 females); Medical Lake, July 14, 1920 (R. C. Shannon) (1 male); Chehalis (1 female); Whidby Is. (1 female); Pt. Blakely, July 2, 1898 (1 female); Friday Harbor, July 10, 1901 (1 female); Sea View, July 20, 1925 (A. Spuler) (1 female); Ft. Lewis, June 24, 1951 (H. F. Robinson) (1 female); Walla Walla, June 2, 1936 (G. E. Bohart) (1 female); Marietta, Whatcom Co., July 18, 1944 (R. D. Sheneflet) (1 male); Coupeville, Aug. 13 (2 males); July 20, 1893 (T. Kincaid) (1 male).

OREGON: Corvallis, Sept. 14-15, 1907 (J. C. Bridwell) (3 males, 2 females), July 23, 1907 (J. C. Bridwell) (1 female), June 8-20, 1898 (1 male, 1 female), May 27, 1939 (H. J. Ostlind) (1 female), June 8, 1898 (1 male), July 17, 1910 (J. C. Bridwell) (1 male), Sept. 6, 1940 (1 male), Sept. 30, 1901 (J. C. Bridwell) (2 males), Aug. 14, 1907 (J. C. Bridwell) (1 male), June 12, 1898 (J. C. Bridwell) (1 male), Aug. 23, 1932 (H. A. Scullen) (1 male); 5 mi. w. Sisters, June 26, 1939 (Gray & Schuh) (1 female, 3 males), July 8, 1939 (Gray & Schuh) (1 male); Siskiyou, Jackson Co., July 17, 1943 (H. A. Scullen) (1 female); Rock Cr., Valley, Benton Co., July 13, 1907 (J. C. Bridwell) (1 male); Dixie Pass, Malheur Nat. For., July 6, 1957 (W. H. Lange) (2 males); Mt. Hood (2 males); 2 mi. w. Paulina Lake, July 26, 1939 (Gray & Schuh) (1 male); Milton, June 22, 1938 (Gray & Schuh) (1 male); Olsen Mt., May 26, 1934 (H. A. Scullen) (1 male); Summit Prairie, July 23, 1939 (Gray & Schuh) (1 male); 20 mi. w. St. Helena, June 21, 1938 (Gray & Schuh) (1 male).

NEVADA: 1 mi. n. Battle Mtn., Lander Co., Aug. 21, 1958 (F. D. Parker) (1 male); Austin Summit, Lander Co., July 3, 1958 (F. D. Parker) (1 female); 16 mi. n. Sand Pass, Washoe Co., Aug. 7, 1957 (R. C. Bechtel) (1 female); 1 mi. s. Mustang, Washoe Co., June 7, 1959 (F. D. Parker) (1 female); Verdi, July 3, 1951 (R. M. Bohart) (1 female).

IDAHO: 7 mi. n. Whitebird, July 7, 1960 (A. R. Gittins) (1 male); Spalding, May 17, 1954 (W. F. Barr) (1 male); Rock Cr. R. S., Minadoka N. F. July 20, 1952 (W. F. Barr) (1 male); McCall, July 31, 1938 (J. W. Zukel) (1 male); Lawyers Cyn., Lewis Co., July 16, 1958 (A. R. Gittins) (1 female); Moscow, Latah Co., May 25, 1961 (A. R. Gittins) (1 female); Parma, Canyon Co., July 28, 1958 (N. D. Waters) (1 female); Twin Falls, Aug. 6, 1954 (A. R. Gittins) (1 female); Bear Creek Pass, July 9, 1947 (R. M. Bohart) (1 female).

NEW MEXICO: Taos Canyon, June 14, 1956 (R. & K. Dreisbach) (1 male); Cimarron Canyon, June 12, 1956 (R. & K. Dreisbach) (1 female).

WYOMING: Gr. Teton N. P., June 20, 1947 (R. M. Bohart) (1 male).

UTAH: Tooele, July 5, 1952 (G. F. Knowlton) (1 female); Cache Co., Aug. 3, 1953 (G. E. Bohart) (1 female).

ALBERTA: Lethbridge, June 14, 1938 (R. W. Salt) (1 male); Medicine Hat, June 23-30, 1940 (J. L. Carr) (2 females).

BRITISH COLUMBIA: Skihist Camp, Fraser River, June 2-21, 1957 (E. I. Schlinger) (2 males); Duncan and Cowichan Lake, Van. Is., Sept. 5, 1914 (J. C. Bradley) (1 male).

DIAGNOSIS. Members of this species are included in the "mixta" group in that the females possess a narrow, only sparsely pubescent pygidium. In this regard, they are most closely

related to leucopus, columbiana and cylindrica. The females of mixta, however, can be readily distinguished from members of the above-named species by the striate condition of the vertex and gena. Males of mixta are distinguished by the striate condition of the vertex, commonly striate condition of the gena, and the form of the antennal tyloides.

DISCUSSION. This species is one of the more common Mimumesa occurring in western North America. Unlike some other species of the genus, mixta displays little variation in structure and color. Some relatively slight variations in the sculpturing of the propodeum and the dorsal surface of petiole, as well as the degree of striation on the gena are evident in the large series of specimens examined. Furthermore, scattered populations of a lighter color-form are found along the coastal regions of the Pacific Northwest.

BIOLOGY. Nothing is known on the biology of this common species.

Mimumesa sodalis new sp.

DESCRIPTION. Male. Length 6 mm., forewing 4 mm. Black; tarsi, apices of tibiae, undersides of fore tibiae, undersides of antennal flagellar segments, yellow; remainder of legs, antennae, distal half of mandibles, and tegulae, amber

to brown. Wings hyaline, stigma and veins amber. Vestiture silvery, dense and decumbent on clypeus and lower frons, less dense and more erect elsewhere though moderately thick on much of thorax.

Head. Glossy, conspicuously convex anterio-dorsally and dorsally; clypeus and lower frons finely punctate; clypeus about twice as broad as long and only slightly broader than narrowest distance between compound eyes, apex weakly bidentate; longitudinal median carina complete to median ocellus, not arising from a distinct tumid area between bases of antennae; transverse facial carinae obscure; upper frons above antennal bases and vertex only sparsely set with fine punctations, never striate or striato-punctate; distance from compound eye to lateral ocellus twice distance between lateral ocelli; post-ocellar furrow present, shallow, connecting lateral ocelli behind; gena glossy, with at most a few fine punctations; occipital carina complete to its juncture with hypostomal carina; antennae with first flagellar segment considerably longer than scape and approximately two-thirds length of flagellar segment two and three combined; antennal tyloides oblong to ovate, distinct on flagellar segments two to eight.

Thorax. Glossy; mesoscutum with only widely scattered fine punctations, notaulices distinct anteriorly; mesoscutellum glossy, punctate, punctations much as on mesoscutum;

postscutellum appearing roughly chagreened, with a distinct medial longitudinal carina; mesopleuron with both anepisternum and katepisternum glossy, at most only finely punctate; propodeum with dorsal area traversed by parallel carinae, middle portion broad, smooth and glossy, lateral carinae present, not highly elevated, becoming obscure anterio-laterally; enclosure normal, lateral spheres largely striate and chagreened anteriorly, rugose-reticulate medially, striate on extreme lateral portions; tegulae shiny, impunctate anteriorly.

Abdomen. Petiole shiny, equal in length to hind femur, dorsal surface with two longitudinal, posteriorly-converging carina forming a mesally sulcate area; pygidium absent.

TYPES. Holotype, male, Bowie, Maryland, May 30, 1944 (H. K. Townes). (U. S. National Museum). Paratypes: males, Midland Co., Michigan, Aug. 26, 1958 (R. R. Dreisbach). (Dreisbach collection); Washington, D. C., May 15, 1944 (G. E. Bohart). (University of California, Davis, California).

DISTRIBUTION. District of Columbia, Maryland, Michigan.

DIAGNOSIS. This species is closely allied to the two other species, canadensis and mellipes. Males of sodalis can be easily distinguished from the former by the finely punctate condition of the frons, vertex, gena and mesonotum, and from the latter by the absence of a contrastingly darkened color of

the tenth antennal flagellar segment and the less highly elevated form of the antennal tyloides.

DISCUSSION. Females of this species have not yet been recognized. When found they will undoubtedly have the characteristically broad pygidium of the "clypeata" group but will probably differ from canadensis and mellipes in the finely punctate character of the frons, gena, vertex and mesonotum, and by the possession of a post-ocellar furrow which is virtually lacking in those other closely related species. The apparent discontinuous nature of the distribution can only be explained by the scarcity of specimens. It is thought that future collections may help confirm the supposition that sodalis is largely sympatric in distribution with mellipes.

BIOLOGY. Nothing is known on the biology of this species.

Mimumesa columbiana new sp.

DESCRIPTION. Female. Averaging near 7.5 mm. long, forewing 5.6 mm. long. Black; tegulae and most of tarsi, amber. Wings hyaline, stigma and veins dark brown. Vestiture silvery, decumbent and moderately dense on lower frons and clypeus, more sparse and erect elsewhere.

Head. Moderately shiny above; clypeus and lower frons

mostly finely punctate; clypeus nearly three times as broad as long and distinctly wider than narrowest distance between compound eyes; apex obtusely bidentate with a further lateral tooth on each side; longitudinal median carina complete to median ocellus, arising from a distinct tumid area between antennal bases; transverse facial carinae present; upper frons mostly chagreened immediately above antennal bases, becoming closely and deeply punctate to near striato-punctate above, mostly striato-punctate lateral of ocellar area; vertex striato-punctate to striate; distance from compound eye to lateral ocellus approximately one and one-quarter times the distance between lateral ocelli; post-ocellar furrow connecting posterior margins of lateral ocelli, posterior of which there is a broad but weak tumid area; gena glossy with at most very fine piliferous punctations; antennae as in mixta.

Thorax. Shiny; mesoscutum with many deep punctations, nearing striato-punctate medially, conspicuously striate on posterior one-quarter; notaulices indistinct, weakly evident anteriorly; mesoscutellum less punctate than mesoscutum; postscutellum irregularly chagreened throughout; mesopleuron with anepisternum only moderately shiny, mostly impunctate but with some fine irregularities near dorsal margin, katepisternum finely striate on much of surface; propodeum with dorsal area shiny, traversed by numerous parallel striations

which are frequently contiguous with striations on the anterior portions of the lateral spheres, lateral carinae distinct, not highly elevated medially, becoming evanescent anterio-laterally, enclosure normal, lateral spheres striate anteriorly, rugose-reticulate medially, striate on extreme lateral areas; tegulae shiny, impunctate anteriorly.

Abdomen. Petiole shiny, sub-equal in length to hind femur, dorsal surface with two well-developed, posteriorly-converging, longitudinal carinae forming a medially sulcate area; pygidium narrow, chagreened throughout, sparsely pubescent, with a few scattered, deep, piliferous punctations.

Male. Length averaging near 6 mm., forewing 4 mm. long. Much as in female but with a reddish tinge to appendages, lighter brown color on antennae, with antennal tyloides oblong to ovate in shape on flagellar segments two to ten.

TYPES. Holotype, female, Carbonate, Columbia River, British Columbia, July 7-12, 1908 (J. C. Bradley) (Cornell University collection); allotype, male, Rogers Pass, British Columbia, Aug. 1, 1908 (J. C. Bradley). Paratypes: 5 females, 1 male, Carbonate, Columbia River, British Columbia, July 7-12, 1908 (J. C. Bradley); 1 male, Clymont, Alberta, June 23, 1936 (E. H. Strickland); 1 female, Flat Creek, Alberta, Aug. 12, 1942 (J. L. Carr); 2 females, Seattle, Wash.; 1 female, Olympia, Wash.; 1 female, University of Wyoming Camp, Medicine Bow

Range, Wyoming, Aug., 1929 (T. D. Cockerell); 1 female, 1 male, Teton National Park, June 20-30, 1941 (G. E. Bohart); 1 male, Sandpoint, Idaho, June 21, 1955 (G. E. Bohart). Location of paratypes: Cornell University; University of California, Davis; University of Idaho; University of Alberta; U. S. National Museum.

DISTRIBUTION. British Columbia, Washington, Alberta, Idaho and Wyoming.

DIAGNOSIS. This species is very similar to mixta, differing in both sexes by the nearly impunctate condition of the gena, and additionally in the male by the presence of antennal tyloides on flagellar segments two to ten.

DISCUSSION. The distribution of columbiana is apparently sympatric in its westerly range with mixta and sympatric in its easterly range with leucopus. It is possible that columbiana originally arose through limited hybridization with divergent populations of the "mixta-leucopus" ancestral form since columbiana exhibits anatomical features present in both those species. Isolating mechanisms, which allowed for reproductive isolation of columbiana, are obscure.

BIOLOGY. Nothing is known of the habits of this species.

Mimumesa leucopus (Say) n. comb.

Psen leucopus Say 1837:370 (male and female); Packard 1867: 398 (redescription); Fox 1898:7
Mimesa leucopus, Viereck 1901:342
Psen (Mimumesa) leucopus, Malloch 1933:20
Mimesa (Mimumesa) leucopus, Krombein 1951:961
Psen niger Packard 1867:399 (in part); Fox 1898:6 (redescription, male and female). New Synonymy
Mimesa nigra, Viereck 1901:340
Psen (Mimumesa) niger, Malloch 1933:20
Mimesa (Mimumesa) nigra, Krombein 1951:961
Psen elongatus Packard 1867:400 (male); Fox 1898:7 (synonymy)
Psen regularis Fox 1898:6 (female). New Synonymy
Mimesa regularis, Viereck 1901:339
Mimesa (Mimumesa) regularis, Krombein 1951:961
Mimesa mandibularis Smith 1908:392 (female); Mickel 1920:361 New Synonymy
Mimesa (Mimumesa) mandibularis, Krombein 1951:961

DESCRIPTION. Female. Average length 7.5 mm., forewing 5.3 mm. long. Black; variable portions of tarsi yellow; tegulae, infrequently portions of legs and antennae, red-brown to brown. Wings hyaline, stigma and veins dark brown. Vestiture silvery, much as in mixta.

Head. Shiny above; clypeus and lower frons mostly finely punctate; clypeus approximately two and one-half times as broad as long and distinctly wider than narrowest distance between compound eyes, apex narrowly emarginate to obtusely bidentate; longitudinal median carina complete to median ocellus, more pronounced ventrally, arising from a tumid area between antennal bases; transverse facial carinae distinct, frequently broadened; upper frons punctate to striato-punctate below ocellar area; moderately punctate laterad of

ocelli; vertex punctate, never striate; distance from compound eye to lateral ocellus more than one and one-half times the distance between lateral ocelli; post-ocellar furrow connecting lateral ocelli behind, shallow medially, forming anterior margin of a broad, indistinct, tumid area; gena at most finely punctate, never striate; occipital carina complete to its juncture with the hypostomal carina; antenna with first flagellar segment equal in length to scape and about three-quarters length of flagellar segments two and three combined.

Thorax. Shiny; mesoscutum moderately punctate with punctations separated by two or more times their own diameters, posterior margin striate; notaulices distinct, forming well-defined furrows at least one-third of distance along mesoscutum; mesoscutellum shiny, only sparsely and finely punctate; postscutellum mostly chagreened; mesopleuron with anepisternum glossy, impunctate to sparingly and finely punctate, katepisternum glossy, commonly finely and sparingly punctate, generally with some striations frequently confined to anterior and posterior margins; propodeum as in mixta; tegulae shiny, impunctate anteriorly.

Abdomen. Petiole shiny, at least as long as hind femur, dorsal area with two posteriorly converging longitudinal carinae commonly forming a medially sulcate area; pygidium narrow, chagreened, with two nearly lateral rows of deep piliferous punctations, otherwise nearly glaberous.

Male. Averaging 7 mm. long, forewing 4.8 mm. long. Much like female but more slender in form; frequently with reddish-brown tinges to appendages; antennal tyloides oval to oblong in form, present only on seventh and eighth flagellar segments.

TYPES. Of leucopus: holotype, female, "apparently lost." Of nigra: holotype, female, (desig. by Fox) "Virginia" (Philadelphia Academy of Sciences); allotype, not designated. Of elongatus: holotype, male, "Illinois" (Philadelphia Academy of Sciences); allotype, not designated. Of regularis: holotype, female, "New Jersey" (Philadelphia Academy of Sciences); allotype, not designated. Of mandibularis: holotype, female, Glen, Sioux Co., Nebraska, Aug. 21, 1906 (P. R. Jones) (University of Nebraska); allotype, not designated.

DISTRIBUTION. Eastern and central North America to approximately 110 degrees west longitude, and Utah.

MATERIAL EXAMINED. MICHIGAN: Osceola Co., June 29, 1957 (1 male); Ontonogan Co., June 18, 1960 (2 males), June 28, 1955 (1 male); Mackinac Co., July 8, 1959 (1 male, 3 females), June 7, 1960 (1 male), June 7, 1957 (1 male), June 18, 1955 (1 male); Bois Blanc Is., Mackinac Co., (2 males); Keweenaw Co., June 26, 1955 (2 males); Iron Co., June 13, 1960 (1 male); Midland Co., July 17-27, 1960 (1 male), June 16, 1952

(1 female), July 18-22, 1959 (1 female); Ogemaw Co., July 28, 1957 (1 male), Aug. 1-2, 1959 (1 female); Ostego Co., July 7, 1959 (1 male); Schoolcraft Co., June 18, 1955 (1 male); Chippewa Co., June 25, 1960 (1 male, 1 female); Clare Co., May 23, 1959 (1 male); Luce Co., June 7, 1959 (1 male); Emmet Co., May 27, 1960 (1 male); Mecosta Co., July 24, 1948 (1 male); Houghton Co., Aug. 20, 1959 (1 male, 1 female); Shiawassee Co., May 29, 1959 (1 female); Muskegon Co., July 5, 1958 (1 female); Charlevoix Co., May 31, 1960 (1 female); Baraga Co., June 25, 1955 (1 female); Aug. 18, 1959 (1 female); Gladwin Co., Aug. 3, 1957 (1 female); all collected by R. & K. Dreisbach.

MINNESOTA: Grand Rapids, July 7, 1935 (C. E. Mickel & H. S. Telford) (2 males, on Angelica); Jenkins, Aug. 13, 1935 (C. E. Mickel) (1 female); Grand Marais, Aug. 13, 1922 (H. H. Knight) (1 female); Laporte, July 4, 1935 (D. G. Denning) (1 female); Floodwood, July 2, 1935 (D. G. Denning) (1 female); Olmsted Co., June, 1905 (1 female).

NEW YORK: Ithaca, Aug. 9, 1894 (1 male), June 29, 1949 (H. E. Evans) (1 female), June 17, 1928 (H. E. Evans) (1 female), July 30, 1902 (1 female), June 12, 1935 (1 female), Aug. 12, 1935 (1 female), July 26, 1956 (H. E. Evans) (1 male), July 26, 1935 (D. T. Ries) (1 male), July 16, 1886 (G. McCargo) (1 male), July 9, 1891 (1 male), July 15, 1929 (P. P. Babiy) (1 male); Kite Hill campus, Ithaca, July 22,

1929 (P. P. Babiy) (1 male, on Daucus carota); Six Mile Cr., Ithaca, Aug. 27, 1958 (H. E. Evans) (1 male); Caroline-Tarford, June 15, 1904 (1 male); Dryden Lk., Tompkins Co., June 16, 1904 (2 males); Mich. Swamp, Tompkins Co., Aug. 23, 1920 (1 female); July 12, 1921 (1 male); Elka Park, Aug. 12-18, 1917 (C. J. Drake) (1 female); Cranberry Lake, July 3, 1917 (C. J. Drake) (1 female); Bluff Point, June 25, 1915 (1 male); Black Brook, June 21, 1915 (1 male).

WISCONSIN: Worden Twnsp., Clark Co., July 25, 1918 (1 male).

CONNECTICUT: Bethany, June 24-29, 1958 (H. E. Evans) (1 male, 1 female); Riverbank, E. Hartford, June 3, 1941 (H. E. Evans) (1 female).

NEW JERSEY: Browns Mills, Aug. 15, 1921 (1 female); New Lisbon, June 5, 1927 (1 female); Alpine, July 25, 1910 (1 male), July 11, 1897 (1 male).

MASSACHUSETTS: Holden, Aug. 10, 1905 (1 male); Chestnut Hill, Boston, Aug. 3, 1922 (1 male); Wellesley, June 2, 1891 (1 female).

NORTH CAROLINA: Valley of Black Mtns., July 23, 1906 (W. Beutenmuller) (1 male).

WEST VIRGINIA: Lost River St. Pk., Aug. 22-31, 1956 (K. V. Krombein) (1 male), July 12, 1951 (K. V. Krombein) (1 female), July 2, 1953 (K. V. Krombein) (1 female).

VIRGINIA: Dunn Loring, July 13, 1947 (K. V. Krombein)

(1 male).

NEW HAMPSHIRE: Lancaster, July 5, 1908 (P. H. Timberlake) (2 males); Durham, July 17, 1905 (J. C. Bridwell) (1 female); Pelham, Aug. 11, 1905 (1 female).

ILLINOIS: "Chicago" (1 female); Algonquin, Aug. 13, 1894 (1 female).

MARYLAND: Bowie, May 30, 1944 (H. K. Townes) (1 female); Norton's Landing, June 13, 1912 (1 female).

MAINE: Perry, Aug. 5, 1955 (1 male); Casco, Aug. 8, 1944 (J. C. Bradley) (1 female).

UTAH: Soldier Summit, Aug. 18, 1938 (G. F. Knowlton, F. C. Harmston) (1 female).

ONTARIO: Salinas, July 20, 1915 (1 male); Gravenhurst, Muskoka District, July 9, 1918 (1 male), Aug. 17, 1918 (1 female); Coniston, July 27, 1915 (1 male, 1 female); Waubamic, June 18, 1915 (1 male).

QUEBEC: Joliette, July 11, 1902 (2 males); Ile Perrot, Aug. 22, 1956 (H. E. Evans) (1 female); "Montreal" (1 male, 1 female), June 11, 1902 (1 female).

NEW BRUNSWICK: Fundy Nat. Pk., Aug. 1, 1954 (A. & H. Dietrich) (1 female).

DIAGNOSIS. This species is included in the "mixta" group in that females of leucopus possess a characteristically narrow, sparsely pubescent pygidium. Members of leucopus, however,

can readily be distinguished from other species within that group by the lack of striations on the vertex, gena, or meso-anepisternum.

DISCUSSION. Say's type of leucopus is not available, and his published description is too incomplete to be of use in determining this species. I have, therefore, decided to accept the interpretation of Say's species presented in Packard's redescription published in 1867, even though Packard failed to state whether or not Say's type was available to him at that time. Additionally, I am forced to accept the synonymy of elongatus as indicated by Fox, since the type of elongatus Packard apparently has been lost. In the case of synonymy of elongatus, however, an adequate description by Packard allows for comparison which strongly indicates the validity of this synonymy as proposed by Fox. Incidentally, the holotype of elongatus was a male, not a female as Packard stated. After examining a large series of specimens and the types of nigra, regularis and mandibularis, I believe these types appear to fall well within the range of variability of leucopus and are therefore considered synonyms.

Fox (1898) presented a redescription of niger in order to clarify that species. As Fox states, "Packard had confused the sexes of two species under niger, and I have retained as niger that which, in my opinion, best befits the

name." Fox selected the male Packard apparently used for his description as the holotype. I have not seen nor know of the present existence of the females which were before Packard when he made his original description and so I am unable to associate the original females with any present day recognized species.

If at some later date Say's type should be found and shown to be another species, the species herein considered as leucopus Say would then assume the name nigra Packard.

BIOLOGY. Detailed biology studies are lacking for this species. Krombein (1952) reports both males and females noted hovering before burrow entrances in logs of a cabin wall on June 19-21 and July 12, in the vicinity of Lost River State Park, West Virginia, during 1951. Specimens have been collected visiting flowers of Angelica, sp., and Daucus carota.

Genus Mimesa Shuckard

Mimesa Shuckard, 1837:228; Packard 1867:403; Krombein 1951: 960
Psen (Mimesa), Rohwer 1910:101; Mickel 1915:41; Malloch 1933: 26
Aporia Wesmael 1852:272
Aporina Gussakovskij 1901:338

Head. Front without a longitudinal median carina or transverse facial carinae, but with a distinct tubercle between the bases of antennae; clypeus with apex variable,

never noticeably thickened apically; occipital carina complete dorsally and laterally meeting or nearly meeting the hypostomal carina considerably distant from median line on venter; antennae of female distinctly clavate, less so in male.

Thorax. Pronotum with well-developed, subapical, transverse carina becoming more cristate laterally (sometimes spur-like), lateral lobes dark; prepectus triangular, well-defined; mesopleuron with episternal suture incomplete or weakly defined, effecting only partial separation of the mesoepisternum; upper portion of mesoepisternum not strikingly different in sculpture from lower portion; propodeum variably ornamented, commonly striate to rugose-reticulate; forewing with first recurrent vein joining second submarginal cell (rarely interstitial with first transverse cubital vein) and second recurrent vein received by second submarginal cell or interstitial with second transverse cubital vein; second submarginal cell narrowed above; hind wing with juncture of M and Cu veins proximad of cu-a cross vein; hind femur with inner surface evenly covered with fine hairs.

Abdomen. Red or black; petiole variable, dorsally flattened or convex, dorso-lateral margins rounded or carinate, seldom with distinct dorsal carinae or sulci throughout length, bearing a well-developed series of hairs

dorso-laterally; pygidium always present in female, variable in form but delimited laterally and posteriorly by a carina.

DISCUSSION. This genus along with Mimumesa, Psen, Pseneo and Ammopsen belong to the Pseni group as distinguished from the Diodonti group. Mimesa can be readily separated from Mimumesa by the general lack of dorsal carinae on the petiole, lack of a longitudinal median carina on the face, with only a weak or commonly incomplete mesoepisternal suture, and with a commonly well-ornamented meso-anepisternum. The lack of a distinctly thickened apex of the clypeus at once distinguishes Mimesa from Pseneo, while the presence of a row of dorso-lateral hairs on the petiole serves to divorce Mimesa from Psen. Apart from size difference between Mimesa and the much smaller Ammopsen, the presence of a complete occipital carina and transverse, dorsal, subapical, pronotal carina serves to distinguish Mimesa from Ammopsen in which the aforementioned characters are lacking.

GENEROTYPE. Trypoxylon equestre Fabricius.

DISTRIBUTION. Widespread throughout the United States, Canada and Alaska.

BIOLOGY. Our knowledge of the biology of these insects is again fragmentary particularly with respect to North American forms. From meager data, it appears likely that nearctic

members of Mimesa, like their palaearctic counterparts, nest in generally light-textured soils, excavate their own burrows and prey upon various species of Cicadellidae. Detailed biological information on American forms is non-existent but since casual observations made on North American members of the genus tend to substantiate their similarity to European forms regarding nesting habits and prey utilized, it is pertinent to mention some of Spooner's reports on European species. Spooner indicates members of Mimesa nest in predominantly sandy soil, excavating burrows generally 20-35 cms. long, initially vertical but turning horizontal at varying distances below the soil surface. Frequently Mimesa females are found to be gregarious in nesting habit. Unlike Mimumesa, Mimesa females transport their prey securely "grasped" by the mesothoracic tarsi, with the prey carried head forward and in an inverted position. Commonly 12-30 leafhoppers are stocked within a single nest.

Little is known of the parasitoids of Mimesa although occasional references are made in European literature to parasitoidism of Mimesa spp. by members of the Chyrisididae genus Notozus. No observations of this nature have been made on the nearctic species.

Floral visitation records are numerous for Mimesa, particularly for species collected in the western United States,

Flowers, belonging to the following genera, are commonly visited by adults: Helianthus, Tamarix, Chrysothamnus, Daucus, Potentilla, Penstemon, Cryptantha, Eriodictyon, Geranium, Eriogonum, Solidago and Veratrum.

KEY TO THE NEARCTIC SPECIES OF MIMESA OCCURRING NORTH OF MEXICO

1. Antennae 12-segmented; pygidium present (females)..... 2

-- Antennae 13-segmented; pygidium rarely present (males) 16

2. Abdomen with first tergite red, infrequently with an anterior reddish-brown maculation..... 3

-- Abdomen with first tergite partly to entirely black... 7

3. Propodeum with lateral spheres smooth and shiny or finely striate; petiole nearly equal in length to hind femur, usually round in cross-section and without distinct dorso-lateral carinae..... 4

-- Propodeum with lateral spheres strongly striate or rugose-reticulate; petiole shorter than hind femur, usually rectangular in cross-section and with distinct dorso-lateral carinae..... 5

4. Clypeus with a small subapical tumidity; propodeum with lateral spheres smooth and shiny; hind coxa with a ventral carina confined to basal portion of coxa; occipital suture evanescent a short distance before juncture with hypostomal carina,..... dawsoni Mickel

-- Clypeus evenly convex; propodeum with lateral spheres at least partly, finely striate; hind coxae with a complete ventral carina; occipital carina complete to juncture with hypostomal carina..... cressoni Packard

5. Petiole convex above, usually with dorso-lateral sulci. 6

-- Petiole concave above, without dorso-lateral sulci..... ..... basirufa Packard

6. Fore tibia with at least inner surface red; propodeum with lateral area of lateral spheres chagreened to finely striate..... pygidialis (Malloch)

-- Fore tibia black; propodeum with lateral areas of lateral spheres smooth and shiny..... sabina n. sp.

7. Pygidium narrow, sides parallel, width at base no more than one-third the width of sixth abdominal tergite at its widest point..... 8

-- Pygidium broad, triangular, width at base more than one-half the width of sixth abdominal tergite at its widest point..... 9

8. Pygidium uniformly dark in color; meso-katepisternum finely striate, particularly along posterior margin.... ..... barri n. sp.

-- Pygidium with a mesal orange-colored area; meso-katepisternum granulate..... agalena n. sp.

9. Abdomen with at least part of second tergite red..... 10

-- Abdominal tergites without red basal markings, apices of some tergites more or less brown..... maculipes (Fox)

10. Pronotum with lateral angles rounded or angulate..... 11

-- Pronotum with lateral angles extended as spike-like projections..... punctifrons (Malloch)

11. Clypeus with apex distinctly dentate and with a subapical tumidity..... 12

-- Clypeus with apex truncate or emarginate, never dentate, and generally without a subapical tumidity..... 14

12. Clypeus with a transverse subapical tumidity; fourth abdominal tergite dark in color..... 13

-- Clypeus with a prominent, triangular, subapical elevation; fourth abdominal tergite usually with some red coloration. ..... coquilletti (Rohwer)

13. Propodeum with lateral spheres largely rugose-reticulate; clypeus densely covered with silvery pubescence..... ..... ezra Pate

-- Propodeum with lateral spheres largely striate; clypeus at most moderately clothed with silvery pubescence..... ..... spatulata n. sp.

14. Propodeum with lateral spheres granulate or striate, if rugose then fore tibia evenly dark in color..... 15

-- Propodeum with lateral spheres rugose-reticulate; fore tibia with some reddish coloration..... pauper Packard

15. Propodeum with lateral spheres finely to coarsely striate; fore tibia dark in color..... unicincta (Cresson)

-- Propodeum with lateral spheres rugose-reticulate or if granulate or striate then fore tibia with some reddish

coloration..... gregaria (Fox)

16. Abdomen with first tergite red, infrequently with an anterior reddish-brown maculation..... 17

-- Abdomen with first tergite partly to entirely black.... 22

17. Propodeum with lateral spheres smooth and shiny or finely striate; petiole equal in length to hind femur, round in cross-section and without distinct dorso-lateral carinae.. 18

-- Propodeum with lateral spheres strongly striate or rugose-reticulate; petiole commonly shorter in length to hind femur, rectangular in cross-section and with distinct dorso-lateral carinae..... 19

18. Propodeum with lateral areas smooth and shiny; antennal tyloides not discernible..... dawsoni Mickel

-- Propodeum with lateral areas at least partly striate; antennal tyloides prominent on flagellar segments two to five..... cressoni Packard

19. Petiole convex dorsally, commonly with dorso-lateral sulci..... 20

-- Petiole concave dorsally, without dorso-lateral sulci.. ..... basirufa Packard

20. Antennal flagellum with tyloides present on at least segments two to five; propodeum with lateral spheres mostly rugose-reticulate..... 21

-- Antennal flagellum without tyloides; propodeum with

lateral spheres mostly finely striate.....
..... arizonensis (Malloch)

21. Sixth abdominal tergite with an evident marginal raised line on apical portion, simulating the pygidial lateral carina of female; tibiae usually partly to entirely red..
..... pygidialis Malloch

-- Sixth abdominal tergite evenly rounded dorsally, without a marginal raised line; tibiae usually black, fore tibia infrequently more or less red..... sabina n. sp.

22. Abdomen without red basal markings, apices of some tergites more or less brown..... 23

-- Abdomen with apical part of first tergite and at least part of second tergite red..... 24

23. Antennal flagellum with elongate-oval tyloides present on at least segments two to six; propodeum with lateral spheres mostly rugose-reticulate; third abdominal sternite much shorter than second sternite and less than twice as long as width at its base..... maculipes (Fox)

-- Antennal flagellum without distinct tyloides; propodeum with lateral spheres at most finely reticulate; third abdominal sternite subequal in length to second sternite and at least twice as long as its width at base.....
..... granulosa (Fox)

24. Meso-katepisternum roughened throughout, mostly striate to finely striato-punctate..... 25

-- Meso-katepisternum nearly smooth, at most chagreened and with widely spaced, fine punctations, if striate, striations restricted to anterior and/or posterior episternal margins.....26

25. Fore tibia largely black; propodeum with lateral spheres granulate or finely striate; antennal flagellum with tyloides frequently discernible on segments two to five... ..... agalena n. sp.

-- Fore tibia reddish in color; propodeum with lateral spheres partly rugose-reticulate; antennal flagellum without discernible tyloides..... barri n. sp.

26. Pronotum with lateral angles rounded or angulate..... 27

-- Pronotum with lateral angles extended as spike-like projections..... punctifrons (Malloch)

27. Petiole shorter than hind femur and not distinctly flattened above; antennae not noticeably longer than head and thorax combined, penultimate segment about as long as broad.....28

-- Petiole longer than hind femur and somewhat flattened above; antennae noticeably longer than head and thorax combined, penultimate segment distinctly longer than broad..... ezra Pate

28. Propodeum with dorsal area traversed by mostly parallel, fine to coarse striations, lateral spheres distinct anteriorly from dorsal area..... 29

-- Propodeum with dorsal area finely rugose-reticulate, lateral spheres indistinctly separated anteriorly from dorsal area..... gregaria (Fox)

29. Antennal flagellum with tyloides present on at least segments two to five.....30

-- Antennal flagellum without tyloides.....31

30. Propodeum with lateral spheres generally striate; fore tibia black..... unicincta (Cresson)

-- Propodeum with lateral spheres rugose-reticulate; fore tibia partly to entirely red..... pauper Packard

31. Vertex dull, closely punctate, without a post-ocellar tumidity; forewing with costal vein dark brown except near humeral area..... spatulata n. sp.

-- Vertex shiny, sparsely punctate, generally with a post-ocellar tumidity; forewing with costal vein whitish for at least most of its length..... coquilletti (Rohwer)

Mimesa dawsoni Mickel

Mimesa dawsoni Mickel 1916:420 (male)
Mimesa (Mimesa) dawsoni, Krombein 1951:960
Psen (Mimesa) politus Malloch 1933:35 (male and female). New Synonymy.
Mimesa (Mimesa) polita, Krombein 1951:960

DESCRIPTION. Female. Length averaging 8.5 mm. Black; undersides of antennal flagella, tegulae, tarsi, fore and mid tibiae, proximal quarter of hind tibiae, yellow to fulvous-yellow; remainder of legs brown to black; abdominal tergites one to three, sternites two and three, distal portion of petiole beneath, red. Wings hyaline, veins fuscous, much lighter proximally, stigma brown with proximal whitish area. Pubescence silvery.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus finely punctate, apex commonly medially notched and with a mid-lateral angulation or tooth (similar to cressoni) on each side equidistant between one another and extreme lateral margin, and with a small, rounded subapical tubercle; frons with a well-developed tubercle between the lower margins of the antennal insertions; upper frons finely and closely punctate around anterior ocellus, much more sparsely punctate laterally and above; vertex shiny, sparingly punctate, some lateral chagreening, without a post-ocellar tumidity or furrow; gena as in cressoni; occipital carina distinct, becoming nearly to entirely evanescent at

juncture with hypostomal carina; antenna with first flagellar segment approximately one and one-half times as long as second flagellar segment; width of last flagellar segment greater at base than width of scape.

Thorax. Pronotum normal. Mesoscutum shiny, finely chagreened, with widely spaced, fine punctations; notaulices distinct anteriorly; parapsidal lines distinct; mesoscutellum glossy, nearly impunctate, not chagreened; postscutellum with surface dull and irregular, with many long silvery hairs; mesoepisternum with both anepisternal and katepisternal areas chagreened to granular, not striate; propodeum with dorsal area only vaguely discernible from lateral spheres, fine striations on dorsal area terminating at lateral spheres, lateral spheres shiny, at least anteriorly, otherwise mostly chagreened to granular, hirsute, enclosure deep, not flanked by carinae, extreme lateral areas nearly smooth and glossy; hind coxa at least twice as long as hind trochanter and lacking evidence of a distinct longitudinal, ventral carina.

Abdomen. Petiole rounded above, without dorso-lateral carinae, dorsal surface at most only finely chagreened anteriorly; ratio of length of petiole to first abdominal tergite (lateral aspect) to hind femur -- 4:3:4.5; first abdominal tergite not greatly elevated above petiole; pygidium broad, delimited by a well-developed carina, striato-punctate throughout.

Male. Length averaging 7 mm. Similar to female, except in following respects: clypeal apex more rounded with a moderate central emargination; antennae similar to female but with first flagellar segment shorter, tyloides not discernible; lateral spheres of propodeum frequently less shiny; no delimited pygidial area.

TYPES. Of dawsoni: holotype, male, Harrison, Nebraska, Aug. 12, 1912 (R. W. Dawson) (University of Nebraska); allotype, not designated. Of polita: holotype, male, 0.5 mi. w. Thoreau, New Mexico, July 24, 1929 on Salsola pestifer (U. S. National Museum, No. 44213); allotype, female, Meadow Grove, Nebraska, July 18, 1929 (C. N. Ainslie) (U. S. National Museum).

DISTRIBUTION. Northeastern United States west to Kansas and Montana.

MATERIAL EXAMINED. MINNESOTA: Fridley sand dunes, Anoka Co., July 24, 1923 (C. E. Mickel) (3 females, 8 males), June 18, 1923 (C. E. Mickel) (1 male), July 13, 1932 (C. E. Mickel) (4 males), July 14, 1922 (A. A. Nichol) (1 male), Aug. 8, 1924 (R. W. Dawson) (1 female), Aug. 8, 1924 (Walter Carter) (1 male, 1 female), July 26, 1923 (R. W. Dawson) (2 females), July 25, 1927 (R. W. Dawson) (1 female), June 30, 1923 (H. H. Knight) (1 male); Jordan sand area, July 13, 1923 (A. T.

Hertig) (2 males); Anoka Co., June 23, 1936 (H. R. Dodge) (1 male).

MICHIGAN: 5 mi. n.w. Whitmore Lake, Livingston Co., July 9, 1950 (U. N. Lanham) (1 male); Newaygo Co., July 12, 1953 (R. R. Dreisbach) (1 male); Midland Co., Aug. 26, 1958 (R. R. Dreisbach) (1 female).

NEBRASKA: Thedford, Aug. 31, 1960 (R. D. Dreisbach) (2 females); Halsey, Aug. 30, 1924 (R. W. Dawson) (1 female).

KANSAS: Kearny Co., Aug. 19, 1952 (H. E. Evans) (1 male); Salt Flats area, Stafford Co., July 20, 1953 (Evans, Lin & Yoshimoto) (1 male).

IOWA: Sand dunes, Sgts. Bluff, Aug. 3, 1933 (C. N. Ainslie) (1 male).

NEW YORK: Oak J., July (1 male); Fire Island, July 12, 1935 (1 female).

MONTANA: "Montana" (1 male).

DIAGNOSIS. This species is immediately distinguishable from all other Mimesa by the smooth and impunctate character of the lateral spheres of the propodeum.

DISCUSSION. Examination of Malloch's types of polita compared with Mickel's type of dawsoni reveals practically no differences and leaves little doubt as to the validity of the present synonymy. Since Mickel's description is complete and since Malloch failed to refer to dawsoni in his revisional

study, it appears certain Malloch was unaware of the existence of dawsoni.

BIOLOGY. This species has been taken frequently in sandy soil areas and may perhaps be generally associated with such soil areas. No details are known on the biology of this species.

Mimesa cressoni Packard

Mimesa Cressonii Packard 1867:405 (female); Mickel 1916:421
Psen Cressonii, Fox 1898:12 (male)
Psen (Mimesa) cressoni, Malloch 1933:31
Mimesa (Mimesa) cressonii, Krombein 1951:960
Mimesa denticulata Packard 1867:406; Fox 1898:12 (synonymy)
Mimesa conica Smith 1908:389 (male, not female); Mickel 1916:421 (synonymy)
Psen (Mimesa) cressoni atriventris Malloch, 1933:31. New Synonymy

DESCRIPTION. Female. Length averaging near 8 mm. Black; tegulae, undersides of antennal flagella, broadly yellow-testaceous; variable portions of legs brown; first abdominal tergite, abdominal segments two, three and commonly much of four, red. Wings hyaline, stigma brown with a proximal pale area, veins brown, lighter basally. Pubescence silvery, bronze on face of some specimens (including holotype).

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus shiny, only moderately punctate, apex broadly truncate, without a subapical tumidity; frons with well-developed tubercle between lower margins of

antennal insertions; upper frons closely punctate, striato-punctate near anterior ocellus; vertex mostly shiny, sparingly punctate, without a postocellar tumidity or furrow; gena reflexed moderately abruptly near lower eye level above which are distinct striations, below which area is smooth, shiny and nearly impunctate; occipital carina complete to juncture with hypostomal carina; antenna with first flagellar segment approximately one and one-half times as long as second flagellar segment; width of last flagellar segment distinctly greater at base than width of scape.

Thorax. Pronotum normal. Mesoscutum shiny, finely chagreened at least on anterior portion, with widely spaced punctations; notaulices distinct anteriorly; parapsidal lines distinct; mesoscutellum glossy, with few punctations, not chagreened; postscutellum with surface dull and irregular, covered with moderate numbers of long silvery hairs; mesoepisternum with anepisternal area granular, frequently with an indication of irregular longitudinal striations (more pronounced on holotype), katepisternal area mostly chagreened to finely granular, with some fine punctations, commonly with fine striations posteriorly; propodeum with dorsal area not greatly differentiated from lateral spheres, fine striations continuous obliquely from dorsal area across spheres, lateral spheres mostly smooth and shiny, enclosure deep, not flanked by carinae, extreme lateral areas of propodeum smooth to

granular; hind coxa at least twice as long as hind trochanter and with a complete longitudinal, ventral carina.

Abdomen. Petiole rounded above and laterally, without dorso-lateral carinae, dorsal surface at most only finely chagreened anteriorly; ratio of length of petiole to first abdominal tergite (from lateral aspect) to hind femur -- 4.5:3.5:4.75; first abdominal tergite highly elevated (humped) above petiole; pygidium broad, delimited by a well-developed carina, deeply punctate and chagreened, piliferous on apical portion.

Male. Length averaging 7 mm. Similar to female but differing in following respects: antennae with flagellum less clavate than in female and with first flagellar segment distinctly less than one and one-half times as long as second flagellar segment, flagellar segments two to five or six with conspicuous, angulate tyloides; propodeum with dorsal and lateral spheres commonly less striate and more granulate; no delimited pygidial area.

TYPES. Of cressoni: holotype, female, "New Jersey" (Philadelphia Academy of Sciences); allotype, not designated. Of denticulata: holotype, male, "Illinois" (Philadelphia Academy of Sciences); allotype, not designated. Of conica: holotype, male (University of Nebraska); allotype, not designated. Of atriventris: holotype, male, "Canada".

(Baker collection, No. 2068). (U. S. National Museum, No. 44212); allotype, not designated.

DISTRIBUTION. United States and Canada, south to Georgia and Kansas, west to Oregon and Alberta.

MATERIAL EXAMINED. MINNESOTA: Fridley sand dunes, Anoka Co., Aug. 8, 1924 (Walter Carter) (4 males, 1 female), July 11, 1924 (R. W. Dawson) (1 male), Aug. 10, 1924 (R. W. Dawson) (2 males), July 24, 1923 (C. E. Mickel) (1 male), July 3, 1924 (C. E. Mickel) (1 male); Rice Creek, Anoka Co., Aug. 11, 1924 (R. W. Dawson) (1 male, 1 female); St. Anthony Park, Ramsey Co., Sept. 14, 1924 (Walter Carter) (1 female); Sebeka, Aug. 9, 1935 (C. E. Mickel) (1 female); Yellow Medicine Co., Aug. 13, 1936 (C. E. Mickel) (2 females, 10 males); Luverne, Sept. 13-14, 1935 (A. E. Pritchard, C. E. Mickel, H. S. Telford) (9 males, 2 females); Lancaster, Aug. 26, 1936 (D. G. Denning) (1 female, 3 males); Kittson Co., Aug. 6-28, 1936 (D. G. Denning) (3 males, 3 females); Fort Snelling, Aug. 13, 1924 (R. W. Dawson) (1 male, 1 female); High Prairie, July 29, 1925 (C. E. Mickel) (1 female); Itaska Park, Aug. 15, 1936 (W. A. Riley) (1 female, 1 male); Marshall Co., Aug. 11, 1936 (1 female); Aug. 4, 1936 (D. G. Denning) (1 male); Crookston, Aug. 30, 1936 (D. G. Denning) (6 males), July 7, 1935 (D. G. Denning) (1 male); Polk Co., Aug. 14-15, 1936 (D. G. Denning) (4 males), Aug. 16, 1936

(R. H. Daggy) (1 male), Sept. 6, 1936 (D. G. Denning) (1 male), July 29, 1936 (D. G. Denning) (1 male); Pennington Co., Sept. 5, 1936 (D. G. Denning) (2 males); Willmar, Sept. 10, 1935 (H. S. Telford) (5 males); Red Lake Co., Sept. 5, 1936 (D. G. Denning) (1 male); Rock Co., Aug. 16, 1936 (C. E. Mickel) (1 male); Lake Benton, Sept. 12, 1935 (A. E. Pritchard) (2 males); Sedan, Sept. 19, 1929 (D. G. Denning) (1 female); Dunes near Jordan, Scott Co., Aug. 1, 1922 (Wm. E. Hoffman) (2 males); Hallock, Aug. 23, 1936 (D. G. Denning) (1 male); Middle River, July 25, 1935 (D. G. Denning) (1 male); Hessepin Co., Aug. 2, 1920 (H. H. Knight) (1 male).

GEORGIA: Atlanta, Oct. 11, 1902 (Bridwell) (2 females).

MICHIGAN: Hillsdale, Sept. 8, 1953 (R. R. Dreisbach) (2 males); Ag. Coll., June 27, 1890 (1 male); Mecosta, July 26, 1952 (R. R. Dreisbach) (4 males); Kalamazoo Co., Sept. 5, 1953 (R. R. Dreisbach) (1 female); Manistu Co., July 5, 1952 (R. R. Dreisbach) (1 female); July 17, 1940 (R. R. Dreisbach) (1 female); N. E. of Portage Lake, Livingston Co., June 5, 1949 (U. N. Lanham) (1 female); Deerfield Twnp., Lapeer Co., Sept. 5, 1936 (G. Steyskal) (1 female).

IDAHO: 12 mi. n. w. Regina, Ada Co., July 11, 1952 (W. F. Barr) (5 males); Kimama, Minnedoka Co., Aug. 14, 1930 (1 male); 6 mi. n. Hazelton, Jerome Co., Sept. 9, 1954 (A. R. Gittins) (1 male); 3 mi. n. Hazelton, Jerome Co., July 10,

1954 (A. R. Gittins) (1 male); Murtaugh, Cassia Co., Aug. 9, 1930 (1 male), July 9, 1931 (D. E. Fox) (1 male); Downey, Bannock Co., Aug. 19, 1947 (G. E. Bohart) (1 male); Arimo, Bannock Co., Sept. 16, 1925 (R. W. Haegele) (1 male); 5 mi. n. Bliss, Gooding Co., June 22, 1955 (J. E. Gillaspy) (1 male), July 23, 1955 (J. E. Gillaspy) (1 male); 2 mi. e. Spencer, Clark Co., July 15, 1956 (W. F. Barr) (1 female); Rigby, Jefferson Co., July 23, 1936 (H. S. Telford) (1 male); Homedale, Owyhee Co., June 10, 1958 (H. W. Homan) (1 female); Hollister, July 10, 1930 (1 female); Berger, Sept. 5, 1930 (1 female); 6 mi. n. Roberts, Jefferson Co., July 29, 1958 (W. F. Barr) (1 female).

WYOMING: Cheyenne, Aug. 11, 1949 (R. R. Dreisbach, R. K. Schwab) (1 male), June 7, 1907 (Fanny T. Hartman) (1 female); "in mountains near Sheridan" (1 male).

VIRGINIA: Newington, Fairfax Co., (S. A. Rohwer) (1 female); Falls Chur., Sept. 1910 (S. A. Rohwer) (1 male), Sept. 10, 1918 (2 females), Oct. 11, 1885 (1 female); Charlottesville, June 21, 1920 (K. M. King) (1 female).

VERMONT: "Lyndon" (1 male).

KANSAS: Riley Co., June 1, 1952 (H. E. Evans) (1 female); "Kansas" (1 male, 2 females); Lakin, Aug. 28, 1951 (R. R. Dreisbach) (1 female); Manhattan, June 10, 1930 (H. E. Evans) (3 males), June 4, 1950 (H. E. Evans) (4 males); Barber Co., May 20-26, 1950 (H. E. Evans) (7 males); Barton

Co., Aug. 22, 1952 (H. E. Evans) (1 male); Ellis Co., June 9, 1950 (R. H. Painter) (1 male); Kingman Co., May 25, 1950 (H. E. Evans) (2 males); Douglas Co., June 17, 1951 (J. G. Rozen) (1 male).

NEBRASKA: Harrison, Aug. 4, 1908 (C. H. Gable) (1 male); Halsey, Sept. 1, 1924 (R. W. Dawson) (2 males); Thedford, Aug. 31, 1960 (R. K. Dreisbach) (1 male); West Point, Sept. 13 (J. C. Crawford) (2 females); Glen Sioux Co., Aug. 17, 1906 (H. S. Smith) (2 females).

NORTH DAKOTA: Kidder Co., July 14, 1920 (A. A. Nichol) (1 male); Beach, Aug. 18, 1921 (C. N. Ainslie) (1 male), Aug. 12-28, 1921 (1 male, 1 female); Walford, Aug. 15, 1933 (1 male); Breica, Aug. 21, 1922 (O. A. Stevens) (1 female).

SOUTH DAKOTA: Spearfish, Sept. 5, 1944 (H. C. Severin) (1 male); Wasta, Pennington Co., June 3, 1941 (G. R. & A. M. Ferguson) (1 female); Ft. Pierre, Aug. 11, 1924 (H. C. Severin) (1 male); Hot Springs, July 14, 1924 (H. C. Severin) (1 male).

ILLINOIS: Algonquin, Aug. 16, 1895 (M. A. Cazier) (1 male); Havana, May 31, 1912 (M. A. Cazier) (1 male, 1 female).

IOWA: Sioux City, Aug. 30, 1922 (C. N. Ainslie) (1 male), July 17, 1940 (C. N. Ainslie) (1 female); "Iowa" (C. N. Ainslie) (1 female); Ames, Aug. 25, 1894 (1 male).

COLORADO: Boulder, July 31, 1888 (1 female), Aug. 6, 1960 (R. K. Dreisbach) (1 male); J. Martin Dam, Hasty,

Aug. 22, 1960 (R. K. Dreisbach) (3 females); Regnier, June 6-9, 1919 (2 males, 1 female); Lamar, June 4-11, 1919 (1 female); Limon, Aug. 26, 1951 (R. K. Dreisbach) (1 male); Denver, Aug. 28, 1919 (1 female, 2 males).

MONTANA: Bozeman, Sept. 8, 1958 (A. R. Gittins) (1 male); Glendive, Dawson Co., July 18, 1956 (R. C. Froeschner) (1 male); "Montana" (16 females, 4 males).

OREGON: Lake Labish, Marion Co., Aug. 7, 1941 (1 male).

WISCONSIN: Haitland (1 female); Worden Tnshp., Clark Co., July 27, 1919 (1 male).

UTAH: Logan, June 27, 1948 (John V. Bruce) (1 male); Corinne, June 24, 1937 (G. F. Knowlton) (1 male); Blue Creek, Aug. 5, 1929 (G. F. Knowlton) (1 male).

NEW YORK: Long Island, Aug. 28, 1906 (1 male); Mosholu, Sept. 1-10, 1919 (1 female, 1 male); North Creek, July 15, 1918 (W. T. M. Forbes) (1 female); Oswego, July 26, 1936 (K. V. Krombein) (1 male); Fishers Is., Aug., 1878 (1 male).

MASSACHUSETTS: W. Springfield (Geo. Dimmock) (1 male, 1 female); Woods Hole (1 female, 1 male); Needham, Sept. 1-2, 1945 (J. C. Bradley) (2 males); Sconset, Aug. 20, 1902 (J. L. Zabriskie) (1 male).

NEW JERSEY: Riverton, Sept. 5, 1898 (1 male); Lawnside, Sept. 13, 1904 (1 male); Camd. Co., Sept. 7, 1890 (1 male, 1 female).

NEW HAMPSHIRE: Pelham, Sept. 19, 1905 (J. C. Bridwell) (8 females), Aug. 3, 1905 (J. C. Bridwell) (1 female); Hanover (1 male).

NORTH CAROLINA: Valley of Black Mtns., Sept. 11, 1906 (W. Beutenmuller) (1 male).

PENNSYLVANIA: Germantown, Sept. 25, 1904 (1 female).

CONNECTICUT: East Hartford, Sept. 2, 1947 (H. E. Evans) (1 male).

ALABAMA: "Alabama" (1 male).

ALBERTA: Medicine Hat, Sept. 15, 1940 (J. L. Carr) (2 males), Sept. 10, 1939 (J. L. Carr) (1 female), Aug. 7, 1938 (E. H. Strickland) (1 female); Tilley, Aug. 18, 1940 (J. L. Carr) (1 female); Bow Island, June 30, 1923 (H. E. Gray) (1 male); Lethbridge, Aug. 15, 1939 (E. H. Strickland) (1 male); Stavely, Aug. 7, 1949 (N. S. Church) (1 male); "Alberta" (1 male, 1 female).

ONTARIO: Chatterton, June 6-13, 1941 (W. Wellington) (14 males, 1 female).

DIAGNOSIS. This species is among the more easily identified within the genus. The broadly yellow-testaceous undersides and lateral areas of the antennal flagella, large clavate nature of the antennae, fine sculpturing of the propodeum, elongate and rounded form of the petiole, cristate carinae of the hind coxae, all in both sexes, and the prominent character

of the antennal tyloides in the male, combine to easily separate this species from its allies.

DISCUSSION. Packard described cressoni from two female specimens, at least one of which had previously been examined by Cresson who considered it to be a new species. In the same paper Packard also described the species denticulata from two males, one of which was from the same locality as the cressoni holotype. An examination of both types later by Fox, and subsequently by myself, leaves little doubt as to the synonymy of denticulata with cressoni. Mickel added conica Smith to the synonymical list on cressoni in a short paper published in 1916 in which he points out that "Smith's type and paratypes of conica are all males of cressoni. They are not females as stated in Smith's paper." After examination of Smith's holotype, I must concur on the validity of this synonymy proposed by Mickel. Additionally I have examined the holotype of atriventris and consider it to be an abnormal color variation with geographical implications.

BIOLOGY. Adults have been commonly collected from Helianthus spp., Solidago spp., Gutierrezia sarothrae and Salsola kali. Whether females were feeding on secretions from these plants or were attracted to the plants because they were serving as hosts for cressoni prey has not been established. M. cressoni has been commonly collected in southern Idaho from Salsola

kali, a known host of the beet leafhopper (Circulifer tenellus (Baker)) so that attraction to a plant in search of prey is a possibility which should not be overlooked. That cressoni is commonly found in Idaho in areas of beet leafhopper abundance has been established. However, no observations are known to have been made which would confirm the suspicion that the beet leafhopper serves as a prey of M. cressoni.

Mimesa basirufa Packard

Mimesa basirufa Packard, 1867:406 (female); Viereck 1901:342
Psen basirufus, Fox 1898:17 (male)
Psen (Mimesa) basirufus, Malloch 1933:32
Mimesa (Mimesa) basirufa, Krombein 1951:960
Mimesa nebrascensis Smith 1908:390 (female); Malloch 1933:32 (synonymy)

DESCRIPTION. Female. Length averaging 8.5 mm. Black; much of tarsi, undersides of antennal flagella, tegulae, first, second and third abdominal tergites and second and third abdominal sternites; red to yellow. Wings hyaline, stigma and veins dark brown. Pubescence silvery.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus finely punctate, commonly with a subapical transverse tumidity, apex distinctly and roundly emarginate medially; lower frons with a well-developed tubercle between the lower margins of antennal insertions; upper

frons closely punctate to striato-punctate medially beneath ocellar area; vertex punctate, without a postocellar tumidity or furrow; gena reflexed near lower eye level above which are few fine striations, lower gena shiny, at most sparsely punctate; occipital carina distinct, becoming weak to evanescent immediately before juncture with the hypostomal carina; antenna with first flagellar segment only slightly longer than second flagellar segment, width of last flagellar segment at base equal to width of scape.

Thorax. Pronotum normal. Mesoscutum strongly punctate, anteriorly dull, more shiny posteriorly; notaulices distinct anteriorly; parapsidal lines present; mesoscutellum very shiny, at most only moderately punctate; postscutellum with surface irregular; mesopleuron with anepisternal area moderately striate, katepisternal area chagreened, finely striato-punctate to striate posteriorly; propodeum with lateral spheres slightly elevated from dorsal area, dorsal area with distinct, parallel striations, lateral spheres coarsely rugose-reticulate, enclosure narrow, flanked by carinae, extreme lateral areas mostly chagreened; hind coxa approximately twice as long as hind trochanter and lacking a complete longitudinal ventral carina.

Abdomen. Petiole wide, flat to concave above, with dorso-lateral carinae, dorsal area chagreened at least

anteriorly; ratio of length of petiole to first abdominal tergite to hind femur -- 4:5:6; first abdominal tergite only weakly elevated above petiole; pygidium broad, delimited by a well-developed carina, and with deep, closely set, elongate punctations throughout.

Male. Length averaging 8 mm. Characters similar to female generally with following exceptions: first abdominal tergite infrequently, partly dark; clypeal apex simply notched and lacking a subapical tumidity; antennae with flagellar segments two to seven bearing well-developed, broad, elongate tyloides (less pronounced on seventh segment); mesopleuron with katepisternal area more irregularly striate; propodeum more coarsely ornamented, dorsal area irregularly striate medially; petiole narrower, more elongate; no delimited pygidial area.

TYPE. Holotype, female, "Maine" (Harris) (Philadelphia Academy of Sciences); allotype, not designated.

DISTRIBUTION. Transcontinental, but most common in northern United States and southern Canada.

MATERIAL EXAMINED. BRITISH COLUMBIA: Quesnel, June 19, 1949 (G. J. Spencer) (1 female).

ALBERTA: Wabamun, June 14-28, 1936 (E. H. Strickland) (8 males); Edmonton, June 25, 1937 (E. H. Strickland) (4

males), (F. O. Morrison) (4 males).

SASKATCHEWAN: Parkberg, June 22, 1959 (A. R. Gittins) (1 male).

ALASKA: Matanuska, June 27, 1944 and June 20, 1945 (J. C. Chamberlin) (2 females).

WASHINGTON: Nehcotea, Aug. 3, 1952 (1 female); Mt. Rainier, July 26, 1931 (D. Denning) (1 female, 2 males).

IDAHO: Idaho City, Aug. 9, 1957 (M. M. Furniss) (1 female); Bear Creek Pass, July 9, 1947 (R. M. Bohart) (1 female); 23 mi. s. Avery, June 12, 1958 (A. R. Gittins) (1 male).

CALIFORNIA: Independence Lake, July 20, 1954 (J. A. Powell) (1 male); Cottonwood Creek, July 14, 1953, on Ranunculus californicus (J. W. MacSwain) (1 male); Red Lake, July 25, 1955 (E. I. Schlinger) (1 male).

COLORADO: "Colorado" (1 female); "Colorado" No. 1563 (Baker) (1 female); Boulder Canyon, Aug. 8, 1960 (R. & K. Dreisbach) (1 female).

MONTANA: "Montana" (1 male).

MINNESOTA: Grand Rapids, July 7, 1935 (Mickel-Telford) (4 males); Floodwood, July 2, 1935 (D. Denning) (1 female).

MICHIGAN: Marquette Co., June 20, 1955 (R. R. Dreisbach) (1 female, 5 males); Alger Co., June 26, 1952 (R. R. Dreisbach) (1 female); Schoolcraft Co., June 18, 1955 (R. R. Dreisbach) (2 males); Ontonogan Co., Aug. 25, 1959 (R. &

K. Dreisbach) (1 female); Pequaming, July 14, 1903 (M. Hebard) (1 female); Mackinac Co., July 4, 1955 (R. R. Dreisbach) (1 female).

CONNECTICUT: East Hartford, Sept. 4, 1947 (H. E. Evans) (1 female).

DIAGNOSIS. This species is distinctive in that the petiole is more robust in form than in other species of the genus. Members of basirufa are readily distinguished by the flattened character of the petiole, red coloration of the first abdominal tergite, rugose condition of the propodeum, emargination of the clypeal apex, and commonly the presence of a subapical tumid area on the clypeus of the female.

DISCUSSION. Like many of the species of Mimesa which occur in the western nearctic region, basirufa shows considerable variation in color and anatomical features. Unfortunately, Packard's type was not available for study so I have utilized Fox's redescriptions and identified material for comparison. Western specimens of this species compare well with Fox's descriptions. However, most specimens I have examined possess a subapical tumidity on the clypeus of females, a feature not mentioned by Fox. Additionally, western specimens exhibit variation of the apex of the clypeus, ranging from a near truncate condition to one that suggests similarity to that found in ezra. Until further studies which might

indicate change, I consider these modifications of structure to be of an intra-specific nature.

I have examined the holotype of nebrascensis and find it agrees moderately well with my species concept of basirufa. Admittedly the near truncate condition of the clypeal apex, more finely sculptured mesopleuron and somewhat convex nature of the dorsum surface of the petiole raise some question regarding the validity of synonymizing nebrascensis with basirufa. However, because of the variable nature of basirufa, I prefer to consider this synonymy valid.

BIOLOGY. Little is known of the habits of this species. Krombein (1958) reports capturing a female with her prey at Plummers Island, Maryland, on June 11, 1957. The prey was tentatively identified as a fourth-instar nymph of Idiocerus sp.

Mimesa pygidialis (Malloch)

Psen (Mimesa) pygidialis Malloch 1933:39-40 (male and female)
Mimesa (Mimesa) pygidialis, Krombein 1951:961

DESCRIPTION. Female. Length averaging 10.5 mm. Black; tegulae amber, undersides of antennal flagella except basal segment broadly testaceous-yellow, commonly first abdominal tergite, second and third abdominal segments red, variable portions of legs fuscous (commonly colored as in pauper).

Wings hyaline, stigma and veins dark brown. Pubescence silvery.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus finely punctate, with a transverse subapical tumidity, apex varying from nearly truncate (as in allotype) to dentate; lower frons with a well-developed tubercle between lower margins of antennal insertions; upper frons mostly evenly punctate; vertex shiny, punctate, without a postocellar tumidity or furrow; gena reflexed near lower eye level, upper gena distinctly striate, lower gena at most finely punctate; occipital carina distinct to juncture with hypostomal carina; antenna with first flagellar segment nearly twice as long as second flagellar segment, width of last flagellar segment at base equal to width of scape.

Thorax. Pronotum normal; mesoscutum finely, indistinctly punctate and chagreened; notaulices indistinctly evident anteriorly; parapsidal lines commonly indistinct; mesoscutellum very shiny, sparsely punctate and not chagreened; postscutellum with surface dull and irregular; mesoepisternum with anepisternal area mostly granular, uncommonly with distinctive striations, katepisternum finely punctate and chagreened, variably, finely striate posteriorly; propodeum with lateral spheres not elevated from medial portion of dorsal area, dorsal area with some irregular striations, lateral spheres commonly finely striate and chagreened (partially

reticulate in some forms), enclosure deep, not flanked by distinct carinae, extreme lateral areas mostly chagreened; hind coxa approximately twice as long as hind trochanter, and lacking a complete longitudinal ventral carina.

Abdomen. Petiole usually slightly convex above, dorsolateral carinae distinct throughout length of petiole; ratio of length of petiole to first abdominal tergite to hind femur -- 6:5:7; first abdominal tergite at most only moderately elevated above petiole; pygidium broad, delimited by a well-developed carina and covered with deep, closely set punctations.

Male. Length averaging approximately 9.5 - 10 mm., differing from female in following respects: clypeus and lower frons more densely pubescent, clypeus without a subapical clypeal tumidity, apex centrally notched; upper frons less evenly but commonly more strongly punctate; vertex frequently with some fine striations; antennal flagellum with oblique, rounded tyloides on second, third and fourth segments; petiole slightly longer than in female with dorsal area medially convex forming weakly evident, lateral sulci; sixth abdominal tergite with posterior one-quarter laterally carinate so that tergite appears pygidiform.

TYPES. Holotype, male, Bilby, Alberta, June 28, 1924 (O. Bryant) (U. S. National Museum, No. 49906); allotype: female,

Bilby, Alberta, June 28, 1924 (O. Bryant) (U. S. National Museum).

DISTRIBUTION. Michigan, west to Alberta and Colorado.

MATERIAL EXAMINED. ALBERTA: Bilby, July 20-28, Aug. 10, 1924 (O. Bryant) (2 males, 2 females); Wabamun, July 31, Aug. 2, 1929 (E. H. Strickland) (3 females); Gull Lake, June 24, 1932 (E. H. Strickland) (2 females); Edmonton, Aug. 1, 1930 (O. Peck) (1 male).

MINNESOTA: St. Anthony Park, Ramsey Co., Sept. 14, 1924 (Walter Carter) (2 males); Wahkon, Aug. 21, 1925 (O. A. Stevens) (1 female); Kittson Co., July 22, 1936 (D. G. Denning) (3 males).

DIAGNOSIS. This species is readily distinguishable in the males by the presence of a distinct carina around the apex of the sixth abdominal tergite which is continued forward laterally for approximately one-fourth of the length of the tergite, resulting in a marked resemblance to the female pygidium. Females may be identified by the following combination of characters: presence on the clypeus of a subapical tumidity; completeness of the occipital carina to its juncture with the hypostomal carina; finely ornamented condition of the meso-anepisternum; and the characteristic features of form of propodeum and petiole.

DISCUSSION. This species belongs to a group which includes coquilletti, ezra and basirufa and appears to be most closely related to the latter two species. While members of pygidialis are nearly always distinctive, variability of external anatomical features in the female do occasionally create difficulties in determining the species affinity of those specimens.

The species is northern in its distribution and I believe it to have evolved from a basic basirufa "stock."

BIOLOGY. Nothing is known on the biology of this species.

Mimesa sabina new sp.

DESCRIPTION. Female. Length averaging 8 mm. Black; tegulae, undersides of antennal flagella, much of fore tarsi, inner portion of fore tibiae, apex of first abdominal sternite, all of second, third and fourth abdominal sternites, and first, second and third abdominal tergites, red. Wings hyaline, stigma and veins dark brown. Pubescence silvery, dense on frons and clypeus.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus shiny, moderately punctate, apex strongly emarginate medially with emargination flanked by a pair of well-developed teeth, laterad of which there is a second pair of less well-developed teeth, and with a

prominent subapical tubercle; lower frons moderately shiny, finely but densely punctate, appearing granulate under low magnification, with a well-developed tubercle between the lower margins of antennal insertions; upper frons closely but finely punctate medially, with a fine, incomplete, longitudinal facial carina below median ocellus; vertex moderately shiny, moderately punctate, chagreened, never striate, without a postocellar tumidity or furrow; gena reflexed near lower eye, upper gena moderately punctate, lower gena densely chagreened; occipital carina terminating shortly before juncture with hypostomal carina; antenna with first flagellar segment approximately one and one-third times as long as second flagellar segment; width of last flagellar segment at base equal to width of scape.

Thorax. Pronotum normal but with dorso-lateral angles slightly extended; mesoscutum shiny, lightly punctate with widely separated punctations, chagreened at least anteriorly; notaulices distinct anteriorly; parapsidal lines distinct; mesoscutellum bright and shiny, nearly impunctate; postscutellum normal; mesoepisternum with anepisternal area noticeably striate, katepisternal area densely chagreened, finely punctate particularly along posterior margin; propodeum with lateral spheres elevated from dorsal area, separated by an irregular carina, dorsal area with longitudinal carinae laterally, becoming almost reticulate medially, lateral

spheres mostly rugose-reticulate, nearly smooth near enclosure, striate laterally and smooth and shiny along extreme lateral margins; enclosure deep and narrow; hind coxa approximately twice as long as hind trochanter and bearing only a fine incomplete longitudinal ventral carina.

Abdomen. Petiole distinctly convex above, somewhat flattened apically, dorsal surface shiny, dorso-lateral carinae distinct; ratio of length of petiole to first abdominal tergite to hind femur -- 7:6:8; first abdominal tergite moderately elevated above petiole; pygidium broad, delimited by a well-developed carina, and with deep, closely set, elongate punctations, less pronounced along anterio-lateral margins, becoming more densely piliferous apically and with some indication of integumental reddening apically.

Male. Length averaging 7 mm. Characters similar to female generally but differing in following respects: black, but with greater degree of red on legs, particularly on fore tibiae; silvery pubescence generally heavier on clypeus and lower frons; apex of clypeus notched medially; antenna with indistinct linear tyloides present on flagellar segments two through five; propodeum more rugose on lateral spheres, extending medially to enclosure; no delimited pygidial area.

TYPES. Holotype, female, Davis, California, Oct. 8, 1959 (L. A. Stange) (University of California, Davis, California);

allotype, male, Davis, California, Oct. 8, 1959 (F. D. Parker) (University of California, Davis, California). Paratypes: 2 females, 3 males, Sept. 27, 1959, 34 females, 1 male, Oct. 8, 1959, 9 females, Oct. 17, 1959 (F. D. Parker), 2 females, 1 male, Oct. 8, 1959 (L. A. Stange), 1 female, Oct. 19, 1957 (R. E. Rice), 1 male, May 28, 1950 (R. C. Bechtel), and 1 male, Sept. 27, 1952 (J. C. Hall), all from Davis, California; 1 male, Sept. 25, 1958 (J. Powell), Antioch, Contra Costa Co., California.

DISTRIBUTION. Apparently restricted to the southern portion of California.

DIAGNOSIS. Males and females can be readily recognized by the entirely red first abdominal tergite, noticeable convexity of the dorsal surface of the petiole, impunctate condition of the meso-katepisternum, and the smooth shiny condition of the lateral margins of the propodeum.

DISCUSSION. This is a new species which to date appears to have a fairly restricted distribution. This species appears to be most closely related to basirufa since a strong similarity exists between the two in the ornamentation on the clypeus and the general color and form of the petiole. It is possible that sabina is a displacement of basirufa in southern California. Additionally, there is a similarity in

form and structure of the clypeus between the females of sabina and those of coquilletti. I believe that these three species have probably evolved from a common stock within the genus Mimesa.

BIOLOGY. Unknown with the exception of a reference to an association with Philanthus as indicated on a label accompanying the paratype specimen collected by J. Powell. Interpreting this label, it appears possible that the specimen served as prey for the Philanthus wasp.

Mimesa barri new sp.

DESCRIPTION. Female. Length averaging 8 mm. Black; much of antennae, tarsi, fore tibiae, tegulae, posterior portion of first abdominal tergite, second tergite, portion of third tergite, second and third abdominal sternites, yellow to red. Wings hyaline, stigma dark, veins mostly brown, becoming fuscous proximally. Pubescence silvery.

Head. Quadrate, slightly wider (including compound eyes) than long; clypeus shiny, granulate, with a faint, elongate, transverse subapical tumid area, apex nearly truncate with slight medial indentation; lower frons with only moderately developed tubercle between the bases of the antennal insertions; upper frons finely but closely punctate; vertex shiny, moderately but finely punctate, except striate

laterally, without a postocellar tumidity or furrow; gena shiny, reflexed near lower eye margin, upper gena distinctly striate, lower gena mostly punctate; occipital carina distinct except for a very narrow distance immediately before juncture with hypostomal carina; antennae with first flagellar segment only slightly longer than second flagellar segment, width of last flagellar segment at base at least equal to width of scape.

Thorax. Pronotum normal; mesoscutum moderately shiny, moderately punctate; notaulices indistinct; parapsidal lines distinct; mesoscutellum more shiny than mesoscutum, sparingly punctate; postscutellum moderately shiny, otherwise as in coquilletti; mesoepisternum entirely chagreened, finely striate on anepisternal and katepisternal areas; propodeum with lateral spheres elevated and separated from dorsal area by carinae; dorsal area irregularly striate, lateral spheres chagreened, striate anteriorly, rugose-reticulate centrally, mostly chagreened on extreme lateral areas; enclosure narrow and deep; hind coxa about twice as long as hind trochanter, and with a nearly complete, longitudinal, ventral carina.

Abdomen. Petiole short and broad, flattened above particularly posteriorly, dorso-lateral and ventro-lateral carina distinct, dorsal surface irregularly chagreened to finely granulate; ratio of length of petiole to first abdominal tergite to hind femur -- 2:4:4; first abdominal

tergite well-elevated above petiole; pygidium very narrow, width about one-third width of sixth tergite at pygidial base, delimited by a well-developed carina, mostly covered with dense, fuscous, bristle-like pile, otherwise dull and finely granulate, without orange markings.

Male. Length averaging 6.5 mm. Characters similar to female generally but differing in the following respects: legs colored much as in pauper; abdomen with red markings frequently confined to posterior margin of first tergite and all of second abdominal segment; antenna similar to female, lacking distinct tyloides.

TYPES. Holotype, female, Squaw Creek, 4 mi. east Emmett, Gem Co., Idaho, July 7, 1952 (on Grindelia sp.) (W. F. Barr) (University of Idaho); allotype, male, (same data as holotype) (University of Idaho). Paratypes: 4 females (same data as holotype); 1 female, 3 mi. s. w. Sweet, Gem Co., Idaho, July 3, 1956 (on Grindelia sp.) (W. F. Barr); 1 female, 2 males, 12 mi. n. w. Regina, Ada Co., Idaho, July 11, 1952 (on Helianthus sp.) (W. F. Barr); 1 female, 7 mi. n. Bliss, Gooding Co., Idaho, June 10, 1956 (R. C. Newton); 1 female, Corvallis, Ore., Aug. 7, 1941 (on wild carrot) (R. E. Rider); 1 female, 1 male, Rumsey, Yolo Co., Calif., May 17, 1958 (A. E. Menke); 1 female, Pt. Reyes St., Marin Co., Calif., July 11, 1958 (S. M. Fidel); 1 female, Berkeley,

Alameda Co., Calif., July 27, 1910 (J. C. Bridwell); 1 male, Vacaville, Calif., Sept. 27, 1930.

DISTRIBUTION. Northern California, Oregon, southwestern Idaho.

DIAGNOSIS. This species bears some similarity to gregaria. The females are immediately distinguished by the very narrow pygidium, extremely short petiole and the uniformly striate condition of the mesoepisternum. The males are distinguished by the extremely short, broad petiole and the uniformly striate condition of the mesoepisternum.

DISCUSSION. I take deep pleasure in naming this species after my colleague, Dr. Wm. F. Barr. Members of this previously undescribed species vie with those of cressoni and dawsoni in their divergence anatomically from the basic North American stock of Mimesa. M. barri bears closest resemblance to agalena and is probably a more northerly displacement of the latter. Unlike so many other western North American forms of Mimesa, this species is quite distinctive.

BIOLOGY. Unknown, except that females are known to visit the flowers of Grindelia sp., Helianthus sp. and Daucus sp.

Mimesa agalena new sp.

DESCRIPTION. Female. Length averaging 7 mm. Black; undersides of antennae, tegulae, tarsi, femora-tibial joints, posterior margin of first abdominal tergite, all of second tergite and sternite, variable portions of third sternite and tergite, and medial portion of pygidium, red to yellow. Wings hyaline, stigma and veins dark brown. Pubescence silvery.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus finely punctate, apex truncate, slightly protuberent, with an elongated subapical transverse depression; lower frons with a slight tubercle, much less pronounced than in other species of the genus, between the lower margins of the antennal insertions, upper frons punctate to slightly striato-punctate mesally above antennal insertions; vertex shiny, tending toward striato-punctate, particularly laterally, without a postocellar tumidity or furrow; gena shiny, reflexed near lower eye margin, upper gena generally striate, lower gena commonly sparsely punctate and lightly chagreened; occipital carina evanescent immediately prior to its juncture with the hypostomal carina; antenna with first flagellar segment little if any longer than second flagellar segment, width of last flagellar segment greater at base than width of scape.

Thorax. Pronotum normal; mesoscutum moderately to densely punctate, moderately shiny; notaulices indistinct; parapsidal lines not prominent; mesoscutellum shiny, more sparsely punctate than mesoscutum, postscutellum appearing nearly granular at least mesally; mesoepisternum finely striate throughout; propodeum with lateral spheres slightly elevated from dorsal area, sometimes separated from dorsal area by carinae, dorsal area traversed by distinct striations, frequently with striations continuing onto lateral spheres, lateral spheres finely rugose-reticulate or striate throughout, enclosure narrow, deep anteriorly, not flanked by carinae, extreme lateral areas striate, strongly chagreened; hind coxa about twice as long as hind trochanter, with an indistinct, incomplete, longitudinal ventral carina.

Abdomen. Petiole slightly convex above, square in outline, with dorso-lateral carinae, dorsal surface irregular; ratio of length of petiole to first abdominal tergite to hind femur -- 1.5:4.5:4; pygidium extremely narrow, width about one-third width of sixth tergite at pygidial base, delimited by a well-developed carina, covered at least mesally with a dense orange-colored pile, basal portion coarsely granulate.

Male. Length averaging 5 mm. Characters similar to female generally but differing in following respects: coloration generally much darker than female, considerably less integumental red or yellow, particularly on abdomen;

clypeus with apex broadly truncate, generally lacking a transverse subapical depression; antenna darker with large, well-developed, rounded tyloides, present on flagellar segments two to six; mesopleuron more coarsely striate; propodeum more coarsely striate on dorsal area, more granulate on lateral spheres.

TYPES. Holotype, female, Jamestown, Tuolumne Co., California, April 26, 1951 (P. D. Hurd) (University of California, Davis, California); allotype, male, Davis, California, June 5, 1949 (E. I. Schlinger) (University of California, Davis, California). Paratypes: all from California; 3 females, 8 males, April 17, May 20, June 5 and Aug. 3, 1949, and 1 male, April 30, 1948 (E. I. Schlinger) all from Davis; 1 female, Arroyo Seco Camp, Monterey Co., May 1, 1960 (F. D. Parker); 1 female, Tesla, Alameda Co., March 22, 1953 (J. G. Rozen); 1 female, Arroyo del Valle, Alameda Co., April 30, 1958 (R. M. Bohart); 1 female, 4 mi. e. Sonora, Tuolumne Co., May 22, 1953 (J. G. Rozen); 1 male, Riverside Co., April 19, 1960 (J. C. Hall); 1 male, Saugus, April 13, 1939 (on Cryptantha) (R. M. Bohart); 1 female, May 30, 1953, 1 female and 1 male, May 12-13, 1955, 1 male, May 22, 1956 (E. I. Schlinger), 1 female, May 16, 1957 (R. C. Bechtel), 2 females, May 22, 1956 (J. C. Hall and E. I. Schlinger), 1 male, May 16, 1917 (R. C. Bechtel), 3 males, May 9, 1955 and 1 male, May 13, 1956 (R.

M. Bohart), all from Samuel Springs, Napa Co.

DISTRIBUTION. California.

DIAGNOSIS. This species is immediately distinguished from all others of the genus, except barri, by the extreme, short, squared petiole. It differs from barri in smaller size, and more finely ornamented mesopleuron and propodeum. Males additionally differ from those of barri with the general presence of tyloides on flagellar segments two to six.

DISCUSSION. This species bears a closer relationship to barri than to any other taxon within the genus, and is possibly, in part, a southern displacement of the more northern barri.

BIOLOGY. Nothing is known on the habits of members of this species other than a floral visitation record from Cryptantha sp.

Mimesa maculipes Fox

Mimesa maculipes Fox 1893:117 (male); Viereck 1901:342
Psen maculipes, Fox 1898:17 (female)
Psen (Mimesa) maculipes, Malloch 1933:43-44
Mimesa (Mimesa) maculipes, Krombein 1951:960
Psen (Mimesa) nigrescens Rohwer 1910:168; Malloch, 1933:43 (synonymy)
Psen (Mimesa) perplexa Rohwer 1910:169; Malloch 1933:43 (synonymy)

DESCRIPTION. Female. Average length 8 mm. Black; undersides of antennal flagella fulvous-yellow; tegulae, variable portions of legs, red. Wings hyaline, veins dark brown except lighter proximally, stigma uniformly dark brown. Pubescence silvery (golden on face of some forms).

Head. Rectangular, distinctly wider (including compound eyes) than long; clypeus with fine, close punctations partially obscured by pile, with a broad, weakly elevated subapical tubercle, apex medially emarginate, flanked by a pair of rounded dentations, with a second pair of angulate dentations laterad; lower frons with a well-developed tubercle between lower margins of antennal insertions; upper frons densely punctate, approaching striato-punctate beneath and immediately lateral of median ocellus, shiny and much more sparsely punctate above; vertex shiny, very sparingly punctate, without a postocellar tumidity or furrow; gena weakly reflexed near lower eye level, upper gena with distinct striations, lower gena lightly and partly chagreened; occipital carina distinct to juncture with hypostomal carina; antenna with first flagellar segment one and one-half times as long as second flagellar segment, last flagellar segment wider at base than width of scape.

Thorax. Pronotum normal; mesoscutum glossy, partly, finely chagreened, sparingly punctate; notaulices distinct anteriorly; parapsidal lines distinct; mesoscutellum glossy,

sparsely punctate, not chagreened; postscutellum granular, dull, evenly, moderately hirsute; mesoepisternum with anepisternal area strongly striate, katepisternal area glossy with few, widely-spaced, fine punctations; propodeum with lateral spheres highly elevated from dorsal area and separated from dorsal area by high carinae present at least medioanteriorly, dorsal area shiny, traversed by cristate, oblique, parallel striations, lateral spheres shiny, mostly rugose-reticulate; enclosure deep and narrow, bounded by a rugose-reticulate area, extreme lateral areas chagreened anteriorly, with a few strong striations posteriorly; hind coxa about twice as long as hind trochanter and with longitudinal ventral carina along, at most, basal half of coxa.

Abdomen. Petiole shiny, highly convex above, with dorsolateral sulci and carinae; ratio of length of petiole to first abdominal tergite to hind femur -- 3:5:4.5; first abdominal tergite moderately abruptly elevated above petiole; pygidium of moderate width, delimited by a strong carina, appearing granular and strongly striato-punctate throughout.

Male. Differing from female in the following respects: clypeus more densely punctate, apical margin commonly widely emarginate, otherwise rounded; antenna with tyloides, elongate-oval in form, black or fulvous, present on flagellar segments two to six or seven; no delimited pygidial area.

TYPES. Of maculipes: holotype, male, "South Florida" (Chas. Robertson) (Philadelphia Academy of Sciences); allotype, not designated. Of nigrescens: holotype, male, Clemonton, New Jersey, June 30, 1908 (U. S. National Museum, No. 12858); allotype, not designated. Of perplexa: holotype, female, Camden Co., New Jersey, Aug. 6, 1890 (W. J. Fox) (U. S. National Museum, No. 12859); allotype, not designated.

DISTRIBUTION. Eastern North America, Ontario to Florida, west to Michigan.

MATERIAL EXAMINED. ONTARIO: Chatterton, June 6-13, 1941 (W. Wellington) (3 males).

MICHIGAN: Lake Co., July 7, 1957 (R. & K. Dreisbach) (1 male); Grand Traverse Co., Aug. 9, 1960 (R. & K. Dreisbach) (1 female).

MASSACHUSETTS: Woods Hole (1 male).

DIAGNOSIS. The entirely black coloration of the abdomen, contrasting striate condition of the meso-anepisternal area with the nearly smooth and glossy meso-katepisternal area, extreme rugose-reticulate condition of the lateral spheres of the propodeum, and pronounced convexity of the dorsal surface of the petiole, serves to distinguish maculipes from its allies.

DISCUSSION. This species has some anatomical features which

are more commonly found in the genus Mimumesa, causing me to agree with Malloch who stated that maculipes is the most divergent of the North American forms of Mimesa and probably represents an early off-shoot of the Mimesa phyletic line.

An examination of Rohwer's male holotype of nigrescens and female holotype of perplexa leaves little doubt of the validity of their synonymy under maculipes. Rohwer himself states, "The female of maculipes Fox is undescribed, and perplexa is very like what we may expect this female to be, yet there are so many differences that perplexa seems distinct from the Florida species." Rohwer over-exaggerated the "so many differences" which seem nothing more than the normal sexually dimorphic variations one might expect.

BIOLOGY. Nothing is known concerning the habits or biology of this species.

Mimesa granulosa (Fox)

Psen granulosus Fox, 1898:15 (male)
Psen (Mimesa) granulosus, Malloch 1933:33-34
Mimesa (Mimesa) granulosa, Krombein 1951:960

DESCRIPTION. Female. Not known.

Male. Length averaging 8 mm. Black; undersides of antennae, tegulae, fore and mid tarsi, portions of hind tarsi, much of fore tibiae, yellow. Wings hyaline, stigma

dark brown with proximal light brown marking, veins light brown, coxa usually whitish. Pubescence silvery, most dense on face.

Head. Quadrate, very slightly wider (including compound eyes) than long; clypeus strongly punctate, without a subapical tumidity, apex with medial notch; lower frons moderately punctate with a well-developed tubercle between lower margins of antennal insertions; upper frons punctate, more densely so about median ocellus; vertex at most moderately shiny, strongly and closely punctate and chagreened, never distinctly striate laterally, without a postocellar tumidity or furrow; gena reflexed near lower eye level, upper gena striate below and granulate to chagreened on upper part, lower gena impunctate and shiny; occipital carina complete to its juncture with hypostomal carina; antenna with first flagellar segment approximately one and one-half times as long as second flagellar segment, last flagellar segment about as wide at base as scape, flagellum without noticeable tyloides.

Thorax. Pronotum normal; mesoscutum shiny, chagreened at least anteriorly, only sparingly punctate; notaulices indistinct; parapsidal furrows distinct; mesoscutellum shiny, lightly chagreened, nearly impunctate; postscutellum normal; mesoepisternum with anepisternal area striato-punctate, katepisternal area deeply punctate, becoming striato-punctate

dorsally and posteriorly; propodeum with lateral spheres slightly elevated above dorsal area, not separated by carinae, dorsal area granulate, striate laterally to finely reticulate medially, lateral spheres mostly granulate, finely rugose-reticulate, enclosure narrow and deep, not flanked by carinae, extreme lateral areas coarsely granulate; hind coxa about twice as long as hind trochanter and with a nearly complete, longitudinal ventral carina.

Abdomen. Petiole slightly convex above, with well-developed dorso-lateral carinae, dorsal surface shiny; ratio of length of petiole to first abdominal tergite to hind femur -- 4.5:6:8; first abdominal tergite only weakly elevated above petiole; second, third and fourth abdominal tergites at least as long as broad; no delimited pygidial area.

TYPE. Holotype, male, "Montana" (Philadelphia Academy of Sciences); allotype, not designated.

DISTRIBUTION. Northern United States from South Dakota to Washington and south in Rocky Mountains to New Mexico.

MATERIAL EXAMINED. IDAHO: East Idaho, June 9, 1931 (on beets) (D. Fox). (2 males).

WASHINGTON. Lind, June 11, 1919 (F. W. Carlson) (1 male); Connell, July, 1917 (F. W. Carlson) (1 male).

WYOMING: South Pass (elevation 8,000'), July 13, 1955 (on Phacelia) (G. E. Bohart) (1 male).

DIAGNOSIS. Males of this species can be easily recognized by the uniformly dark abdomen, elongate abdominal segments, and lack of tyloides on the antennal flagella.

DISCUSSION. Some of the anatomical features pointed out by Malloch relative to this species do not agree completely with the type. His reference to the carination of the hind coxae and his statements on the coloration of the veins are not correct, which leads me to believe that Malloch himself did not examine the type of the species.

I am presently unable to decide upon the phylogenetic position of this species within the genus, primarily because of lack of females.

BIOLOGY. Unknown.

Mimesa punctifrons (Malloch)

Psen (Mimesa) punctifrons Malloch 1933:36-37 (male)
Mimesa (Mimesa) punctifrons, Krombein 1951:961
Psen (Mimesa) edentatus Malloch 1933:37-38 (male); Krombein 1951:961. New Synonymy.
Psen (Mimesa) impressifrons Malloch 1933:38 (male); Krombein 1951:961. New Synonymy.

DESCRIPTION. Female. Length averaging 9 mm. Black; tegulae, apices of undersides of first flagellar segments and undersides

of succeeding flagellar segments, yellow; apex of first abdominal tergite and all of second and third abdominal segments, red; tarsi, fore and mid tibiae often fuscous to yellowish-brown. Wings hyaline, stigma and veins dark brown. Pubescence silvery.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus shiny, mostly with widely spaced piliferous punctures, granulate laterally, apex as in sabina, with a distinct subapical transverse tubercle; lower frons finely and densely punctate, with a well-developed tubercle between the lower margins of antennal insertions; upper frons compactly punctate; vertex mostly moderately punctate, infrequently with a postocellar tumidity and furrow; gena reflexed near lower eye margin, finely striate along mid-portion, lower gena smooth and shiny, upper gena finely punctate; occipital carina distinct except for a very narrow distance before juncture with hypostomal carina; antenna with first flagellar segment slightly less than one and one-half times as long as second flagellar segment, width of last flagellar segment at base greater than width of scape.

Thorax. Pronotum with lateral angles distinctly extended into spur-like processes, anterior of which is a series of parallel but posteriorly converging carinae; mesoscutum dull, densely chagreened, with scattered punctations; notaulices distinct anteriorly; parapsidal lines

distinct; mesoscutellum much shinier than mesoscutum, nearly impunctate except along posterior margin; postscutellum moderately pubescent, with fine irregularities; mesoepisternum shiny with anepisternal area striate, katepisternum mostly chagreened with a few widely scattered punctations, finely striate along posterior margin; propodeum with lateral spheres moderately elevated from dorsal area, separated at least medially by an irregular carina, dorsal area with a series of longitudinally, parallel striations laterally, more reticulate medially, lateral spheres rugose-reticulate, enclosure narrow, deep, not flanked by carinae, extreme lateral areas moderately shiny and chagreened with some striations along posterio-lateral margins; hind coxa approximately twice as long as hind trochanter, and with a fine, longitudinal ventral carina restricted to the proximal half of coxa.

Abdomen. Petiole convex above, commonly with dorso-lateral carinae present, dorsal surface mostly smooth and shiny; ratio of length of petiole to first abdominal tergite to hind femur = 6:4.5:6.5; pygidium broad, delimited by a well-developed carina, striato-punctate, less so but more chagreened basally, frequently subapically reddened.

Male. Length averaging 7 to 8 mm. Similar to female generally but differing in the following respects: tarsi and frequently fore tibiae red; yellow coloration on antenna occasionally greatly reduced; clypeus and lower frons

frequently more densely pubescent; apex of clypeus distinctly notched (not evenly rounded as Malloch states); vertex striate, at least laterally; antennal flagellum with tyloides linear, visible on flagellar segments two to five; no delimited pygidial area.

TYPES. Of punctifrons: holotype, male, Redlands, California (F. R. Cole) (U. S. National Museum, No. 44215); allotype, not designated. Of edentatus: holotype, male, San Diego Co., California, April (Coquillett) (U. S. National Museum, No. 44216); allotype, not designated. Of impressifrons: male, Perry, Washington, Aug. 27, 1922 (M. C. Lane) (U. S. National Museum, No. 44217); allotype, not designated.

DISTRIBUTION. California to Washington and Nevada.

MATERIAL EXAMINED. CALIFORNIA: Goleta, Santa Barbara Co., June 25-27, 1959 (R. M. Bohart), July 2, 1959 (J. R. Russell) (5 females), June 22, 1959 (F. D. Parker, P. M. Marsh) (2 males); Sierraville, Sierra Co., July 9, 1954 (R. M. Bohart) (1 male); Stanford University, Sept. (W. M. Mann) (1 male).

NEVADA: Verdi, June 25, 1954 (R. M. Bohart) (1 male).

DIAGNOSIS. Members of this species can immediately be distinguished from their allies by the prominent spur-like projections of the lateral angles of the pronotum.

DISCUSSION. This is the first description of the female of this species originally described by Malloch in 1933 from 2 males collected at Redlands, California by F. R. Cole. From an examination of the females of punctifrons it appears probable that the species is most closely related to the coquilletti group which also includes the species basirufa and sabina.

My examination of the holotype of edentatus Malloch reveals that it differs from the punctifrons holotype only in the possession of a distinct postocellar tumidity. Whether the tumidity is an aberrent feature has yet to be determined. However, the variability of a post-ocellar tumidity in other species leads me to the conclusion that the holotypes of punctifrons and edentatus are conspecific. Much the same can be stated with regard to impressifrons and I have little doubt as to the validity of these synonymical assignments.

BIOLOGY. Nothing is known on the biology of this species.

Mimesa coquilletti (Rohwer)

Psen (Mimesa) coquilletti Rohwer 1910:103 (female); Malloch 1933:34
Mimesa (Mimesa) coquilletti, Krombein 1951:960

DESCRIPTION. Female. Length averaging 9 mm. Black; tegulae and undersides of antennal flagella, testaceous; tarsi and

variable portions of tibiae brown; apex of first abdominal tergite, abdominal segments two and three and frequently four, largely red. Wings hyaline, stigma brown but with a proximal pale spot, veins mostly brown, except generally whitish proximally, costal vein largely white for at least half its length from humeral base to pterastigma. Pubescence silvery.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus finely punctate and chagreened, with a large, prominent, triangular, subapical elevation, apex broadly truncate medially but with a distinct tooth on each side equidistant between one another and extreme lateral margins; lower frons with a well-developed tubercle between lower margins of antennal insertions; upper frons closely but finely punctate; vertex shiny, sparingly punctate, with a postocellar tumid area, without a postocellar furrow; gena reflexed abruptly near lower eye level above which are distinct striations, upper and lower gena mostly shiny and sparingly punctate; occipital carina distinct except for a very narrow distance before juncture with hypostomal carina; antenna with first flagellar segment approximately one and one-half times as long as second flagellar segment, width of last flagellar segment at base equal to width of scape.

Thorax. Pronotum normal; mesoscutum dull, densely chagreened, with widely spaced fine punctations; notaulices

distinct anteriorly; parapsidal lines distinct; mesoscutellum with few punctations, less densely chagreened than mesoscutum; postscutellum with surface dull and irregular, laterally with moderate numbers of long silvery hairs; mesoepisternum with anepisternal area chagreened to granular, frequently indistinctly, finely striate, katepisternum mostly chagreened; propodeum with lateral spheres only moderately elevated from dorsal area, both portions traversed by mostly continuous, obliquely angled, fine striations; enclosure deeply set, not flanked by carinae, extreme lateral areas mostly finely striate and chagreened; hind coxa approximately twice as long as hind trochanter, and with an indistinct but nearly complete longitudinal ventral carina.

Abdomen. Petiole convex above, with dorso-lateral carinae more distinct posteriorly, dorsal surface with chagreening at least anteriorly; ratio of length of petiole to first abdominal tergite to hind femur -- 3.5:4:5; first abdominal tergite only moderately elevated above petiole; pygidium broad, delimited by a well-developed carina, and covered with deep, closely set, elongate punctations, less pronounced along anterio-lateral margins, piliferous apically.

Male. Length averaging approximately 7.5 mm. Characters similar to female generally but differing in the following respects: clypeus with apex medially notched, lacking a well-developed subapical tubercle; occipital carina

complete to its juncture with hypostomal carinae; antennae without well-defined tyloides on flagellum, with first flagellar segment approximately one and one-quarter times as long as second flagellar segment; punctation of thorax commonly more roughly sculptured on both mesoepisternum and propodeum; pygidial area not delimited by a carina but with punctation of sixth abdominal tergite similar to pygidial punctation in female.

TYPE. Holotype, female, San Diego Co., California (U. S. National Museum, No. 12861); allotype, not designated.

DISTRIBUTION. California, Nevada.

MATERIAL EXAMINED. CALIFORNIA: Borrego Valley dunes, San Diego Co., April 18, 1957 (R. M. Bohart) (2 males), April 20, 1957 (R. C. Bechtel) (1 male); Borrego, April 1-2, 1953 (P. D. Hurd) (2 males); San Diego, Aug. 2-5, 1954 (H. E. & M. A. Evans) (2 females, 1 male); Anza River Co., July 3-8, 1956 (R. C. Bechtel) (3 females), July 3, 1956 (H. R. Moffitt) (1 female); Goleta, Santa Barbara Co., July 9-Aug. 20, 1959 (R. M. Bohart) (3 females), June 22-July 2, 1959 (F. D. Parker) (2 females, 1 male); Temecula, Riverside Co., June 9, 1956 (E. I Schlinger) (1 female), April 24, 1951 (W. J. Wall) (1 male); Mira Coma, Riverside Co., May 3, 1953 (J. C. Hall) (2 females); 5 mi. s. Hemet, Riverside Co., Oct. 24, 1956 (R.

M. Bohart) (1 male); Antioch, Contra Costa Co., July 8, 1954 (J. G. Rozen) (1 female), May 21-June 24, 1949 (P. D. Hurd) (1 female, 1 male), Sept. 10, 1947 (P. D. Hurd) (1 female, 1 male), June 24, 1959 (G. W. O'Brien) (1 female), May 24, 1949 (J. W. MacSwain) (1 female), June 8, 1933 (1 female), April 20-28, 1958 (J. Powell) (3 males), July 31, 1959 (J. Powell) (1 male), Aug. 14, 1952 (R. Schuster) (1 male), Aug. 22, 1952 (G. A. Marsh) (1 male), Aug. 15, 1954 (H. E. & M. A. Evans) (1 male); Davis, Yolo Co., Aug. 9, 1956 (J. Powell) (1 female); Sacramento, May 17, 1944 (C. A. Hamsher) (1 female); Kramer Hills, S. Berdo. Co., April 25, 1957 (G. I. Stage) (1 female), May 1, 1958 (R. Schuster) (1 female), May 1, 1953 (P. D. Hurd) (1 male); 4 mi. n. w. Cajon Jct., S. Berdo. Co., July 1, 1958 (E. I. Schlinger) (1 male); Rio Vista Co., July 19, 1950 (J. E. Gillaspy) (1 female); Foster Park, Ventura Co., July 1, 1959 (F. D. Parker) (1 female); Ventura Co., (J. R. Russell) (1 female); Pismo Beach, San Luis Obispo Co., Aug. 5, 1951 (W. D. Murray) (2 females); Black L. Cn., San Luis Obispo Co., Aug. 24, 1955 (R. M. Bohart) (1 male); Amedee, Lassen Co., July 4, 1947 (C. A. Hanson) (1 male); Taft, July 25, 1956 (T. R. Haig) (1 male); 8 mi. n. Liano, L. A. Co., July 2, 1958 (J. C. Hall) (1 male); Fresno, April 25, 1939 (Perez Simmons) (1 female).

NEVADA: Winnemucca, June 27, 1959 (T. R. Haig) (1 male, 1 female); 8 mi. s. Lovelock, June 1, 1958 (T. R. Haig)

(3 females, 2 males).

DIAGNOSIS. This species exhibits a greater-than-average sexual dimorphism for the genus Mimesa. Females of coquilletti can be readily distinguished from females of other species by the greatly elevated and angulate tubercle located medially and subapically on the clypeus. Males of coquilletti can be distinguished from other species of Mimesa by the notching of the clypeal apex, general alutaceous condition of the meso-anepisternum, the striate condition of the propodeum, and the white coloration of the costal vein in the forewing.

DISCUSSION. Rohwer in his original description confused the sexes, assigning males of another species to coquilletti. Malloch recognized this error during his revisional studies when he wrote, "The male which the describer associated with the type does not, I am sure, belong here ...." He concludes his remarks thus, "I leave these male specimens without a definite name, but consider that they belong to a species unknown to me in the female sex." Malloch, however, alluded to another association which I also consider incorrect. In his paper Malloch suggests the males of granulosus (Fox) to be actually the male sex of coquilletti, based apparently on the features of the mesoepisternum, propodeum and petiole, but failing to take into account color differences which are too

profound to be overlooked.

BIOLOGY. Apart from floral visitation records of Chrysothamnus paniculatus obtained by D. E. Fox at Glendale, Nevada, and Erigonum sp. obtained by R. M. Bohart at Borrego Valley, California, nothing is known on the biology of this species.

Mimesa ezra (Pate)

Mimesa argentifrons Cresson 1865:487 (male and female)
Psen argentifrons, Fox 1898:12
Psen (Mimesa) argentifrons, Malloch 1933:38-39
Psen ezra Pate, 1944:133 (new name for argentifrons Cresson 1865:487 not argentifrons Cresson 1865:152)
Mimesa (Mimesa) ezra, Krombein 1951:960

DESCRIPTION. Female. Length averaging 9 mm. Black; tegulae amber, undersides of antennal flagella yellow, variable portions of legs, apex of first abdominal tergite, all of abdominal segments two and three, reddish. Wings hyaline, stigma and veins dark brown. Pubescence silvery, especially dense on lower frons and clypeus.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus finely punctate, considerably obscured by dense pile, with a transverse subapical tumidity, apex notched medially, laterally dentate; lower frons with a well-developed tubercle between the lower margins of the

antennal insertions; upper frons finely but closely punctate; vertex punctate, never striate, without a postocellar furrow or tumidity; gena reflexed near lower eye margin, upper gena punctate, striate medially, lower gena shiny, with at most a few fine punctations; occipital carina distinct except for narrow distance before juncture with hypostomal carina; antenna with first flagellar segment approximately one and one-quarter times as long as second flagellar segment, width of last flagellar segment at base equal to width of scape.

Thorax. Pronotum normal; mesoscutum densely chagreened and finely punctate; notaulices distinct anteriorly; parapsidal lines distinct; mesoscutellum finely punctate and chagreened, more shiny than mesoscutum; postscutellum normal; mesopleuron with anepisternal area striate, katepisternal area mostly chagreened to finely punctate with some striations along posterior margin; propodeum as in basirufa; hind coxa approximately twice as long as hind trochanter and without a longitudinal ventral carina.

Abdomen. Petiole flattened above, dorso-lateral carinae distinct; dorsal surface shiny; ratio of length of petiole to first abdominal tergite to hind femur -- 7:4:5; first abdominal tergite only moderately elevated above petiole; pygidium broad, delimited by a well-developed carina and covered with strong, closely set, elongate punctations, striato-punctate near apex.

Male. Length averaging approximately 8 mm. Characters similar to female generally but differing in the following respects: clypeus with apex notched, without teeth or a subapical tumidity; upper frons and vertex commonly more strongly punctate; antennal flagellum with linear tyloides present on segments two to five; propodeum more coarsely ornamented; petiole not as flattened dorsally as in female; no delimited pygidial area.

TYPE. Holotype, female, "Colorado" (Baker) (Philadelphia Academy of Science); allotype, not designated.

DISTRIBUTION. Colorado, Kansas, Wisconsin, Washington.

MATERIAL EXAMINED. COLORADO: Glenwood Springs, Aug. 5, 1920 (1 male); Boulder Canyon, Aug. 8, 1960 (R. K. Dreisbach) (1 female, 1 male); "Colorado" (1 male).

DIAGNOSIS. As with many species of Mimesa specimens of ezra can be identified only after careful examination of a series of characteristics, the combination of which is exclusive to members of this taxon. Females can be recognized, therefore, by a combination of the dentate condition of the clypeal apex, presence of a subapical, clypeal tumidity, presence of dense silvery pile on the clypeus and lower frons, general rugose condition of the propodeum, the elongate, dorsally flattened petiole, and the presence of black coloration on the first

abdominal tergite. Males may generally be distinguished by similar characteristics of pubescence on the clypeus and lower frons, rugose condition of the propodeum, elongate nature of the petiole, and by the linear nature of the antennal tyloides on the second through fifth flagellar segments.

DISCUSSION. M. ezra appears most closely related to basirufa, particularly because of the similarity of characteristic features of the clypeus, propodeum and petiole. Indeed, many anatomical features are so similar between these two species that without the distinctive differences evident in the punctation and pubescence of the clypeus and frons, I would question the validity of taxonomic distinctness between the two.

The nomenclatorial problems involved in a discussion of this species are interesting. Cresson (1865) proposed the name argentifrons for two species he described as new. On page 152 he assigned this name to a species of Psen from Cuba. On page 487 of the same publication he assigned the name argentifrons to a species of Mimesa from Colorado. Subsequently, Mimesa was relegated to subgeneric status within the genus Psen by Malloch (1933) creating a case of secondary homonymy. Pate (1944) recognized this homonymy and proposed the new name ezra to replace the junior homonym.

BIOLOGY. M. ezra has been reported by Williams (1914) as nesting in the soil and utilizing the leafhopper Exitianus exitiosus (Uhler) as prey.

Mimesa spatulata new sp.

DESCRIPTION. Female. Length averaging 9 mm. Black; tegulae, undersides of antennal flagella, frequently apices of fore tibiae and fore tibio-femoral joint, abdominal segments with apex of first, all of second, and much to all of third tergite, second and third sternites, yellow to red. Wings hyaline, stigma and veins brown. Pubescence silvery, not dense on frons or clypeus.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus moderately punctate and chagreened, distinctly shinier medio-apically, with an indistinct subapical tumidity, apex centrally sub-triangular (infrequently medially notched) and with a lateral angulation or tooth; lower frons with a well-developed tubercle between the lower margins of the antennal insertions; upper frons closely punctate medially, appearing almost striato-punctate, much less so laterally; vertex moderately punctate and chagreened, with an indistinct postocellar tumidity but no furrow; gena reflexed near lower eye margin, upper gena moderately punctate and chagreened, lower gena smooth and

shiny; occipital carina distinct except for a narrow distance before juncture with hypostomal carina; antenna with first flagellar segment nearly twice the length of second flagellar segment, width of last flagellar segment at base at least as wide as scape.

Thorax. Pronotum normal; mesoscutum moderately shiny, sparsely punctate, heavily chagreened; notaulices distinct anteriorly; parapsidal lines distinct; mesoscutellum very shiny, nearly impunctate, partly chagreened; postscutellum normal; mesoepisternum with anepisternum finely striate, katepisternum chagreened, strongly so posteriorly; propodeum with lateral spheres elevated from dorsal area, not separated by distinct carinae, dorsal area chagreened, traversed by obliquely-angled, irregular fine striations, lateral spheres heavily chagreened throughout, finely striate with striations continuous with those of dorsal area, enclosure shallow, widely open, not flanked by carinae, extreme lateral areas chagreened; hind coxa approximately twice as long as hind trochanter, and without a longitudinal, ventral carina.

Abdomen. Petiole with a mid-dorsal raised portion (as in pauper) and with shallow, dorso-lateral sulci, angulate in outline, without prominent or complete dorso-lateral carinae, dorsal surface smooth to lightly chagreened; ratio of length of petiole to first abdominal tergite to hind femur -- 6:5:6.5; first abdominal tergite only weakly elevated above petiole;

pygidium broad, delimited by a well-developed carina, deeply punctate, more densely so apically, mostly chagreened anteriolaterally.

Male. Length averaging 8 mm. Characters similar to female generally but differing in the following respects: black; with only undersides of, at most, apical six or seven flagellar segments, yellowish, generally only second abdominal segment, apex of first abdominal tergite (infrequently anterior portion of third abdominal segment) red; clypeus with apex distinctly notched medially giving the appearance of two broadly rounded, extremely shiny teeth; vertex coarsely and irregularly granulate; antenna without tyloides; propodeum generally more deeply striated; no delimited pygidial area.

TYPES. Holotype, female, Old Station, Shasta Co., California, July 4, 1955 (on Potentilla) (P. D. Hurd) (University of California, Berkeley); allotype, male, 6 mi. w. Tragedy Springs, Amador Co., California (C. G. Moore) (University of California, Davis). Paratypes: all from California; 3 females, 1 male, July 22-27, 1957 (R. M. Bohart), 5 females, 3 males, July 5-8, 1958 (R. M. Bohart), 1 female, Sept. 24, 1956 (R. M. Bohart), all from Carnelian Bay, Lake Tahoe; 7 females, Bridge Cr. Camp, Lassen Co., July 9, 1949 (W. F. Erhardt, J. W. MacSwain, F. Moroshita); 1 female, Susan R.

Camp, Lassen Co., July 10, 1949 (R. G. Howell); 1 female, Westwood, Lassen Co., July 9, 1949 (E. G. Linsley); 1 female, Placer Co., July (G. E. Bohart); 1 female, Carson Pass, Alpine Co., July 26, 1959 (L. A. Stange); 1 female, 1 male, Forestdale Mdw., Alpine Co., July 17, 1960 (A. S. Menke, C. G. Moore); 1 female, 1 male, Ebbets Pass, Alpine Co., July 30, 1959 (R. M. Bohart); 1 male, Hope Valley, Alpine Co., July 18, 1948 (P. D. Hurd); 1 female, 8 mi. n. w. Chester, Plumas Co., Aug. 18, 1958 (J. Powell); 2 females, July 9, 1957 (R. M. Bohart), 1 female, July 14, 1951 (J. W. MacSwain), 1 female, Aug. 3, 1960 (D. Q. Cavagnaro), 1 male, Aug. 14, 1960 (A. S. Menke), 1 male, July 14, 1957 (Don Burdick) all from Strawberry, Tuolumne Co.; 5 females, 4 males, July 16, 1957 (J. W. MacSwain), 1 female, Aug. 5, 1960 (A. S, Menke), all from Leland Mdw., Tuolumne Co.; 1 female, Chipmunk Flat, Tuolumne Co., Aug. 9, 1960 (D. Q. Cavagnaro); 1 female, July 2, 1957 (J. W. MacSwain), 1 male, June 26, 1951 (J. W. MacSwain) both from Dardanelles, Tuolumne Co.; 1 female, Kennedy Mdw., Tuolumne Co., July 9, 1957 (R. H. James); 1 male, Lake Basin, Tuolumne Co., Aug. 3, 1957 (R. H. James); 2 females, 9 males, Weber Lake, Sierra Co., July 21, Aug. 4-5, 1951 (E. I. Schlinger); 1 female, July 14, 1958 (R. M. Bohart), 1 male, July 26, 1956 (R. M. Bohart) both from Sierraville, Sierra Co.; 1 female, Smithville, 15 mi. s. e. Sierraville, Sierra Co., July 4, 1960 (F. D. Parker); 1

female, Giant Forest, Aug. 9-13, 1927 (J. C. Bradley); 3 females, 5 males, July 4, 1955 (P. D. Hurd), 2 females, June 24, 1955 (W. W. Middlekauff, J. W. MacSwain) all from Old Station, Shasta Co.; 1 female, 2 males, Hat Creek P. O., Shasta Co., June 23-27, 1955 (J. W. MacSwain, W. W. Middlekauff); 2 males, Moose Camp, Shasta Co., July 14, 1955 (E. I. Schlinger, J. C. Downey); 1 female, 1 male, Yosemite, June 11-17, 1921 (E. O. Essig); 1 male, Mt. Lassen Nat. Park, July 2, 1947 (R. M. Bohart); 8 males, 6 mi. w. Tragedy Springs, Amador Co., July 16, 1960 (A. S. Menke); 3 males, Mt. Shasta City, Siskiyou Co., June 27-29, 1958 (J. Powell); 1 male, 10 mi. n. e. Bartle, Siskiyou Co., June 20, 1954 (E. I. Schlinger); 1 male, Tamarack Lake, July 19, 1931 (E. O. Essig); 1 male, Lake Tenaya, Yosemite Nat. Park, July 20, 1958 (A. D. Telford); 1 male, Angora Peak, July 19, 1951 (E. O. Essig); 2 males, Sagohen n. Hobart Mills, July 21, 1954 (R. M. Bohart); 1 male, Echo Lake, Eldorado Co., July 8, 1946 (P. H. Arnaud).

DISTRIBUTION. Sierra Nevada and Siskiyou Mountains, California.

DIAGNOSIS. This species bears a close relationship to unicincta but differs from that species in the females by the strikingly different form of the clypeus. The males of spatulata can be immediately distinguished from those of

unicincta by the shiny and impunctate condition of the apex of the clypeus. Further, these clypeal characters alone can be used to distinguish members of this species from members of other species within the genus.

DISCUSSION. M. spatulata is a montane form which has probably arisen from a basic unicincta stock.

BIOLOGY. Unknown, with the exception of floral visitation records of the females to flowers of Potentilla.

Mimesa pauper Packard

Mimesa pauper Packard 1867:409 (male)
Psen pauper, Fox 1898:14 (female)
Psen (Mimesa) pauper, Malloch 1933:41
Mimesa (Mimesa) pauper, Krombein 1951:960
Mimesa borealis Smith 1842:8 (male); Packard 1867:408
Psen borealis, Fox 1898:13-14 (female)
Psen (Mimesa) psychrus Pate 1944:133 (new name for Mimesa borealis Smith, not Dahlbom). New Synonymy.

DESCRIPTION. Female. Length averaging 6 mm. Black; tegulae, undersides of antennal flagella (exclusive of first segment), tarsi, generally fore tibiae, second and third abdominal sternites, apex of first abdominal tergite, second and third abdominal tergites, yellow to red. Wings hyaline, stigma and veins brown but with apical portion of stigma lighter brown in color. Pubescence silvery, sparse on clypeus.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus finely and closely punctate, infrequently with a subapical transverse tumid area, apex variable, commonly with an indistinct medial emargination; lower frons with a well-developed tubercle between the lower margins of the antennal insertions; upper frons closely but finely punctate; vertex moderately shiny, commonly densely chagreened, sparsely punctate, never striate, without a postocellar tumidity or furrow; gena reflexed near lower eye margin, upper gena finely punctate, frequently striate medially, lower gena shiny and chagreened; occipital carina distinct, terminating well before juncture with hypostomal carina; antenna with first flagellar segment at least one and one-third times as long as second flagellar segment; width of last flagellar segment distinctly greater at base than width of scape.

Thorax. Pronotum normal; mesoscutum dull, densely chagreened, with a few widely-spaced, piliferous punctures; notaulices distinct anteriorly; parapsidal lines distinct and complete to hind margin of mesoscutum; mesoscutellum much as in mesoscutum; postscutellum normal; mesoepisternum with anepisternal area longitudinally striate, katepisternal area mostly chagreened, generally finely striate posteriorly; propodeum with lateral spheres elevated from dorsal area and

separated from that area by irregular carinae; dorsal area with numerous parallel carinae becoming reticulate mesally, lateral spheres generally deeply rugose-reticulate, strongly chagreened on extreme lateral areas; enclosure deep and narrow; hind coxa approximately twice as long as hind trochanter, without a complete longitudinal ventral carina.

Abdomen. Petiole convex above, commonly with fine shallow dorso-lateral sulci, dorso-lateral carinae usually distinct, dorsal surface mostly smooth, shiny, with some chagreening or irregularities; ratio of length of petiole to first abdominal tergite to hind femur -- 5:4.5:6; first abdominal tergite moderately elevated above petiole; pygidium broad, delimited by a well-developed carina, deeply punctate and chagreened basally, closely punctate to striato-punctate on apical half.

Male. Length averaging 5.5 mm. Characters much as in female but differing in the following respects: abdomen commonly only with apex of first abdominal tergite and all of second segment, red; tibio-femoral joint commonly reddish; clypeus generally more densely pubescent, apex of clypeus commonly distinctly notched medially; antenna with well-developed ovate to linear tyloides on flagellar segments two to five, sometimes on six; propodeum generally much rougher with more pronounced fossulets; no delimited pygidial area.

TYPES. Of pauper: holotype, male, "Illinois" (Philadelphia Academy of Sciences); allotype, not designated. Of borealis: holotype, male, "Hudson Bay," Canada (British Museum (Natural History)); allotype, none.

DISTRIBUTION. Transition zone of North America.

MATERIAL EXAMINED. MICHIGAN: Pequaming, Aug. 12-13, 1903 (Morgan Hebard) (2 males); Kewennaw Co., June 26, 1955 (R. R. Dreisbach) (1 male); Crawford Co., July 10, 1959 (R. & K. Dreisbach) (2 males); Cheboygan Co., July 23, 1955 (R. R. Dreisbach) (1 male); South Side, Mackinaw, Cheboygan Co., July 23, 1952 (L. H. Skinner) (1 male); Topenabee, Cheboygan Co., July 29, 1952 (L. H. Skinner) (1 female); Ostego Co., July 7-9, 1959 (R. & K. Dreisbach) (8 males); Osceola Co., July 22, 1958 (R. R. Dreisbach) (1 male); Antrim Co., July 4, 1959 (R. & K. Dreisbach) (2 males), July 4, 1960 (R. R. Dreisbach) (1 male); Gogebic Co., Aug. 2, 1937 (R. R. Dreisbach) (1 male); Dickinson Co., Aug. 2, 1937 (R. R. Dreisbach) (1 male); Missaukee Co., Aug. 12, 1953, July 20, 1957 and July 4, 1952 (R. R. Dreisbach) (3 males); Grand Traverse Co., July 9, 1960 (R. R. Dreisbach) (1 male); Delta Co., July 6-Aug. 6, 1959 (R. & K. Dreisbach) (1 male, 1 female); Gladwin Co., July 28-30, 1959 (R. R. Dreisbach) (1 male, 1 female); Huron Co., July 11, 1949 (R. R. Dreisbach) (1 male); St. Joseph Co., Aug. 3, 1953 (R. R. Dreisbach) (1 male);

East Lansing, July 15, 1948 (1 male); Midland Co., July 9-13, 1957 and July 17-27, 1959 (R. & K. Dreisbach) (2 males, 2 females); Clare Co., Aug. 11, 1957 and July 23-28, 1959 (R. R. Dreisbach) (3 females); Ogemaw Co., July 23-28, 1959 (R. R. Dreisbach) (1 female); Schoolcraft Co., Aug. 5, 1959 (R. & K. Dreisbach) (1 female); Alger Co., Aug. 14, 1953 (R. R. Dreisbach) (3 females); Ontonogan Co., Aug. 25, 1959 (R. & K. Dreisbach) (1 female); Luce, Aug. 30, 1952 (R. R. Dreisbach) (1 female); Iron Co., Aug. 27, 1952 (R. R. Dreisbach) (1 female).

MINNESOTA: Norman Co., July 20-24, 1923 (A. A. Nichol) (1 female, 2 males); Middle River, Aug. 10, 1935 (D. G. Denning) (1 male); University Farm, St. Paul, July 23, 1924 (Walter Carter) (1 male); Kanabec Co., July 15-21, 1934 (C. R. Yeager) (1 male); Ada, July 5, 1911 (D. Stoner) (1 male); Beaver Dam, Cook Co., Aug. 12, 1922 (Wm. E. Hoffman) (1 female); "Minnesota," July 24, 1914 (1 female).

NEW YORK: Springlake, Cayuga Co., July 22, 1918 (1 male); Cornell University (1 male, 1 female); South Hill, Ithaca, Sept. 3, 1956, July 24, 1956 and July 23, 1958 (H. E. Evans) (2 males, 1 female); Kite Hill, Ithaca, Oct. 10, 1935 (P. P. Babiy) (1 female); Ithaca, July 24, 1928 and Aug. 26-Sept. 2, 1929 (P. P. Babiy) (5 males), July 5, 1887, Sept. 6-Aug. 22, 1931, Aug. 22, 1926 (7 males); Jamestown, July 23, 1934 (1 male); Flatbush, Aug. 18, 1903, Aug. 20,

1897 and Aug. 6, 1896 (J. L. Zabriskie) (3 males); Adirondack Mtns., August, 1899 (1 male, 1 female); Rochester, Aug. 6, 1937 (1 female); Farmingdale, July 30, 1938 (H. & M. Townes) (1 male); Potsdam, Aug. 20, 1900 (1 male); Keene Valley, Essex Co., July 20, 1918 and July 31, 1915 (H. Notman) (1 male, 1 female); New Rochelle, Sept. 9, 1933 (1 female); Albion (1 female); Ringwood Tompkins Co., Aug. 9, 1929 (P. P. Babiy) (1 male).

NEW HAMPSHIRE: Franconia (3 females); Nelson, Sept. 1, 1907 and July 15, 1907 (2 males, 1 female); Durham, July 27 (J. C. Bridwell) (1 male).

MARYLAND: Thomas Rd., n. w. Cumberland, Sept. 7, 1953 (L. M. Walkley) (1 female); "Maryland," July 20, 1934 (C. H. Hoffmann) (1 male, 1 female).

NEW JERSEY: Riverton, July 25, Aug. 19, Sept. 13, 1927 (C. H. Ballow) (2 males, 1 female); Princeton (1 male); Clifton, Aug. 27-29, 1934 (1 male, 1 female); Westville, Aug. 21, 1892 (1 male).

CONNECTICUT: East Hartford, Aug. 18, Sept. 4-5, 1947 (H. E. Evans) (4 males, 2 females); Canaan, Aug. 29, 1952 (A. Stone) (1 male, 1 female).

MASSACHUSETTS: Woods Hole, Aug. 22, 1947 (K. W. Cooper) (2 females, 1 male); Monterey, Aug. 25, 1953 (E. A. Chapin) (1 male); Cummington, Aug. 26, 1947 (H. E. Evans) (3 males).

VERMONT: Lyndon, Aug. 22, 1900 (1 male); Lyndon (3

females, 1 male).

MAINE: Perry, Aug. 5, 1955 (H. E. Evans) (1 male).

PENNSYLVANIA: Philadelphia (1 male); Dupont, Aug. 2, 1944 (H. K. Townes) (2 males); Lockhaven, Aug. 18, 1958 (K. W. Cooper) (1 male).

WISCONSIN: Milwaukee (1 male); Worden Township, Clark Co., July 14-28, 1919 (9 males, 4 females).

WYOMING: Jackson, July 23, 1953 (R. R. Dreisbach) (1 male); Centennial, Snowy Range, 10,000', Aug. 9, 1950 (R. K. Schwab) (1 male).

IOWA: Sioux City, Aug. 26, 1930 (C. N. Ainslie) (1 male).

ILLINOIS: Chicago, Sept. 20, 1928 (H. Brun) (1 female); Bluffs, Scott Co., Aug. 29, 1951 (A. T. McClay) (1 male).

MONTANA: Chouteau, Teton Co., June 30, 1955 and July 28, 1954 (R. C. Froeschner) (3 males); Harlowton, July 14, 1932 (2 males); Gallatin Co., July 20, 1936 (1 male); Saltese, Aug. 22, 1916 (A. L. Melander) (1 male); "Montana" (5 males, 1 female).

COLORADO: Wray, Aug. 17-19, 1919 (1 male); Meeker, July 20, 1919 (1 male); "Colorado" (1 male).

IDAHO: Collins, July 27, 1898 (C. V. Piper) (1 male); 23 mi. s. Avery, Shoshone Co., July 12, 1958 (A. R. Gittins) (8 males); East Idaho, June 9, 1931 (1 male).

OREGON: Prineville, Crooked River, July 22, 1939 (Gray

& Schuh). (1 male).

ALBERTA: Edmonton, July 25, Aug. 20, 1932 (O. Peck) (2 males), Aug. 2-5, 1948 (E. H. Strickland) (4 females); Beverly, June 28 and July 13, 1959 (A. R. Gittins) (2 males); Irving, June 23, 1959 (A. R. Gittins) (1 male); Drumheller (1 male); Bilby, July 14, 1924 (O. Bryant) (1 male); Beaverlodge, June 7, 1931 (O. Peck) (1 male); Waterton, July 14, 1923 (H. L. Seamans) (1 male).

BRITISH COLUMBIA: Kamloops, June 8, 1941 (G. J. Spencer) (1 male).

SASKATCHEWAN: 5 mi. e. Swift Current, June 22, 1959 (A. R. Gittins) (2 males); Parkberg, June 22, 1959 (A. R. Gittins) (1 male).

ONTARIO: Ottawa, July 27-Aug. 16, 1947 (W. R. M. Mason) (3 males, 1 female); Coniston, July 15, 1927 (H. S. Parish) (3 males).

NEW BRUNSWICK: Nerepis, July 22-24 and Aug. 18-22 (A. G. Leavitt) (4 males, 2 females); "New Brunswick" (1 male).

NOVA SCOTIA: Truro, Aug. 12-26, 1913 (R. Matheson) (8 males, 2 females).

DIAGNOSIS. This species can generally be recognized by the sparsely pubescent, apically emarginated clypeus of the female, pronounced ovate character of the tyloides of the male, and in both sexes by the generally reduced red coloration of

the abdomen, the presence of dorso-lateral sulci on the petiole, and the distinct rugose condition of the propodeum. In addition, the species may be further distinguished from its allies by its small size, and in some cases the red tibio-femoral joints on the fore legs of the male.

DISCUSSION. This species is among the smallest I have seen of North American Mimesa. Without doubt, pauper, like cressoni, is one of the two more abundant species in the nearctic, particularly east of the Cordilleran Range. As currently treated, this species may represent a complex of several species since certain anatomical features frequently differ on a localized, geographical basis. Westernmost forms generally show a greater degree of red coloration and are frequently larger. Easternmost forms commonly differ in at least the possession of a subapical tumidity on the clypeus. However, until physiological or biological characteristics are available to refute my present interpretation, I prefer to recognize pauper as a single species.

Without having examined Smith's type of borealis, the proposed synonymy is not above question. However, after examining a large series of specimens identified as borealis and comparing Smith's descriptions with specimens of pauper it appears this synonymy is justified.

BIOLOGY. Unknown.

Mimesa unicincta Cresson

Mimesa unicincta Cresson 1865:488 (male); Packard 1867:410
Psen unicinctus, Fox 1898:15 (female)
Psen (Mimesa) unicinctus, Malloch 1933:32
Mimesa (Mimesa) unicincta, Krombein 1951:961
Mimesa proxima Cresson 1865:488 (female); Packard 1867:408
Psen proximus, Fox 1898:16-17
Psen (Mimesa) proximus, Malloch 1933:32-33
Mimesa (Mimesa) proxima, Krombein 1951:960. New Synonymy

DESCRIPTION. Female. Length averaging 6.5 mm. Black; tegulae amber, antennal flagella yellow beneath (less so in some forms); tarsi testaceous; apex of first abdominal tergite, all of second and third abdominal segments, and occasionally part to all of fourth segment, red. Wings hyaline, stigma and veins dark brown. Pubescence silvery, never dense.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus finely punctate, never greatly obscured by pubescence, without a subapical tumidity, apex commonly truncate, never denticulate or deeply indentate medially; lower frons with a well-developed tubercle between the lower margins of the antennal insertions; upper frons punctate to finely striato-punctate beneath ocellar area, mostly punctate and deeply chagreened elsewhere; vertex punctate and chagreened, appearing mostly granulate in some forms, without evidence of a postocellar furrow or tumidity; gena

reflexed near lower eye level, upper gena mostly distinctly striate, lower gena at most finely punctate; occipital carina distinct, becoming weak to evanescent immediately before juncture with hypostomal carina; antennae with first flagellar segment one and one-third to one and one-half times as long as second flagellar segment, width of last flagellar segment at base equal to width of scape.

Thorax. Pronotum normal; mesoscutum irregularly punctate and densely chagreened; notaulices distinct anteriorly; parapsidal lines distinct; mesoscutellum similar to mesoscutum, frequently shinier and less punctate or chagreened; postscutellum normal; mesoepisternum with anepisternal area mostly finely striate; katepisternum shiny, mostly punctate and chagreened, lightly striated posteriorly; propodeum variable, lateral spheres moderately elevated from dorsal area, both portions traversed laterally by oblique, continuous fine striations with chagreening between; dorsal area reticulate medially; enclosure deep, not flanked by a distinct carina, extremely lateral areas mostly chagreened; hind coxa approximately twice as long as hind trochanter and lacking a complete longitudinal ventral carina.

Abdomen. Petiole convex above, dorso-laterally sulcate, without complete dorso-lateral carinae, dorsal surface shiny to chagreened; ratio of length of petiole to first abdominal tergite to hind femur -- 6:6:7, first abdominal

tergite moderately elevated above petiole; pygidium broad, delimited by a well-developed carina and covered with deep, closely set punctations.

Male. Length averaging 5.5 mm. Differing from female in the following respects: abdomen with red color commonly confined to posterior half of first abdominal tergite, all of second tergite, and occasionally third tergite; clypeus and lower frons more densely pubescent, apex of clypeus medially notched; upper frons and vertex generally more coarsely punctate; antennal flagellum with segments two to six with moderately elevated, linear tyloides, last five segments commonly dark beneath; propodeum more strongly and irregularly striate; petiole nearly equal in length to hind femur; no delimited pygidial area.

TYPES. Of unicincta: holotype, male, "Colorado" (U. S. National Museum); allotype, not designated. Of proxima: female, "Colorado" (U. S. National Museum); allotype, not designated.

DISTRIBUTION. Nebraska west to California and British Columbia.

MATERIAL EXAMINED. CALIFORNIA: Carnelian Bay, Lake Tahoe, July 22, 1957 and Sept. 5, 1956 (R. M. Bohart) (3 females); Sonora Pass, Aug. 10, 1957 (D. D. Linsdale) (1 female),

Aug. 20, 1960 (A. S. Menke) (1 male, 7 females); Winnemucca Lake, Alpine Co., June 30, 1959 (R. M. Bohart, P. M. Marsh, L. E. Campos) (9 males, 4 females); Highland Lake, Alpine Co., July 30, 1959 (L. E. Campos) (1 female); Angora Pass, July 19, 1931 (E. O. Essig) (1 female); Webber Lake, Nevada Co., Aug. 25, 1946 (R. M. Bohart) (1 female); Tuolumne Meadow, Yosemite, July 31, 1955 (J. R. Jesson) (1 female); Hallelujah Jct., Lassen Co., June 27, 1949 (W. F. Ehrhardt) (1 female); Sattley, Sierra Co., July 22, 1949 (E. I. Schlinger) (1 female); Echo Lake, Eldorado Co., July 7, 1931 (E. O. Essig) (1 male), July 23, 1955 (E. I. Schlinger) (1 male), July 27, 1955 (W. W. Middlekauff) (1 male); Cottonwood Creek, Mono Co., July 14, 1953 (W. D. McLellan) (1 male); Silver Lake, Amador Co., July 25, 1955 (J. C. Downey) (1 male); Scott Mt., Trinity Co., July 15, 1955 (R. M. Bohart) (1 male); Sardine Creek, Mono Co., July 11, 1951 (A. T. McClay) (1 male); Tallac Lake, July 7, 1915 (E. P. VanDuzee) (1 male); Chipmunk Flat, Tuolumne Co., Aug. 8, 1960 (D. Q. Cavagnaro) (1 male).

COLORADO: Deer Cr. Canyon, Aug. 8, 1960 (R. R. Dreisbach) (3 females); Glen Haven, Aug. 14, 1952 (R. R. Dreisbach) (2 females); Estes Park, Aug. 8, 1952 (R. R. Dreisbach) (1 female); Jefferson Co., Aug. 1, 1955 (R. R. Dreisbach) (1 female); Tennessee Pass, July 30, 1919 (1 female).

NEBRASKA: Custer Co., Aug. 21, 1951 (R. R. Dreisbach) (1 female); Glen, Sioux Co., Aug. 20, 1906 (H. S. Smith) (1 female); Halsey, Sept. 1, 1924 (R. W. Dawson) (1 female).

DIAGNOSIS. Females of this species may be distinguished from those of allied forms by the truncate condition of the clypeal apex, lack of a subapical tumidity on the clypeus, and the predominantly striated condition of the propodeum. Males of unicincta are not so readily characterized but can generally be identified by the characters listed in the key.

DISCUSSION. Both unicincta and proxima were originally described from Colorado. While Cresson's descriptions allude to a number of differing features between these two species, my examination of the types of unicincta and proxima reveals that the two specimens differ only in the ornamentation of the propodeum. The holotype of proxima exhibits a more finely and evenly striate condition of the lateral spheres of the propodeum than that found in the unicincta holotype. This difference, however, falls well within the range of my concept of the species unicincta. However, considerable variation is evident between specimens I have assigned to the species, leading one to believe that a species complex exists within the presently defined limits of unicincta.

BIOLOGY. Unknown.

Mimesa arizonensis (Malloch)

Psen (Mimesa) arizonensis Malloch 1933:36 (male)
Mimesa (Mimesa) arizonensis, Krombein 1951:960

DESCRIPTION. Female. Unknown.

Male. Length 8 mm. Black; tegulae amber; antennal flagella yellow beneath, brown above; first, second and third abdominal tergites red; tibiae and tarsi yellowish. Wings hyaline, stigma brown, paler at base, veins dark brown. Pubescence silvery.

Head. Nearly quadrate, slightly wider (including compound eyes) than long; clypeus finely punctate, partly obscured by dense pubescence, without a subapical tumidity, apex emarginate medially; lower frons with a well-developed tubercle between the antennal bases; upper frons finely but closely punctate; vertex less strongly punctate than upper frons, microscopically striate on lateral areas, without a postocellar furrow but with a slight postocellar tumidity; gena reflexed near lower eye margin, upper gena striate, lower gena at most finely punctate below; (occipital carina not visible below on holotype); antenna with first flagellar segment approximately one and one-half times as long as second flagellar segment, width of last flagellar segment at base equal to width of scape, without distinct tyloides on any flagellar segment.

Thorax. Pronotum normal; mesoscutum dull glossy, finely punctate and chagreened; notaulices distinct anteriorly; parapsidal lines distinct; mesoscutellum similar to mesoscutum; postscutellum dull and irregular; mesopleuron with anepisternal area distinctly striate, katepisternal area chagreened to punctate, partly striate along posterior margin; propodeum with lateral spheres elevated from dorsal area, both portions traversed by mostly continuous, obliquely angled striations; enclosure deeply set, not flanked by carinae; hind coxa approximately twice as long as hind trochanter, without a complete longitudinal ventral carina.

Abdomen. Petiole convex above, dorso-lateral carinae indistinct; ratio of length of petiole to first abdominal tergite to hind femur -- 5:6:6.5, first abdominal tergite only moderately elevated from petiole; no delimited pygidial area.

TYPE. Holotype, male, Tucson, Arizona (Towmey) (U. S. National Museum, No. 44214); allotype, none.

DISTRIBUTION. Arizona.

MATERIAL EXAMINED. Holotype.

DIAGNOSIS. Males of arizonensis can be distinguished by the entirely red first, second and third abdominal tergites and the absence of antennal tyloides.

DISCUSSION. This species is known only from the single male holotype. While this specimen can be distinguished from males of other species, the lack of collected material referable to this species casts some doubt as to its validity. I believe arizonensis is probably an aberrent form of coquilletti or ezra but I continue to include arizonensis as a distinct species because I am presently unable to assign it as a synonym to either of those two species.

BIOLOGY. Unknown.

Mimesa gregaria (Fox)

Psen gregarius Fox 1898:16 (male)
Psen (Mimesa) gregarius, Malloch 1933:42
Mimesa (Mimesa) gregaria, Krombein 1951:960
Psen (Mimesa) gregarius var. simplex Malloch 1933:42-43 (male and female)
Mimesa (Mimesa) gregaria var. simplex, Krombein 1951:960. New Synonymy

DESCRIPTION. Female. Length averaging 8.5 mm. Black; tegulae, occasionally variable portions of tarsi, tibiae and tibio-femoral joints, yellowish-red; undersides of antennal flagella yellow; apex of first abdominal tergite, second abdominal segment, commonly all of third abdominal segment, red. Wings hyaline, stigma brown, frequently light-brown basally, veins dark brown. Pubescence silvery.

Head. Nearly quadrate, slightly wider (including

compound eyes) than long; clypeus finely punctate and chagreened, without a subapical elevation but frequently with a subapical transverse depression, apex broadly truncate, weakly emarginate in some forms; lower frons with a well-developed tubercle between the lower margins of the antennal insertions; upper frons punctate and chagreened; vertex moderately shiny, punctate and chagreened, frequently with a postocellar tumidity, less commonly with a postocellar furrow; gena reflexed near lower eye level, upper gena sparsely, finely striate, lower gena shiny, at most sparsely punctate; occipital carina distinct, becoming evanescent near juncture with hypostomal carina; antenna with first flagellar segment nearly one and one-half times as long as second flagellar segment, width of last flagellar segment at base equal to width of scape.

Thorax. Pronotum normal; mesoscutum dull, densely chagreened with widely spaced punctations; notaulices distinct anteriorly (obscure on holotype); parapsidal lines distinct; mesoscutellum shiny, with few punctations and no chagreening; postscutellum normal; mesoepisternum with anepisternal area distinctly, longitudinally striate, katepisternum mostly chagreened, striate along posterior margin; propodeum with lateral spheres not distinctly elevated from dorsal area nor separated by distinct carinae, dorsal area commonly traversed by mostly parallel, cristate striations, reticulate medially,

lateral spheres finely striate and granulate, occasionally nearly rugose-reticulate, finely striate along extreme lateral portions; enclosure narrow, moderately deep, not flanked by carinae; hind coxa approximately twice as long as hind trochanter and without a complete ventral carina.

Abdomen. Petiole highly variable, usually convex to slightly sulcate dorsally, dorso-lateral carinae commonly complete, dorsal surface mostly shiny; ratio of length of petiole to first abdominal tergite to hind femur variable, but with petiole length always distinctly shorter than length of hind femur; pygidium broad, delimited by a well-developed carina and covered with deep, closely set punctations, more dense and piliferous apically, considerable chagreening.

Male. Length of holotype 5.5 mm. Characters similar to female but differing in the following respects: first abdominal tergite, all of second abdominal segment, red, infrequently with red on third abdominal segment; legs generally with tarsi, tibiae and apices of femur reddish in color; clypeus and lower frons more densely pubescent; clypeus with apex medially notched; vertex and upper gena frequently with striations; antenna with papillate tyloides present on flagellar segments two to five (tyloides absent in some forms); propodeum with lateral spheres occasionally very rugose; petiole variable, dorso-lateral carinae indistinct in holotype; no delimited pygidial area.

TYPES. Of gregaria: holotype, male, "Colorado" (Gillette) (Philadelphia Academy of Sciences); allotype, not designated. Of simplex: holotype, male, Adelaide, Idaho, June 22, 1927 (U. S. National Museum, No. 44218); allotype, female, Adelaide, Idaho, June 24, 1929.

DISTRIBUTION. Western North America.

MATERIAL EXAMINED. IDAHO. Emery Canyon, 12 mi. s. e. Oakley, Cassia Co., July 23, 1959 (W. F. Barr) (4 males, 6 females); Homedale, Owyhee Co., Oct. 2, 1959 (W. F. Barr) (1 female); East Idaho, June 9, 1931 (D. Fox) (5 males); Red Rock Pass, Fremont Co., (on Geranium), June 16, 1956 (W. F. Barr) (2 males); 2 mi. n. Mann's Creek, Wash. Co., May 31, 1962 (A. R. Gittins) (1 male); Mountain Home, Elmore Co., Sept. 16, 1957 (W. F. Barr) (1 female), June 15, 1926 (R. W. Haegele) (1 male); Lewiston, Nez Perce Co., June 25, 1952 (E. I. Schlinger) (1 male), Oct. 2, 1959 (A. R. Gittins) (1 female); Bovill, Latah Co., Aug. 14, 1961 (M. Ollieu) (1 female); Juliaetta, Latah Co., (1 male); Bear Creek Pass, July 9, 1947 (R. M. Bohart) (1 female, 2 males); 4 mi. n. w. Melba, Canyon Co., July 3, 1957 (on parsnip flower) (H. W. Homan) (1 female); Pocatello, Bannock Co., June 18, 1950 (R. W. Portman) (1 male); 12 mi. n. w. Regina, Ada Co., July 11, 1952 (on Healianthus) (W. F. Barr) (1 male); Pingree, Bingham Co., July 30, 1947 (on Alfalfa) (G. E. Bohart) (1

female).

NEVADA: 17 mi. n. w. Gerlach, Washoe Co., Sept. 6, 1957 (on Chrysothamnus) (R. C. Bechtel) (2 females); 3 mi. w. Hazen, Churchill Co., June 17, 1960 (on Tamarix) (F. D. Parker) (1 female).

UTAH: Logan, June 17, 1938 (L. Cutler) (1 female), May 1, 1940 (E. E. Jensen) (1 female); Soldier Summit, July 14, 1952 (Pentstemon) (G. F. Knowlton) (1 female); Kelton, June 24, 1932 (G. F. Knowlton) (1 male); Trenton, July 24, 1958 (G. E. Bohart) (1 male); Newton, Cache Co., July 1, 1955 (R. M. Bohart) (1 male); 10 mi. w. Parowan, Iron Co., July 25, 1948 (M. Cazier) (1 female).

OREGON: Summer Lake, Aug. 16, 1939 (Schuh & Gray) (1 female).

COLORADO: Meeker, July 20 (1 female); Aspen, July 24 (1 female); Pagosa Springs, June 22 (1 female); Fremont Co., Aug. 20, 1960 (R. & K. Dreisbach) (1 female); Glen Haven, Aug. 14, 1952 (R. R. Dreisbach) (1 female); Deer Cr. Canyon, Aug. 16, 1960 (R. & K. Dreisbach) (1 female).

MONTANA: "Montana" (2 females).

ARIZONA: San Carlos, May 12, 1918 (J. C. Bradley) (1 female).

CALIFORNIA: Bridge Camp, Shasta Co., July 9, 1949 (E. I. Schlinger) (2 females); Hobart Mills, Nevada Co., July 6, 1954 (R. M. Bohart) (1 female); Dollar L. trail, San

Bernadino Mtns., July 10, 1956 (Eriodictyon) (H. R. Moffitt) (1 female); Smith Mill, 15 mi. s. e. Sierraville, July 4, 1960 (F. D. Parker) (2 females); Falls Pub. Cp., San Bernadino Mtns., July 11, 1956 (R. C. Bechtel) (1 female); Hallelujah Jct., Lassen Co., June 27, 1949 (W. F. Ehrhardt) (1 female); Pickle Mdw., Mono Co., Aug. 11, 1960 (A. S. Menke) (1 female); Leavitt Mdw., Mono Co., July 6, 1951 (A. T. McClay) (1 female); 4 mi. w. Quincy, Plumas Co., June 25, 1949 (P. D. Hurd) (1 female); Big Pine Cr., Inyo Co., June 16, 1942 (R. M. Bohart) (1 female); Keen Camp, San Jacinto Mtns., May 31, 1939 (Penstemon) (W. C. Bush) (1 female); Pollock Pines, Eldorado Co., Aug. 19, 1953 (E. I. Schlinger) (1 female).

WASHINGTON: Pullman, July 10, 1953 (Bede Chigho) (1 female); Wawawai, Sept. 6, 1908 (W. M. Mann) (1 female).

ALBERTA: Raymond, June 15, 1923 (H. L. Seamans) (1 male); Manyberries, Aug. 11, 1939 (E. H. Strickland) (1 female); Medicine Hat, June 18, 1940 (J. L. Carr) (1 female).

BRITISH COLUMBIA: Kamloops, Aug. 12, 1945 (G. J. Spencer) (2 females); Lac du Bois, July 7, 1946 (G. J. Spencer) (1 female).

DIAGNOSIS. Females of gregaria are recognizable by the truncate or near truncate condition of the clypeal apex, lack of a subapical tumidity on the clypeus, the frequent presence of a postocellar tumidity, the dense chagreening of the

mesoscutum, the characteristics of the propodeum and the short petiole. Males closely resemble those of pauper but may be differentiated from males of that species by the less pronounced character of the antennal tyloides.

DISCUSSION. I am treating this taxon as a species complex. Malloch (1933) recognized the heterogeneous nature of gregaria when he described the "variety" simplex. Like Malloch, I do not wish to recognize the variety simplex as a distinct species for I have seen many specimens which exhibit anatomical features intermediate between simplex and gregaria. M. gregaria simplex has been separated from gregaria because of the absence of distinct antennal tyloides in the males and the reddish-yellow coloration of the tarsi and at least inner surfaces of the fore tibiae in both sexes. The males and females of the typical gregaria do not have these same characteristics.

Subsequent investigation, however, particularly in the realm of biological studies, might well reveal the existence of reproductive isolation between a number of components within this complex that are not recognizable today on the basis of anatomical studies.

BIOLOGY. Members of this species have been collected in beet leafhopper (Circulifer tenellus (Baker)) study plots in southern Idaho. While this information affords no demonstrable

proof of host relationships, it does indicate the possibility that the beet leafhopper may serve as a host for Mimesa gregaria. Floral visitations by this species have been recorded from the following plants: Penstemon, Eriodictyon, Tamarix, Medicago sativa, Chrysothamnus sp., and Pastinaca sativa. Additionally, both males and females of gregaria were collected at Emery Canyon, Cassia Co., Idaho by W. F. Barr from Veratrum sp. heavily infested with Aphis sp. Whether these wasps were attracted to the aphid secretions was suspected but not ascertained.

Genus Psen Latreille

Psen Latreille 1796:122; Panzer 1801:163; Panzer 1806:107; Jurine 1807:135; Shuckard 1837:224; Packard 1867:396; Fox 1898:1; Rohwer 1910:99; Malloch 1933:12; deBeaumont 1937:40; Van Lith 1959:12.
Psenia Kirby 1829:361; Krombein 1951:959 (synonymy?)
Dahlbomia Wissman 1849:9; Kohl 1896:11 (synonymy)
Mesopora Wesmael 1852:279; Kohl 1896:11 (synonymy)

Head. Front with a longitudinal median carina extending from a tubercle between the lower margin of the antennal insertions to the median ocellus, commonly with fine transverse facial carinae extending laterally from tubercle to lower margins of antennal sutures; clypeus with apex not noticeably thickened, emarginate; occipital carina complete dorsally and laterally, meeting hypostomal carina considerably distant from median line on venter; antennae of female clavate, less

so but frequently somewhat flattened in male.

Thorax. Pronotum with well-developed, subapical, transverse carina becoming more cristate laterally, lateral lobes dark to amber, never whitish; prepectus triangular, well-defined; mesopleuron with episternal suture complete and distinct, dividing mesoepisternum into well-defined anepisternite and katepisternite, anepisternite shiny, very finely punctate, katepisternite similarly ornamented; propodeum variably ornamented, commonly striate to finely rugose-reticulate; fore-wing with first recurrent vein joining second submarginal cell, second recurrent vein usually joining third submarginal cells (occasionally interstitial with second transverse cubital vein), second submarginal cell moderately narrowed above; hind wing with juncture of M and Cu veins proximad of cu-a cross vein; hind femur with inner surface bare on upper half, with a series of soft hairs on lower half extending from near base to apex.

Abdomen. Red or black; petiole dorsally convex, dorso-lateral margins angulate, rounded, without dorsal sulci or carinae, never with a series of hairs dorso-laterally; pygidium always present in female, broad, delimited laterally and posteriorly by a carina.

DISCUSSION. This genus, along with Mimumesa, Mimesa, Pseneo and Ammopsen, belongs to the Pseni group. Psen can be readily

separated from Pseneo by the lack of a greatly thickened clypeal apex, absence of an elongate-oval patch of short fine hairs on the inner, apical portion of the hind femur, the second recurrent vein commonly joining the third submarginal cell, the broad pygidium of the female, and the presence on the male of fasciculate hairs at the apices of at least the third abdominal tergite. The absence of a series of piliferous punctures near the dorso-lateral edges of the petiole and the lack of pubescence on the upper, inner portion of the hind femur at once distinguishes Psen from Mimumesa and Mimesa. Apart from size differences between Psen and the much smaller Ammopsen the presence of a complete occipital carina and the transverse, dorsal, subapical pronotal carina separates Psen from Ammopsen in which those features are lacking.

GENEROTYPES. Psen-Sphex atra Fabricius. Psenia-Sphex atra Fabricius.

Dahlbomia - Sphex atra Fabricius (orig. des.)

Mesopora - Sphex atra Fabricius (orig. des.).

DISTRIBUTION. Eastern and southern United States west to New Mexico.

BIOLOGY. Our knowledge of the biology of these insects is fragmentary but the genus is better known biologically than

any other psenine genus in the nearctic region. From meager data it is likely that all North American Psen nest in wood and stock their nests with species of Cercopidae and Membracidae. Spooner (1948) indicated Psen ater in England probably nests in dead timber in disused galleries of wood-boring beetles, but also cited records of this species nesting in hard sandy soil.

Nothing is known of the parasites or parasitoids of Psen nor of any floral visitation records for any members of the genus.

KEY TO THE NEARCTIC SPECIES OF PSEN OCCURRING NORTH OF MEXICO

1. Antennae 13-segmented; pygidium absent (males)..... 2

-- Antennae 12-segmented; pygidium present (females)..... 5

2. Abdomen shining black, sternite four with fasciculate, short soft hairs, confined to middle of hind margin... 3

-- Abdomen partly red, sternites four and five with prominent fasciculate hairs, extending across much of hind margins..... 4

3. Petiole slightly angulate along sides, without distinct ventro-lateral carinae; mesopleuron with large, deep, almost contiguous punctures on most of its surface.... ..... unifasciculatus Malloch

-- Petiole strongly angulate laterally, with distinct ventro-lateral carinae; mesopleuron with small, shallow, isolated punctures on most of its surface... barthi Viereck

4. Petiole red, remainder of abdomen black; antennal flagellum without tyloides..... erythropoda Rohwer

-- Petiole black, remainder of abdomen red; antennal flagellum with carinate tyloides on segments three to ten.. ..... monticola (Packard)

5. Abdomen partly reddish; tibiae reddish; clypeus not toothed; pygidium at base as wide as long, densely chagreened and dull on most to all of surface..... 6

-- Abdomen black; tibiae black; clypeus dentate; pygidium at base narrower than long, apically chagreened..... ..... barthi Viereck

6. Petiole red, remainder of abdomen black; mesoscutum coarsely striato-punctate over almost entire surface..... ..... erythropoda Rohwer

-- Petiole black, remainder of abdomen red; mesoscutum with fine separated punctures over entire surface..... ..... monticola (Packard)

Psen unifasciculatus Malloch

Psen (Psen) unifasciculatus Malloch 1933:15 (male); Krombein 1951:959

TYPE. Holotype, male, Beulah, New Mexico, Aug. 8, 1900 (T. D. A. and W. P. Cockerell) (U. S. National Museum, No. 44209); allotype, not designated.

DISTRIBUTION. Known only from Beulah, New Mexico.

Psen barthi Viereck

Psen barthi Viereck 1907:251 (female)
Psen (Psen) barthi, Krombein 1951:959
Mimesa myersiana Rohwer 1909:324 (male and female)
Psen (Psen) myersiana, Malloch 1933:959; Krombein 1951:959 (synonymy)

TYPES. Of barthi: holotype, female, Milwaukee, Wisconsin (Barth) (Milwaukee Public Museum); allotype, not designated. Of myersiana: holotype, female, Wetzel's Swamp, near Harrisburg, Pennsylvania, reared January, 1909 (P. R. Myers) (U. S. National Museum); allotype, "?".

DISTRIBUTION. Connecticut, Pennsylvania, Maryland and Wisconsin.

NOTES. P. barthi has been recorded as nesting in wood. Prey recorded as Cyrtolobus fenestratus (Fitch), Atymna inornata (Say), Micrutalis calva (Say) and possibly Enchenopa binotata

(Say), all members of the Smiliinae, a subfamily of the Homopterous family Membracidae.

Psen erythropoda Rohwer

Psen (Mimesa) erythropoda Rohwer 1910:102 (female)
Psen (Psen) erythropoda, Malloch 1933:14; Krombein 1951:959

TYPE. Holotype, female, Great Falls, Virginia, Aug. 22 (F. Knab) (U. S. National Museum, No. 12362); allotype, not designated.

DISTRIBUTION. Eastern United States, New York to North Carolina.

NOTES. Malloch (1933) indicated that one specimen of erythropoda he had examined had mounted with it a specimen of Cercopidae, Aphrophora quadrinotata Say. As Malloch states, "I assume that the wasp intended the bug as provision for its nest, but no data are given on the label as to the circumstances attending their capture."

Psen monticola (Packard)

Mimesa monticola Packard 1867:407 (male)
Psen monticola, Fox 1898:11 (female)
Psen (Psen) monticola, Malloch 1933:14; Krombein

TYPES. Holotype, male, Tuckerman's Ravine, Mt. Washington,

New Hampshire, Aug. 11 (C. A. Shurtleff) (Bost. Soc. Nat. Hist. Museum); allotype, not designated.

DISTRIBUTION. New Hampshire to Georgia, west to Michigan and Alabama.

Genus Pseneo Malloch

Psen (Pseneo) Malloch 1933:7; Krombein 1950:277; Krombein 1951:959; Van Lith 1959:9

Head. Front with a longitudinal median carina extending from a tubercle between the lower margins of the antennal insertions to the median ocellus, with fine transverse facial carinae extending laterally from tubercle to lower margins of antennal sutures; clypeus with apex greatly thickened along middle third, sulcate, crossed by three carinae giving appearance of being minutely tridentate; occipital carina complete dorsally and laterally, meeting hypostomal carina considerably distant from median line on venter; antennae of female clavate, less so in male.

Thorax. Pronotum with well-developed, subapical, transverse carina becoming more cristate laterally, lateral lobes dark; prepectus triangular, well-defined; mesopleuron with episternal suture complete, dividing mesoepisternum into well-defined anepisternite and katepisternite, anepisternite dull

or moderately shiny, strongly punctate to striato-punctate, katepisternite similarly ornamented; propodeum in part finely to strongly rugose-reticulate; forewing with first and second recurrent veins joining second submarginal cell, second submarginal cell moderately narrowed above; hind wing with juncture of M and Cu veins proximad of cu-a cross vein; hind femur with an elongate-oval patch of short, pale hair near apex of inner surface.

Abdomen. Black; petiole dorsally convex, dorso-lateral margins rounded, without dorsal sulci or carinae, never with a series of hairs dorso-laterally; pygidium present in female, narrowed, delimited laterally and posteriorly by a carina.

DISCUSSION. This genus, along with Psen, Mimesa, Mimumesa and Ammopsen, belongs to the Pseni group. Pseneo can be distinguished immediately from the other psenine genera by the strikingly different form of the clypeus. In Pseneo the clypeal apex is greatly thickened along the medial one-third and the thickened portion is traversed by three carinae which appear as three teeth when viewed from the front. In all other genera the clypeus is never thickened apically.

I recognize Pseneo as a distinct genus on the basis of several unique anatomical features. Pseneo has previously been considered as a subgenus of Psen but it differs more from Psen than Psen differs from the well-established genus

Mimumesa. I consider Pseneo as a distinct genus because of the strikingly different form of the clypeus, the truncate condition of the posterior margin of the metasternum, the sharply carinate inner and outer margins of the hind coxae, the presence of an elongate-oval patch of hair on the inner apical surface of the hind femur, the absence in the males of apical fascicles of hairs on all abdominal sternites and the large emarginate median lobe on the eighth abdominal sternite of the male. Information on species biologies, however, is too incomplete to be used as an aid in supporting the elevation of Pseneo to generic status.

BIOLOGY. Krombein (1951) has written that species of Pseneo prey on species of Membracidae and Cicadellidae. The nesting habits of this group remain obscure although one species is strongly suspected of nesting in wood and a second species has been reared from soil but the cocoons bear fragments of wood.

Nothing is known of the parasites or parasitoids of Pseneo nor of any floral visitation records for members of this genus.

KEY TO THE NEARCTIC SPECIES AND SUBSPECIES OF PSENEO OCCURRING NORTH OF MEXICO

1. Mesoscutellum ruguloso-punctate; pygidium of female with well-defined median carina, extending as far or farther basally than lateral carinae which delimits pygidium; antennal flagella of male with small papilliform tyloides beneath in the middle of segments one to eight or two to nine..... (kohlii Fox)..... 2

-- Mesoscutellum punctate; pygidium of female with median carina not well-defined on basal half; antennal flagella of male with very large tyloides beneath on segments three to ten..... 3

2. Pronotum with lateral angles not produced, rectangulate when viewed anteriorly; propodeum with central hexagonal portion of dorsal area not crossed by one or more rugae; tarsi ferruginous; antennal flagella of males with tyloides present on segments one to eight..... ..... kohlii kohlii Fox

-- Pronotum with lateral angles strongly produced, spicate, acutely angulate when viewed anteriorly; propodeum with central hexagonal portion of dorsal area crossed by one or more rugae; tarsi brown; antennal flagella of male with tyloides present on segments two to nine..... ..... kohlii spicatus Malloch

3. Antennae 13-segmented; pygidium absent (males)..... 4

-- Antennae 12-segmented; pygidium present (females)..... 7

4. Antennal flagella with tyloides, broad, rounded, shining and sparsely punctate; petiole black; tarsi ferruginous; New Jersey to North Carolina, chiefly in the Carolinian zone..... simplicicornis Fox

-- Antennal flagella with tyloides, narrow, more or less rectangular, dull and closely punctate...(punctatus Fox) 5

5. Wings yellowish; legs entirely, propodeum in part, petiole and first two abdominal tergites ferruginous; Tropical zone in southern Florida..... ..... punctatus ferrugineus (Viereck)

-- Wings hyaline; propodeum and tergites dark..... 6

6. Mesopleuron ruguloso-punctate; petiole and legs to a variable extent reddish; chiefly in the Austroriparian zone..... punctatus carolina Rohwer

-- Mesopleuron with separated punctures on most of disk; petiole black; legs black, tarsi brownish; Upper Sonoran zone..... punctatus punctatus Fox

7. Mesopleuron ruguloso-punctate; wings strongly yellowish; legs entirely, propodeum in part, petiole and first two abdominal tergites ferruginous; Tropical zone of southern Florida..... punctatus ferrugineus (Viereck)

-- Mesopleuron with separated punctures on most of disk; wings

hyaline; coxae black, propodeum and first two abdominal tergites dark..... 8

8. Clypeus and frons with pale golden pubescence; tibiae and tarsi ferruginous; Austroriparian zone north to District of Columbia..... punctatus carolina Rohwer

-- Clypeus and frons with silvery pubescence; legs black except tarsi which are red or brown..... 9

9. Antennal flagella with basal segments red beneath, dark brown above; slightly larger forms, average length 12.9 mm.; mesoscutum anterio-laterally punctate with most of punctures separated by about half the diameter of punctations; Upper Sonoran zone..... punctatus punctatus Fox

-- Antennal flagella with basal segments entirely red; smaller forms, average length 11.3 mm.; mesoscutum anterio-laterally almost ruguloso-punctate with mostly subcontiguous punctations; Carolinian zone from New Jersey to North Carolina..... simplicicornis Fox

Pseneo kohlii (Fox) n. comb.

Psen niger Packard 1867:399 (misidentification in part); Krombein 1950:280
Psen Kohlii Fox 1898:9 (in part); Brimley 1938:445
Mimesa kohlii, Viereck 1901:342
Psen (Mimesa) kohlii, Rohwer 1917:243
Psen (Pseneo) kohlii, Malloch 1933:9
Psen (Pseneo) kohlii kohlii, Krombein 1950:280
Psen simplicicornis Fox 1898:10 (misidentification in part); Krombein 1950:280
Psen (Pseneo) fulvipes Malloch 1933:11 (female); Krombein 1950:280 (synonymy)
Psen (Pseneo) angulatus Malloch 1933:12 (male); Krombein 1950:280 (synonymy)

TYPES. Of kohlii kohlii: holotype, female, Philadelphia, Pennsylvania (Philadelphia Academy of Sciences); allotype, not designated. Of fulvipes: holotype, female, Coleta, Alabama (H. H. Smith) (U. S. National Museum, No. 44206). Of angulatus: holotype, male, Nelson County, Virginia, Aug. 10, 1924 (W. Robinson) (U. S. National Museum, No. 44208).

DISTRIBUTION. New York south to Georgia, Alabama, Kansas.

NOTES. Krombein (1950) states, "This form is the most common of the three occurring at Washington and has been captured almost entirely in rather open woods or at their edges. I consider it likely that the species nests in wood though no reared specimens are available, nor has anything been published on the nesting habits or prey preferences."

Pseneo kohlii spicatus (Malloch) n. comb.

Psen (Pseneo) spicatus Malloch 1933:12 (male); Krombein 1950:282

TYPE. Holotype, male, Beulah, New Mexico, Aug. 8, 1900 (T. D. A. and W. P. Cockerell) (U. S. National Museum, No. 44207).

DISTRIBUTION. Known only from the type series taken at Beulah, New Mexico.

Pseneo punctatus punctatus (Fox) n. comb.

Psen punctatus Fox 1898:9 (female)
Mimesa punctata, Viereck 1901:27; Mickel 1918:361
Psen (Pseneo) punctatus, Malloch 1933:10 (female, male); Krombein 1950:284

TYPE. Holotype, female, "Colorado" (Gillette) (Philadelphia Academy of Sciences); allotype, not designated.

DISTRIBUTION. South Dakota, Nebraska and Colorado.

Pseneo punctatus carolina (Rohwer) n. comb.

Psen (Mimesa) punctata var. carolina Rohwer 1910:103 (female)
Psen (Pseneo) carolina, Malloch 1933:11
Psen carolina, Brimley 1938:445
Psen (Pseneo) punctatus carolina, Krombein 1950:283

TYPE. Holotype, female, Raleigh, North Carolina, Sept. 12,

1905 (U. S. National Museum, No. 12363); allotype, not designated.

DISTRIBUTION. District of Columbia south to Florida, west to Mississippi.

NOTES. Krombein (1950) reports a wasp taken from a burrow in a flower pot from a greenhouse at Gainsville, Florida, on Oct. 16, 1943. The soil yielded a series of cells, each containing four or five leafhoppers. A total of 42 adults and five nymphs of Homalodisca triquetra (Fabricius) and one adult of Graphocephala coccinea (Foerster) was taken from the soil.

Pseneo punctatus ferrugineus (Viereck) n. comb.

Mimesa ferruginea Viereck 1901:341 (male)
Psen (Pseneo) ferrugineus, Malloch 1933:9
Psen (Pseneo) punctatus ferrugineus, Krombein 1950:284

TYPE. Holotype, male, Biscayne Bay, Florida (Mrs. Slosson) (Philadelphia Academy of Sciences); allotype, not designated.

DISTRIBUTION. Southern Florida.

Pseneo simplicicornis (Fox)

Psen Kohlii Fox 1898:9 (misidentification in part); Krombein 1950:284
Psen simplicicornis Fox 1898:10 (female, male misident.); Brimley 1938:445
Mimesa simplicicornis; Viereck 1901:342
Psen (Pseneo) simplicicornis, Malloch 1933:10 (male, female); Krombein 1950:284

TYPE. Holotype, female, "Virginia" (Philadelphia Academy of Sciences).

DISTRIBUTION. Eastern coastal states, Pennsylvania to North Carolina.

NOTES. Specimens have been reared from cocoons bearing fragments of wood pulp and containing the remains of Graphocephala sp. and some other Cicadellinae.

NOMINA DUBIA

Mimumesa (?) coloradoensis Cameron

Psen (Mimesa) coloradoensis Cameron 1908:232 (female)
Psen (Mimumesa) coloradoensis, Malloch 1933:26
Mimesa (Mimumesa) coloradoensis, Krombein 1951:961

Cameron's type is not available, and his description is too brief and incomplete to allow positive identification. However, it appears that this species belongs to the "mixta" group and is probably a synonym of mixta (Fox). The type

locality which Cameron lists --- Berkeley County, Colorado -- is non-existent.

Mimumesa (?) interstitialis Cameron

Psen (Mimesa) interstitialis Cameron 1908:233 (male)
Psen (Mimumesa) interstitialis, Malloch 1933:26
Mimesa (Mimumesa) interstitialis, Krombein 1951:961

Cameron's type of this species is not available. Malloch (1933) states that the holotype of interstitialis may be in the British Museum of Natural History. Cameron (1908) rejects the idea that interstitialis may be a male of coloradoensis owing to "the interstitial second recurrent and cubital nerves, the lack of a distinct frontal keel, and the shorter abdominal petiole." I agree with Malloch (1933) when he stated, "The lack of a frontal keel would appear to suggest that the species does not belong to this (subgenus), but the observation may not have been accurate, and there is some variation in the length of the abdominal petiole in many species of the subfamily, especially in the sexes of certain species. It is possible to decide what this species is without examination of the type."

LITERATURE CITED

Ashmead, William H. 1899. Classification of the entomophilous wasps, or the superfamily Sphegoidea (Paper No. 3). Canadian Entomologist 31 (8):223-225.

Barth, H. 1907. On the nesting habits of Psen barthi Viereck. Wisconsin Natural History Society Bulletin 5 (4):251-257.

Beaumont, Jacques, de. 1937. Les Psenini (Hym. Sphecid.) de la region paléarctique. Mitteilungen der Schweizerischen Entomologischen Gesellschaft 17 (1-2):33-93.

Beaumont, Jacques, de. 1941. Note sur le genre Psen (Hym. Sphecid.). Mitteilungen der Schweizerischen Entomologischen Gesellschaft 18 (6):328-329.

Brimley, C. S. 1938. In: The insects of North Carolina, being a list of the insects of North Carolina and their close relatives. North Carolina Department of Agriculture, Raleigh, North Carolina, p. 445.

Cameron, P. 1908. On some undescribed American Hymenoptera chiefly from the southwest of the United States. Transactions of the American Entomology Society 34 (3):232-234.

Cresson, E. T. 1865. Catalogue of the Hymenoptera of Colorado Territory. Proceedings of the Entomological Society of Philadelphia 4:487-489.

Cresson, E. T. 1872. Hymenoptera Texana. Transactions of the American Entomological Society 4:227.

Cresson, E. T. 1887. Synopsis of the families and genera of the Hymenoptera of America, north of Mexico. Transactions of the American Entomological Society, Supplementary Volume, pp. 282-284.

Curtis, John. 1834. British Entomology, being illustrations and descriptions of the genera of insects found in Great Britain and Ireland 11:496.

Dahlbom, A. G. 1843. Hymenoptera Europaea praecipue borealis -- 1. Sphex in sensu Linneano, Lund, p. 2.

Evans, Howard E. 1959. Studies on the larvae of Digger Wasps (Hymenoptera, Sphecidae), Part V: Conclusion. Transactions of the American Entomological Society 85:139-145.

Fabricius, J. C. 1794. Entomologica Systematica emendata et aucta. classes, ordines, genera, species, etc., 4:457.

Fabricius, J. C. 1804. Systema Piezatorum apud Carolùm Reichard. Brunswick, pp. 205-207.

Fox, Wm. J. 1893. New species of Fossorial Hymenoptera. Canadian Entomologist 25 (5):117.

Fox, Wm. J. 1898. The species of Psen inhabiting America north of Mexico. Transactions of the American Entomological Society 25 (1):1-17.

Gussakovskij, V. 1933. Verzeichnis der von Herrn Dr. R. Malaise im Ussuri und Kamtschatka gesammelten aculeaten Hymenopteren. Arkiv for Zoolog: Utgifvet af K. Svenska Vertenskaps-Akademien, Stockholm 24 A (10):1-66. (not seen in original)

Gussakovskij, V. 1937. Espèces palearctiques des genres Didineis Wesm., Pison Latr., et Psen Latr. (Hymenoptera, Sphecodea). Travaux de Institut Zoologique de l'Academie des Sciences de l'URSS 4:599-698. (not seen in original)

Jurine, L. 1807. Nouvelle methode de classer l'Hymenoptera et l'Diptera. J. J. Paschoud, Imprimeur, Geneva, pp. 135-137.

Kincaid, Trevor. 1900. Papers from the Harriman Alaska expedition XIV. Entomological results (8): The Sphegoidea and Vespoidea. Proceedings of the Washington Academy of Science 2:508-509.

Kirby, W. F. 1829. In James Francis Stephens: Systematic Catalogue of the British Insects. London, 1829, p. 361.

Kohl, F. F. 1896. Die Gattungen der Sphegiden. Annalen des K. K. Naturhistorischen Hofmuseum 11:233-516.

Krombein, Karl V. 1949. An annotated list of the wasps from Nags Head and the Kill Devil hills. Journal of the

Elisha Mitchell Scientific Society 65 (2):268-269.

Krombein, Karl V. 1950. Synonymical notes on North American Sphecoid wasps: III (Hymenoptera). Bulletin of the Brooklyn Entomological Society 45 (2):35-40.

Krombein, Karl V. 1951 a. In: Hymenoptera of America north of Mexico synoptic catalog. United States Department of Agriculture, Agricultural Monograph 2: 957-962.

Krombein, Karl V. 1951 b. Wasp visitors of Tulip-tree honeydew at Dunn Loring, Virginia (Hymenoptera Aculeata). Annals of the Entomological Society of America 44 (1):143.

Krombein, Karl V. 1952. Preliminary annotated list of the wasps of Lost River State Park, West Virginia, with descriptions of new species and biological notes. Proceedings of the Entomological Society of Washington 54 (4):178.

Krombein, Karl V. 1955. Miscellaneous prey records of solitary wasps. I (Hymenoptera: Aculeata). Bulletin of the Brooklyn Entomological Society 50 (1):15-16.

Krombein, Karl V. 1958 a. In: Hymenoptera of America north of Mexico synoptic catalog, supplement I. United States Department of Agriculture, Agricultural Monograph 2:189.

Krombein, Karl V. 1958 b. Miscellaneous prey records of solitary wasps. III (Hymenoptera, Aculeata). Proceedings of the Biological Society of Washington 71 (6):22.

Krombein, Karl V. 1959. A new genus and species of Psenini from the southwestern deserts (Hymenoptera, Sphecidae). Bulletin of the Brooklyn Entomological Society 54 (1): 18-21.

Krombein, 1962. Biological notes on Acarid mites associated with solitary wood-nesting wasps and bees. Proceedings of the Entomological Society of Washington 64 (1):11-19.

Latreille, P. A. 1796. Prècis des caractéres generiques des insectes, disposés dans un ordre naturel. de l'Imprimerie de F. Bourdeaux pp. 122-123.

Leonard, Mortimer D. 1926. A list of the insects of New York. Cornell University, Agricultural Experiment Station Memoir 101:1013.

Malloch, J. R. 1933. Review of the wasps of the subfamily Pseninae of North America (Hymenoptera: Aculeata). Proceedings of the United States National Museum 82 (26):1-60, 2pl.

Mickel, C. E. 1916. New species of Hymenoptera of the superfamily Sphecoidea. Transactions of the American Entomological Society 42 (4):420-421.

Mickel, C. E. 1918. Sphecoidea of Nebraska. University of Nebraska Studies 17:358-361.

Packard, A. S. Jr. 1867. Revision of the Fossorial Hymenoptera of North America. Proceedings of the Entomological Society of Philadelphia 6:392-410.

Panzer, G. W. 1798. Faunae Insectorum Germanicae initia oder Deutschlands insecten 52:22.

Panzer, G. W. 1801. Intelligenzblatt der literatur zeitung d'Erlangen, p. 163.

Panzer, G. W. 1806. Kritische revision der insektenfaune Deutschlands nach dem system bearbeibet 2:107-110.

Pate, U. S. L. 1937. The generic names of the Sphecoid wasps and their type species (Hymenoptera: Aculeata). Memoirs of the American Entomological Society 9:9, 21, 23, 39, 40, 42, 51, 54.

Pate, U. S. L. 1944. Synonymical notes on the Psenine wasps (Hymenoptera, Sphecidae). Canadian Entomologist 76 (7):133.

Richards, D. W. 1956. Hymenoptera: Introduction and keys to families. Handbook for the identification of British Insects. Royal Entomological Society of London 6 (1): 1-94.

Rohwer, S. A. 1909. Notes and descriptions of wasps. Entomological News 20 (7):324-325.

Rohwer, S. A. 1910 a. Descriptions of new Psenid wasps from the United States (Hymenoptera: Psenidae). Proceedings

of the Washington Entomological Society 12 (1):99-104.

Rohwer, S. A. 1910 b. Three new Psenid wasps from New Jersey. Entomological News 21 (4):168-170.

Rohwer, S. A. 1916. In: State geological and natural history survey. State of Connecticut, Public Document No. 47:658-659.

Rohwer, S. A. 1920. Descriptions of twenty-five new species of North American Hymenoptera. Proceedings of the United States National Museum 57:228-229.

Say, Thomas. 1837. Descriptions of new North American Hymenoptera and observations on some already described. Boston Journal of Natural History 1:369-370.

Shuckard, W. E. 1837. Essay on Indigenous Fossorial Hymenoptera, London, p. 224.

Smith, H. S. 1908. I. The Sphegoidea of Nebraska. Nebraska University Studies 8 (4):65-71.

Smith, F. 1856. Catalogue of British Hymenoptera in the collection of the British Museum 4:429-436.

Snodgrass, Robert Evans. 1910. The thorax of the Hymenoptera. Proceedings of the United States National Museum 39:37-91, 16 pl.

Snodgrass, R. E. 1935. Principles of Insect Morphology. 1st ed. McGraw-Hill Book Co., Inc., New York and London, 1-1X, 1-667 pp. 319 fig.

Spooner, G. M. 1948. The British species of Psenine wasps (Hymenoptera: Sphecidae). Transactions of the Royal Entomological Society of London 99 (3):129-172, 5 figs.

Stoll, N. R. (chairman, ed. com.) 1961. International code of zoological nomenclature, adopted by the XV International Congress of Zoology. Richard Clay & Co., Ltd. Bungay, England. i-xvii, 1-176 pp.

Van Lith, J. P. 1959. Contributions to the knowledge of the Indo-Australian Pseninae (Hymenoptera, Sphecidae). Zoologische Verhandelingen 39:1-69, 100 figs.

Van der Linden, P. L. 1829. Observations sur les

Hyménoptères d'Europe de la famille des Fouisseurs. Nouveaux Mémoires de l'Academie Royale des Sciences et belles-lettres de Bruxelles 5:103-107.

Viereck, Henry L. 1901. New species of the subfamily Pseninae. Transactions of the American Entomological Society 27 (4):338-342.

Viereck, Henry L. 1903. Hymenoptera of Beulah, New Mexico. Transactions of the American Entomological Society 29 (1):66-67.

Viereck, Henry L. 1907. A new species of Pseninae. Wisconsin Natural History Society Bulletin 5 (4):251.

Wesmael, C. 1852. Revue critique des Hyménoptères Fouisseurs de Belgique. Bulletin Academie Science Royale de Belgique 19:271-280. (not seen in original)

Williams, F. X. 1914. Notes on the habits of some solitary wasps that occur in Kansas. Kansas University Science Bulletin 8 (6):226.

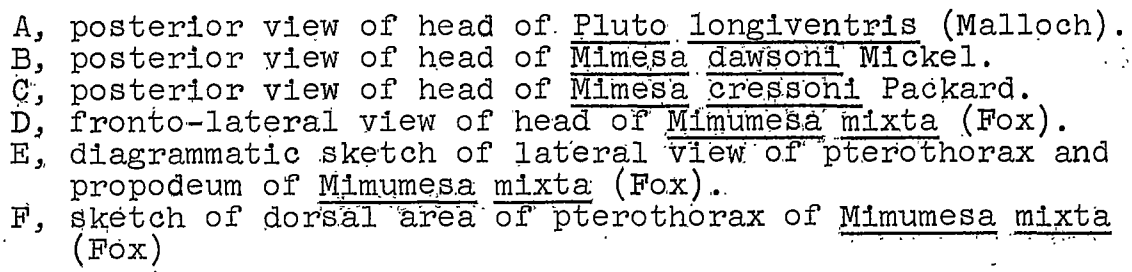
Wissman, -- 1849. Verzeichniss der im Königreich Hannover aufgefundenen Mordwespen. Entomologische Zeitung Herausgegeben von dem Entomologischen Vereine zu Stettin 10:9. (not seen in original)

Woodworth, C. W. 1913. Guide to California insects. The Law Press, Berkeley, p. 96.

Wray, David L. 1950. In: Insects of North Carolina, second supplement. North Carolina Department of Agriculture, Raleigh, North Carolina, p. 38.

APPENDIX

Figure 1



A, posterior view of head of Pluto longiventris (Malloch).
B, posterior view of head of Mimesa dawsoni Mickel.
C, posterior view of head of Mimesa cressoni Packard.
D, fronto-lateral view of head of Mimumesa mixta (Fox).
E, diagrammatic sketch of lateral view of pterothorax and propodeum of Mimumesa mixta (Fox).
F, sketch of dorsal area of pterothorax of Mimumesa mixta (Fox)

Legend

cl, clypeus; fm, foramen magnum; g, gena; hc, hypostomal carina; lf, lower frons; ln, lateral notaulix; mas, meso-anepisternum; me, mesoepisternum; mks, meso-katepisternum; mn, median notaulix; oc, occipital carina; par, parapsidal furrow; pre, prepectus; pro, propodeum; psct, postscutellum; sc, mesoscutum; sct, mesoscutellum; uf, upper frons; ug, upper gena; v, vertex.

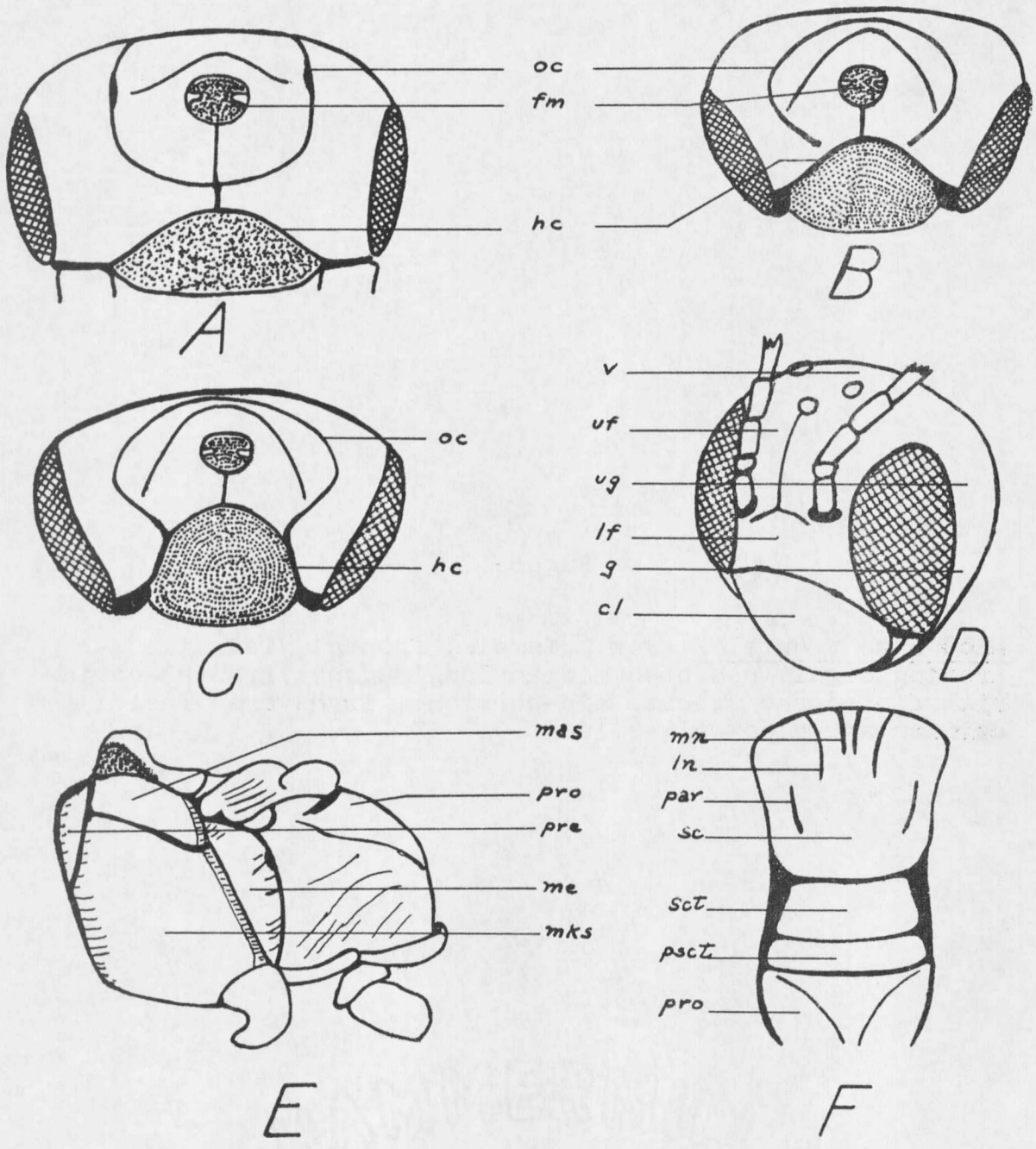

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Figure 1

Figure 2

Diodontus frontalis (Fox), female, frontal view, illustrating highly elevated median longitudinal frontal carina with flared and sulcate mid-portion. Transverse facial carinae are also well evident.

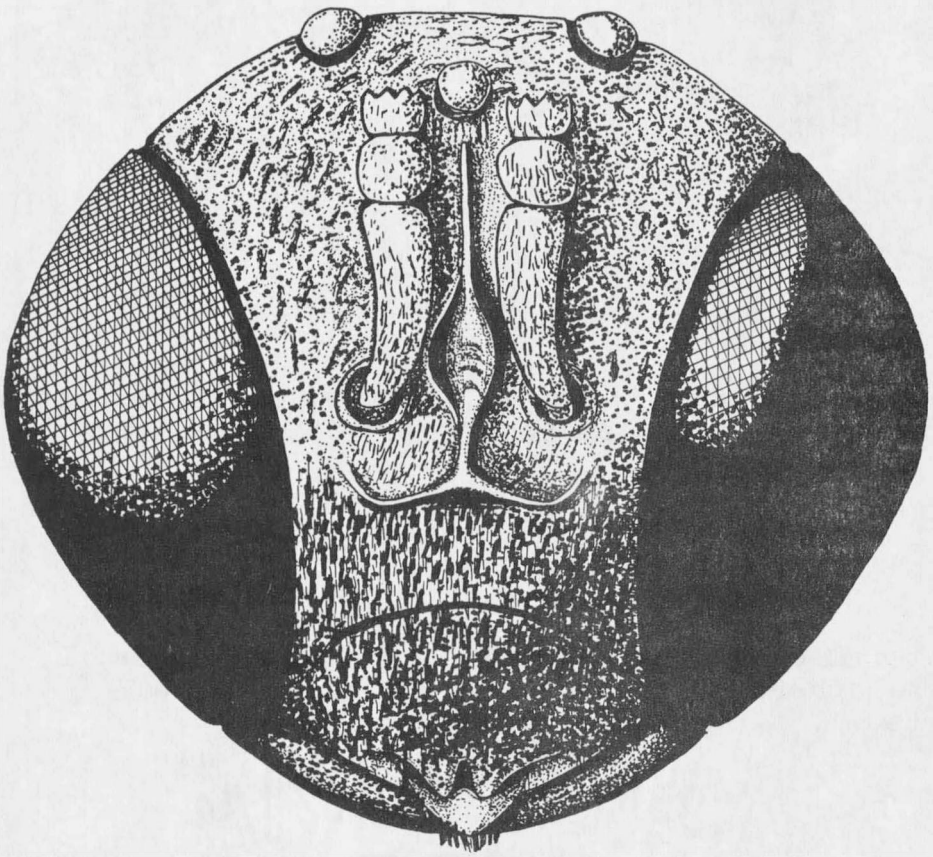

Figure 2

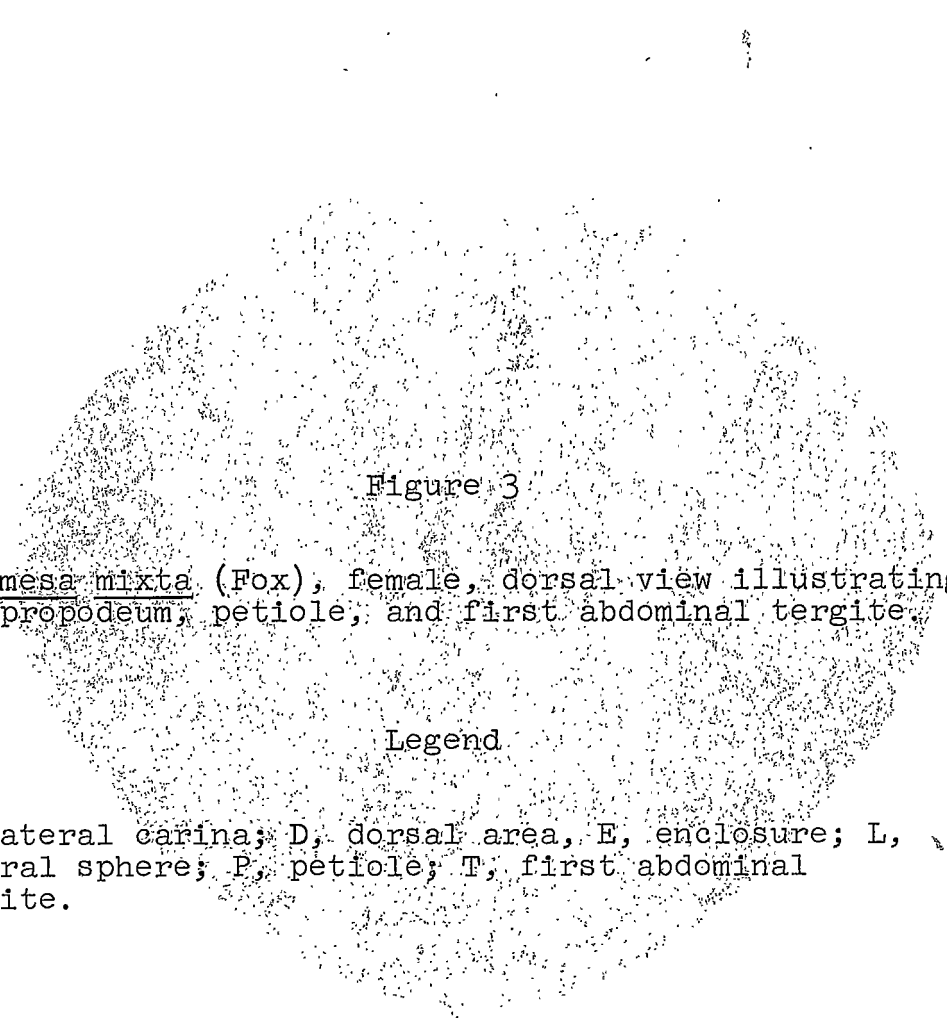

Figure 3

Mimumesa mixta (Fox), female, dorsal view illustrating the propodeum, petiole, and first abdominal tergite.

Legend

C, lateral carina; D, dorsal area, E, enclosure; L, lateral sphere; P, petiole; T, first abdominal tergite.

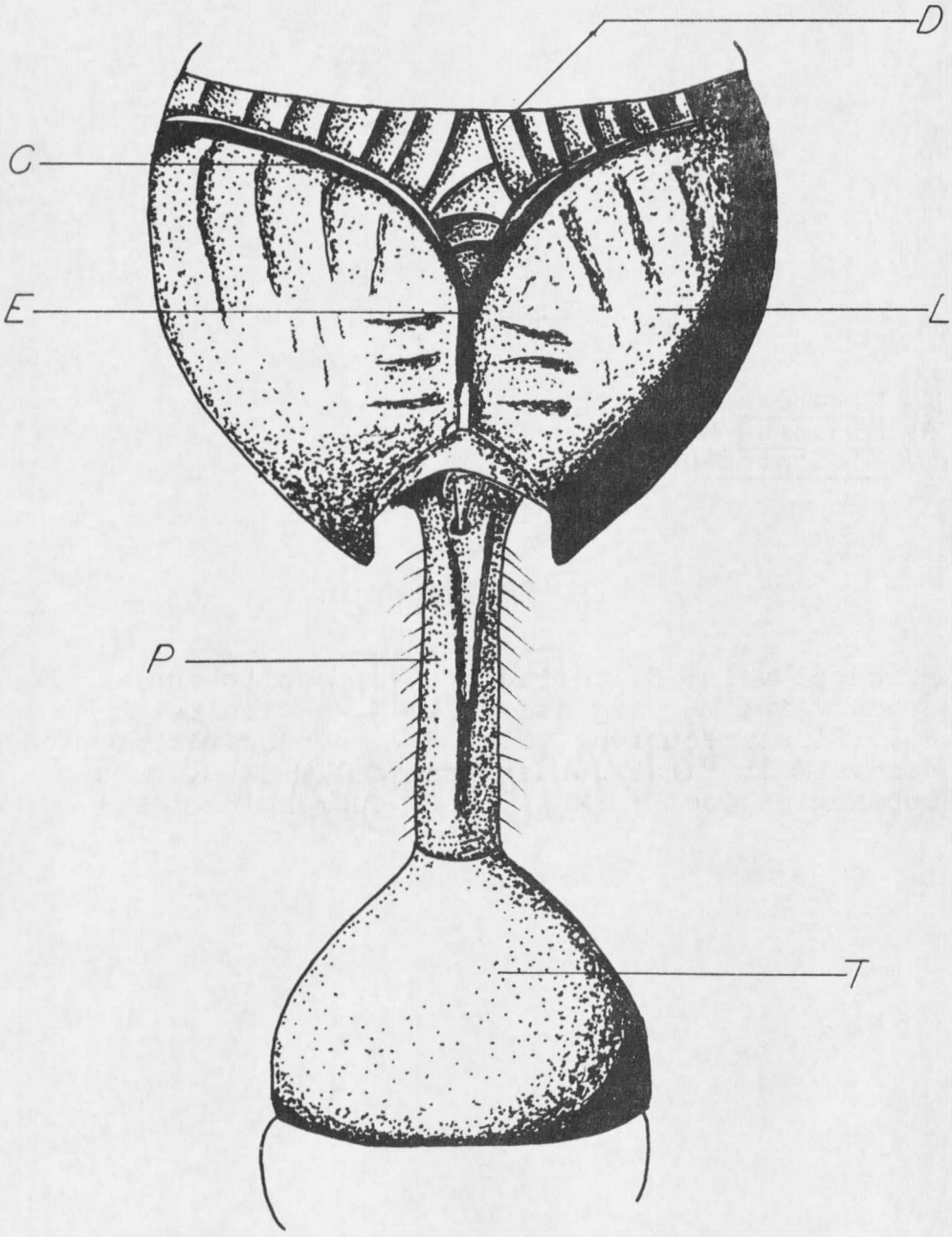

Figure 3

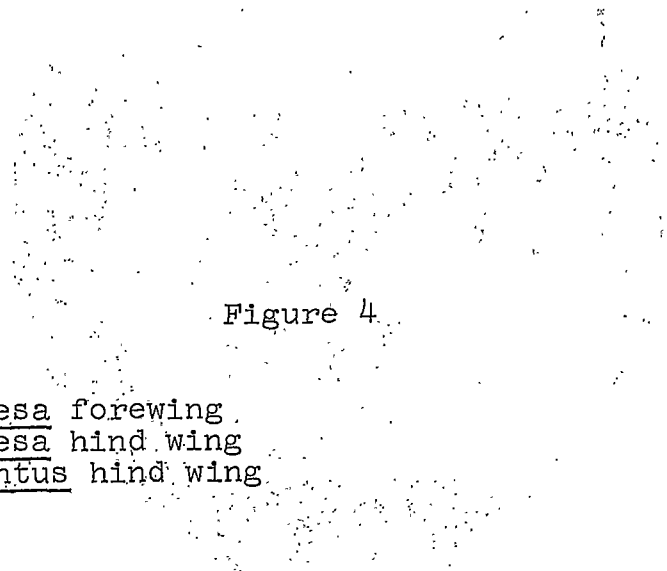

Figure 4

A, Mimumesa forewing.
B, Mimumesa hind wing
C, Diodontus hind wing

Legend

B, basal vein; C, cubitus; cu-a, cubito-anal cross vein; M, marginal cell; M, median vein; R 1, first recurrent vein; R 2, second recurrent vein; SM 1, first submarginal cell; SM 2, second submarginal cell; SM 3, third submarginal cell.

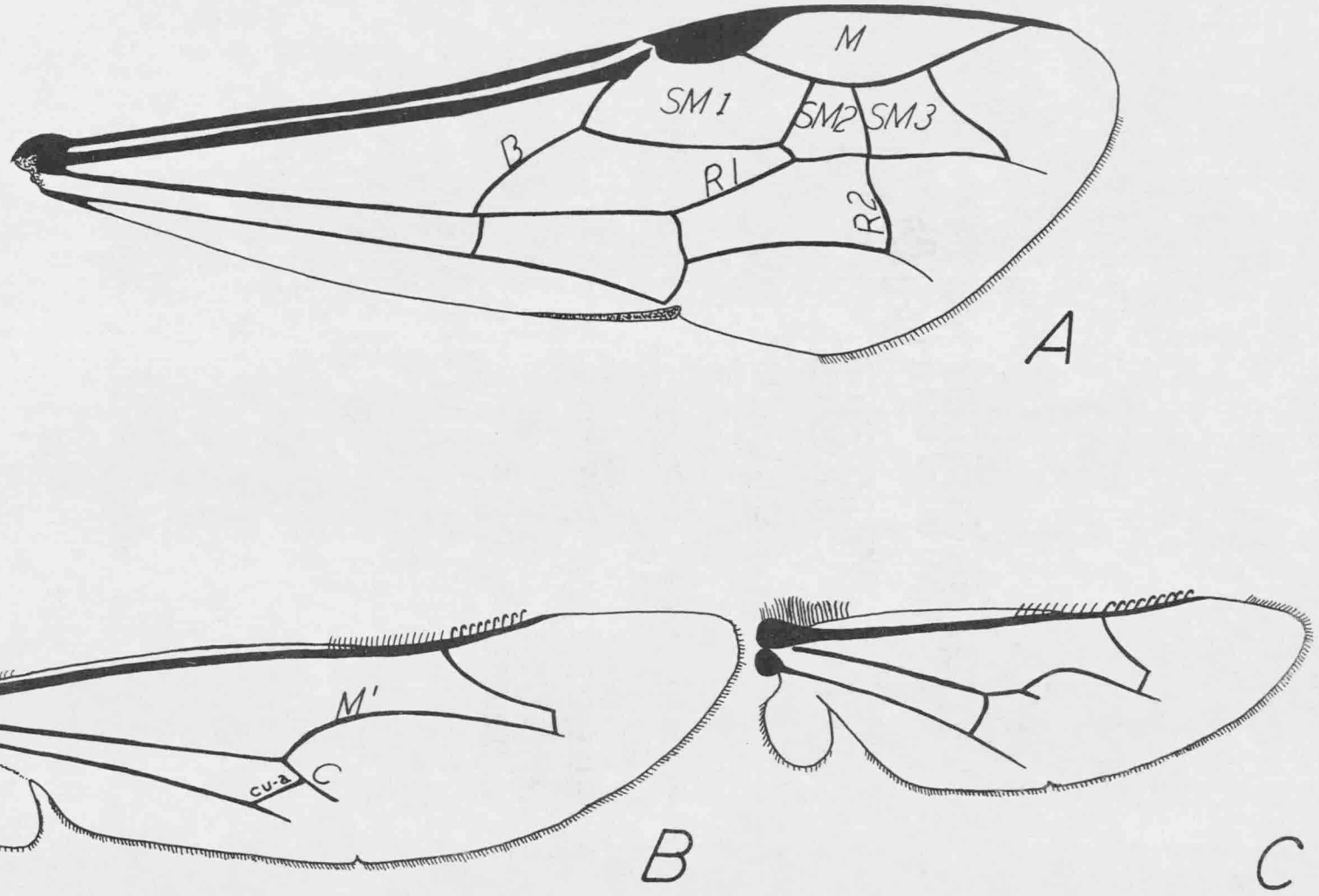

Figure 4

Figure 5

Intromittent organs in Mimumesa, lateral view.

A. Mimumesa johnsoni (Viereck)
B. M. clypeata (Fox)
C. M. mellipes (Say)
D. M. canadensis (Malloch)

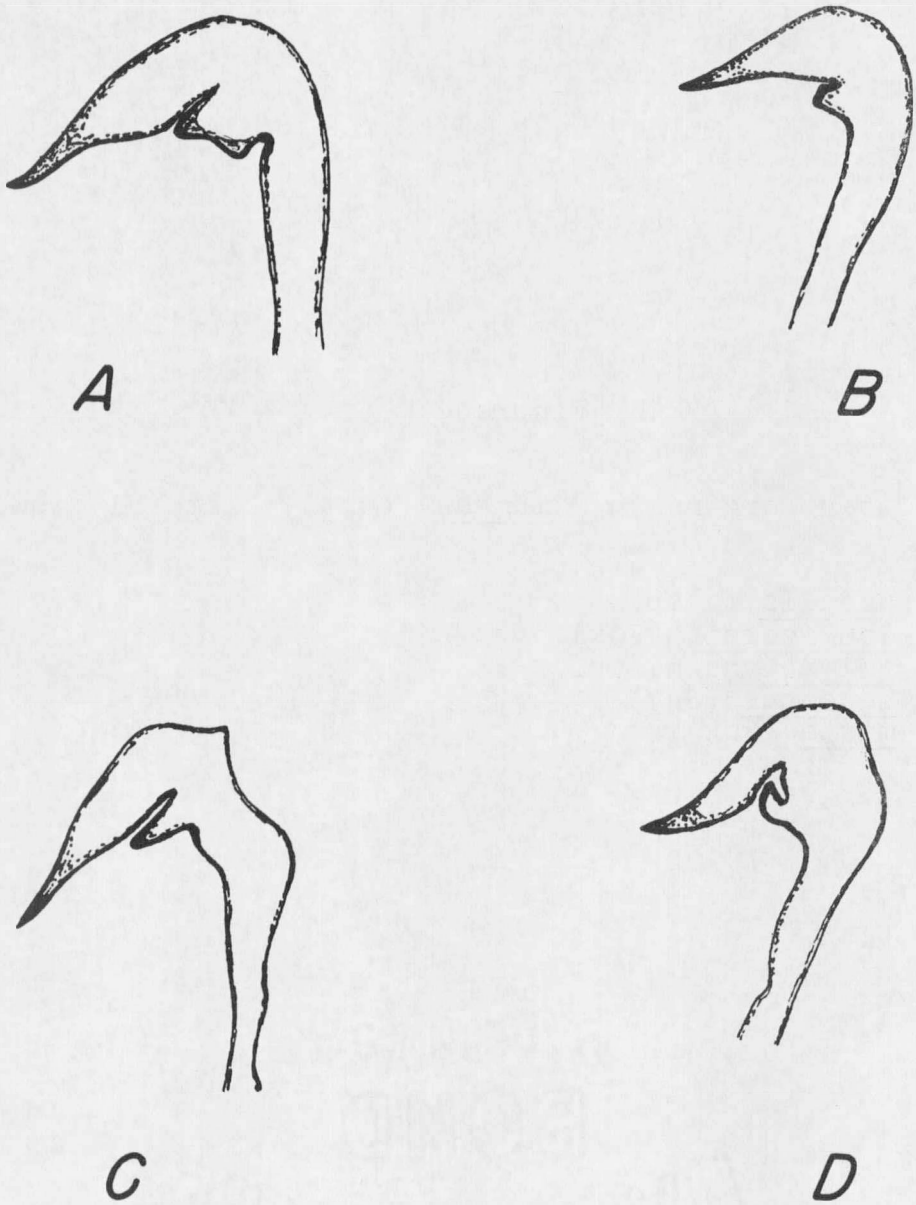

Figure 5

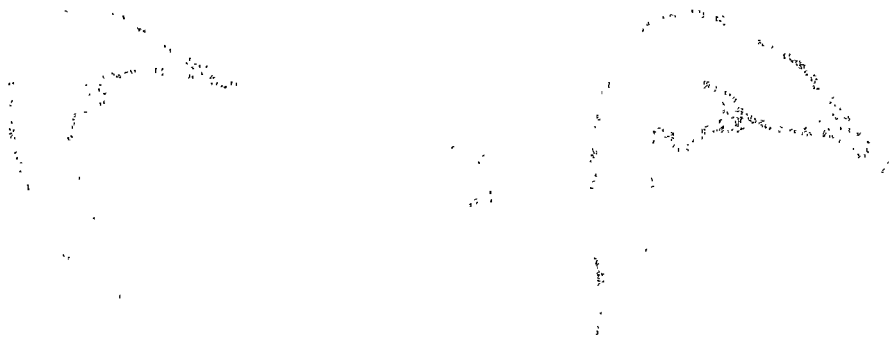

Figure 6

Intromittent organs in Mimumesa (cont.), lateral view.

E. M. sodalis n. sp.
F. M. longicornis (Fox)
G. M. columbiana n. sp.
H. M. leucopus (Say)
I. M. mixta (Fox)

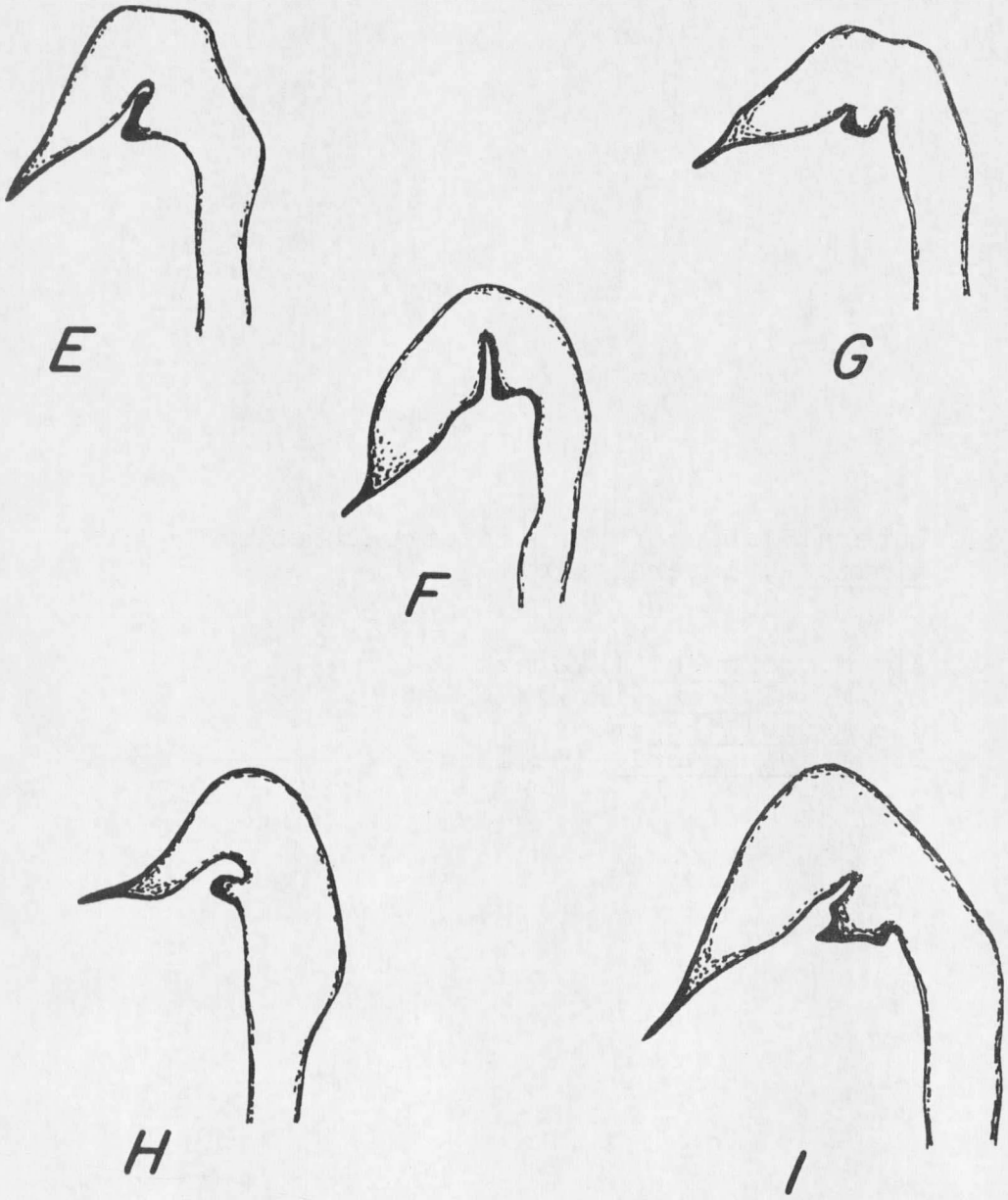

Figure 6

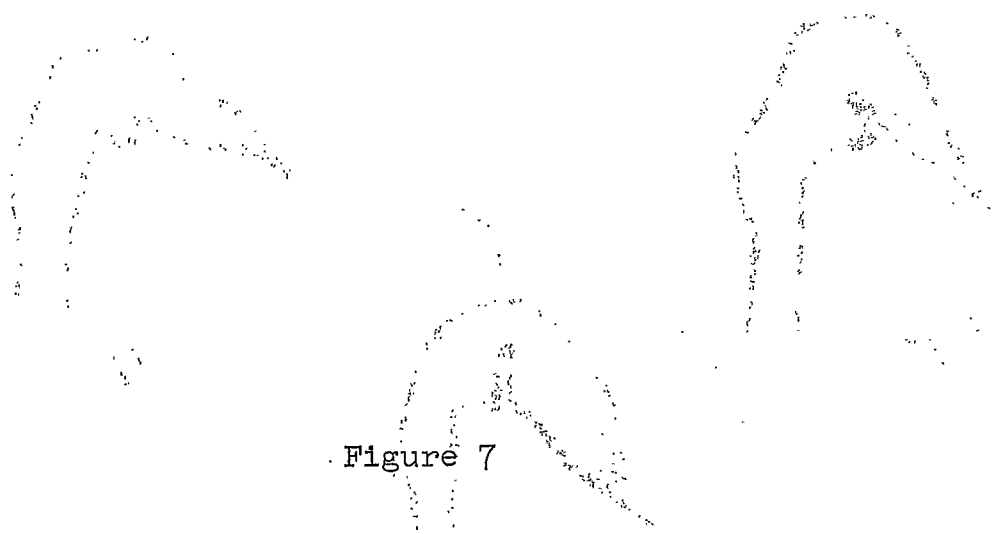

Figure 7

Lateral lobes of phallic structures in Mimumesa, lateral view.

A. M. johnsoni (Viereck)
B. M. clypeata (Fox)
C. M. mellipes (Say)
D. M. canadensis (Malloch)

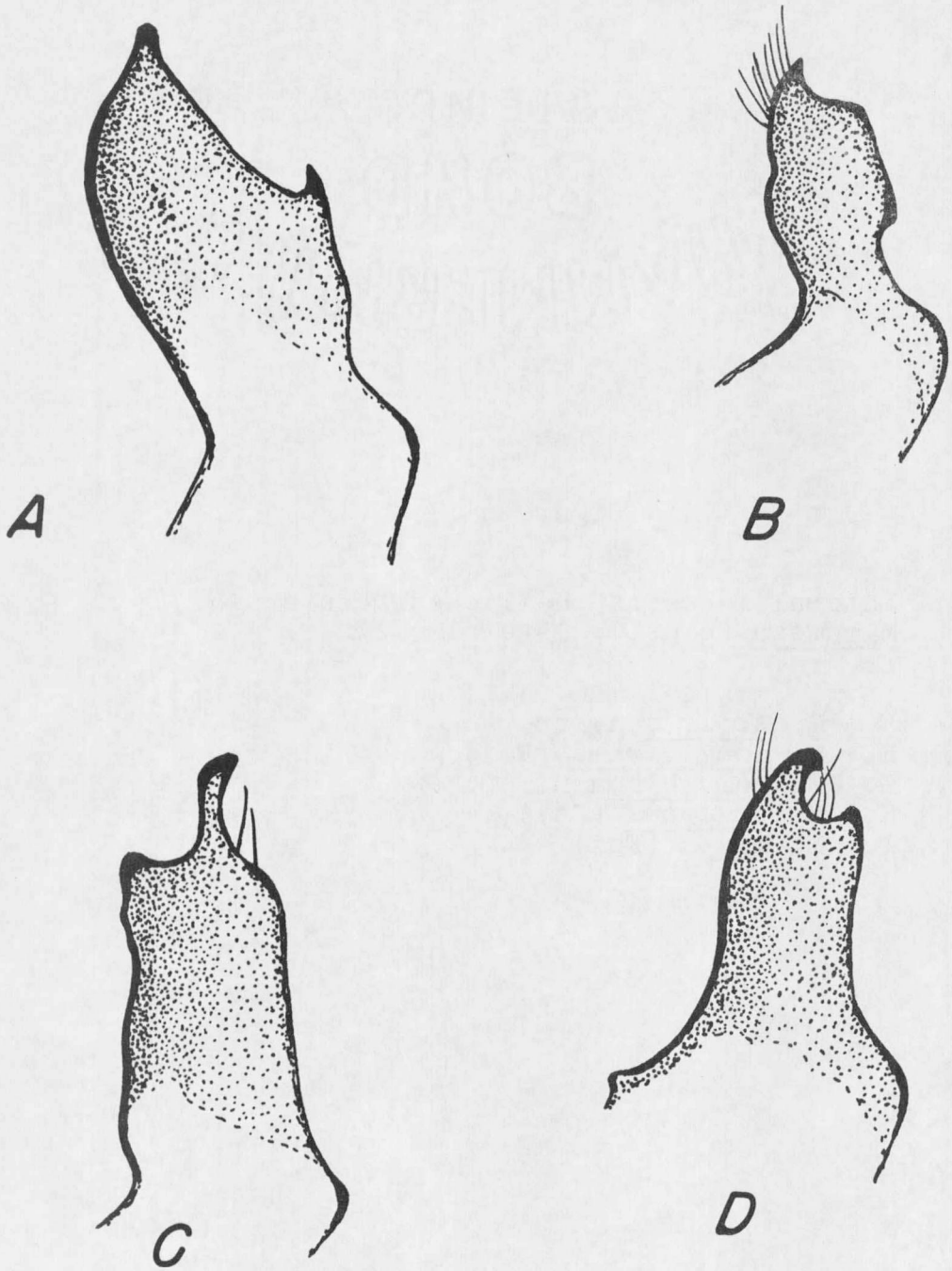

Figure 7

Figure 8

Lateral lobes of phallic structures in Mimumesa (cont.), lateral view.

E. M. sodalis n. sp.
F. M. longicornis (Fox)
G. M. columbiana n. sp.
H. M. leucopus (Say)
I. M. mixta (Fox)

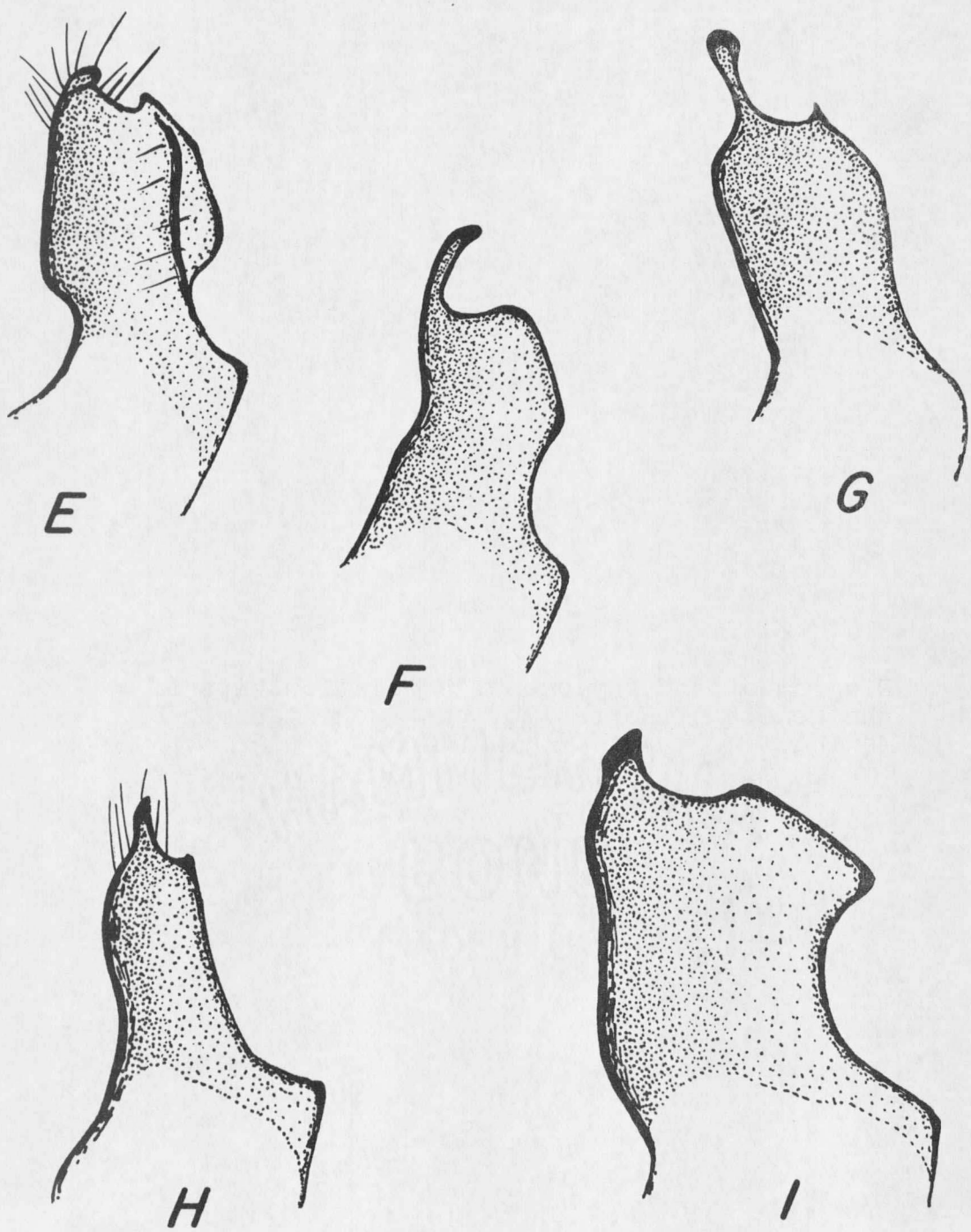

Figure 8

Figure 9

Diagram of the phylogenetic relationships of the genera of North American Psenini north of Mexico.

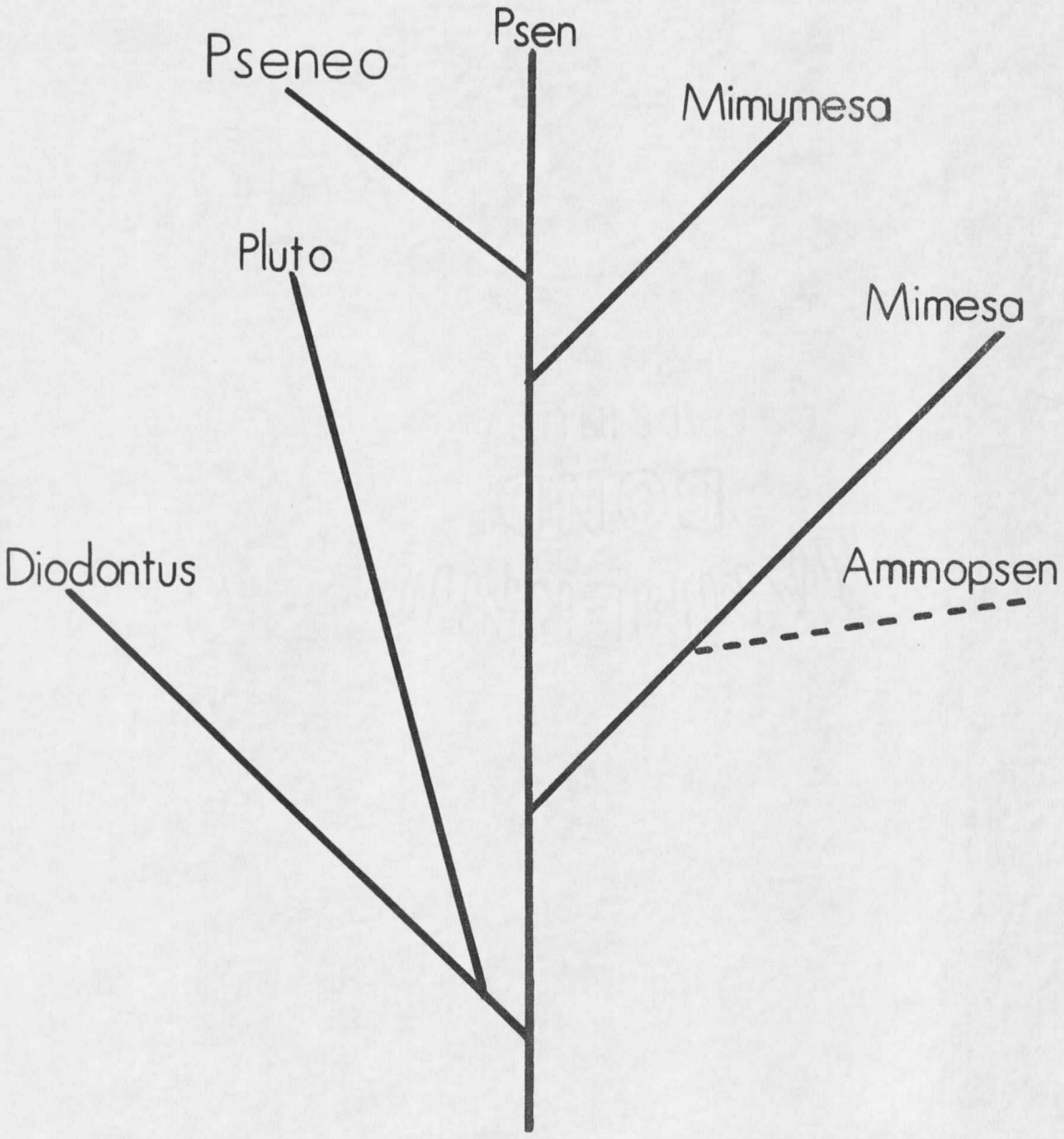

Figure 9