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## The Wasps and Bees of the Bimini Island Group, Bahamas, British West Indies (Hymenoptera: Aculeata)

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This paper on the bees and wasps of the Bimini Island group in the Bahamas has been prepared at the request of Dr. Mont A. Cazier, Chairman of the Department of Insects and Spiders, the American Museum of Natural History. It is based principally on material collected by Cazier and his associates during several visits to Bimini. A few specimens from other islands in the Bahamas that are in the collection of the Museum of Comparative Zoölogy have been included. Howard (1950) has presented an excellent general account of the Bimini group and detailed tabulation of the flora, and Cazier (1951, 1952) has published brief accounts of the two entomological expeditions in 1950 and 1951. Vaurie (1952) has published a detailed account of the collecting methods employed and the habitats explored in 1951, illustrated by photographs of the varied habitats. A profusely illustrated, popular, general account with emphasis on marine life of the Bimini group has been published by Zahl (1952).

All the families of wasps and bees collected on Bimini except the Chrysididae and Bethylidae are included. One species was collected in the former and five species in the latter family, and I have been unable to identify any of these to species. The Caribbean fauna in these groups is so poorly known and the named material in available collections is so scanty that I have considered it advisable to defer treatment of these species.

In the families treated herein, 34 species or subspecies have been collected on Bimini. One of these I have not identified specifically. It may be the male of a Cuban bee known definitely only from the unique female

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type, or it may be a new species. Of the remaining forms, 11 were unknown previously and are described as new species or subspecies. Eight of the new forms are known from Bimini only, while the other three are represented also by material from other islands in the Bahamas, and in one case from Cuba, too.

Of the 33 named species and subspecies recorded from Bimini, five species and nine subspecies are endemic on Bimini (43 per cent), eight species and one subspecies are common to the Bahamas and the West Indies (27 per cent), seven species and one subspecies are common to the Bahamas, West Indies, and at least Florida in continental America (24 per cent), and only two species are common to the Bahamas and at least Florida in continental America (6 per cent). Comparable percentages as recorded by Cazier (1952) for 19 buprestids and by Rindge (1952) for 52 butterflies are, respectively, 52 and 31 per cent endemic to Bahamas, 11 and 27 per cent common to Bahamas and West Indies, 26 and 36 per cent common to the Bahamas, West Indies, and Florida, and 11 and 6 per cent common to the Bahamas and Florida.

Despite the small number of Insecta reported on from Bimini, a general pattern of relationship is becoming apparent. Radical departures from this pattern should be scrutinized carefully, for they may indicate that the fauna in the group with aberrant distribution is rather poorly known in the adjacent West Indies, that a large number of adventive species are present, or that the group has a very unusual type of dispersal across water barriers. The normal faunal composition may be summarized briefly as a rather large number of endemics (25 to 50 per cent); a smaller percentage of Antilles forms (10 to 30 per cent), many of which, at least in the aculeate Hymenoptera, are known from Cuba and the Bahamas only; some widely distributed forms in the Neotropical region including Florida (25 to 35 per cent); and, finally, a small number of forms common to Florida or continental United States and the Bahamas but not occurring elsewhere in the West Indies (5 to 10 per cent).

The physical factors resulting in this type of distribution on Bimini are believed to be as follows: (1) the Gulf Stream flows in a very deep channel between the Bimini group and the Florida coast about 60 miles to the west, diminishing the possibility of faunal exchange by "rafts"; (2) the prevailing winds are from the southeast during most of the year; and (3) the Bimini group is included in the Great Bahama Bank, which extends eastward and southward to within only a few miles of the Cuba coast with no parts of the Bank isolated by deep water for any great distance.

In the aculeate Hymenoptera the Bimini fauna is unquestionably most

closely related to that of Cuba. The Bimini group and Cuba share no fewer than five species, and four more of the Bimini forms represent discrete subspecies, of which the typical and only other subspecies occurs on Cuba alone. It is possible, too, that one or more of the five new species described from Bimini alone will be recognized eventually as only sub-specifically distinct from forms occurring in Cuba when the fauna of that island has been collected more thoroughly.

I have included in this paper only the forms occurring on the Bimini group, though some specimens identical with Bimini forms are recorded also from other islands of the Bahamas. The few species or subspecies from the Bahamas that have not yet been taken on Bimini are as follows:

#### FAMILY TIPHIIDAE

*Myzinum ephippium bahamense* Krombein: Described from Mariguana and Great Bahama Islands, Bahamas, in the Museum of Comparative Zoölogy.

*Myzinum eburneum* Krombein: Described from Rum Cay, Bahamas, in the Museum of Comparative Zoölogy.

*Myzinum apicale brevius* Krombein: Described from Rum Cay and New Providence Island, Bahamas, in the Museum of Comparative Zoölogy.

*Myzinum apicale eleuthera* Krombein: Described from Eleuthera Island, Bahamas, in the Museum of Comparative Zoölogy.

*Myzinum apicale jamaicense* Krombein: Recorded questionably from Turks Island, Bahamas, in the United States National Museum.

#### FAMILY SCOLIIDAE

*Campsomeris (Campsomeris) fulvohirta* (Cresson): I have seen a female from Nassau, New Providence Island, Bahamas, November, 1950 (N. L. H. Krauss), in the United States National Museum. The species was known previously only from Cuba and the Miami, Florida, area.

#### FAMILY VESPIDAE

*Polistes fuscatus maritimus* Bequaert: Described (1940, Jour. New York Ent. Soc., vol. 48, p. 25) from a unique female from Mangrove Cay, Andros Island, Bahamas, in the Museum of Comparative Zoölogy.

*Polistes major major* (Beauvois): Recorded from Eleuthera Island, Bahamas, by Bequaert (1936, Ent. News, vol. 47, p. 11).

*Mischocyttarus (Kappa) cubensis* var. *maculipes* Richards: Described from one female from Bahamas.

*Zethus bahamensis* Bequaert and Salt: The female type from Nassau, New Providence Island, is in the United States National Museum. Presumably the specimen identified by Ashmead (1896) from Eleuthera Island as a variety of *Zethus aztecus* Saussure belongs here.

#### FAMILY POMPILIDAE

*Anoplius (Notiochares) amethystinus amethystinus* (Fabricius): I have seen a female from Nassau, Bahamas, in the Museum of Comparative Zoölogy, determined as *cubensis* (Cresson), a synonym of *amethystinus*, by Banks; Banks

(1928) records it from New Providence, Bahamas, as *Notiochares fulgidus* (Cresson), a misdetermination according to Evans (1951, Trans. Amer. Ent. Soc., vol. 76, p. 229). The typical subspecies has a wide distribution in South and Central America, West Indies, and Florida, Arizona, and California.

*Anoplius (Arachnophroctonus) americanus juxtus* (Cresson): Recorded as *Pompiloides subargenteus* (Cresson), a synonym of *americanus juxtus*, from Moraine Cay, Bahamas, by Banks (1928). This subspecies occurs in Cuba, Central America, and parts of the Lower Austral Zone in North America.

#### FAMILY SPHECIDAE

*Sceliphron fasciatum* (Lepeletier): Ashmead (1896) records two specimens from Eleuthera and Egg Islands. Neither is available for study.

*Ectemnius (Hypocraebro) auriceps* (Cresson): Pate records (1947, Trans. Amer. Ent. Soc., vol. 73, p. 22) a female from Cat Island, Bahamas, in the Museum of Comparative Zoölogy.

#### FAMILY HALICTIDAE

*Agapostemon femoralis* (Guérin): Ashmead (1896) records a male from Eleuthera Island. The identification needs confirmation, but I am unable to locate the specimen in the United States National Museum.

*Agapostemon poeyi* (Lucas): I have seen a series of three females and eight males from Nassau, New Providence Island, in the United States National Museum, determined by G. A. Sandhouse.

*Agapostemon viequesensis* Cockerell: I have seen a series of two females and one male from Nassau, New Providence Island, in the United States National Museum, determined by G. A. Sandhouse.

*Nomia robinsoni wickhamii* Ashmead, new status: This form, described originally as a species, is known only from the unique male type, in the United States National Museum, from Eleuthera Island. It is at most subspecifically distinct from *robinsoni* Cresson from Cuba, differing only in lacking ferruginous on the hind femora.

#### FAMILY MEGACHILIDAE

*Coelioxys rufipes* Guérin: I have seen a female from Cat Island, March 8, 1934, and one male from New Providence Island, February 1, 1934 (both Utowana Expedition), both in the Museum of Comparative Zoölogy, the first records from the Bahamas of this species of the Greater Antilles.

*Coelioxys* species: I have seen one female of an unidentified species, possibly new, from Cat Island, Bahamas, March 8, 1934 (Utowana Expedition), in the Museum of Comparative Zoölogy.

*Coelioxys* species: Ashmead (1896) records a species from Egg Island. The specimen is not available for study.

#### FAMILY APIDAE

*Anthophora* species: I have seen one female, the first record of this genus in the Bahamas, from Nassau, New Providence Island, Bahamas, June 28, 1904 (Allen, Barbour, and Bryant), in the Museum of Comparative Zoölogy, which probably represents a new species.

*Hemisia (Hemisia) versicolor* (Fabricius): I have seen one female, the first record of this species in the Bahamas, from Nassau, Bahamas, June 24, 1897 (C. J.

Maynard), in the Museum of Comparative Zoölogy. The species is widespread in the West Indies and is also present in southern Florida.

*Apis mellifera* Linnaeus: Specimens of the honey bee were not taken on Bimini.

Dr. Brown advises me that there are specimens from New Providence, Little Abaco, and South Eleuthera Islands in the Bahamas in the collection of the Museum of Comparative Zoölogy.

I plan to include the 24 forms listed above in a supplementary paper based on material from many more of the Bahamas to be obtained in a projected expedition by personnel of the American Museum of Natural History. Publication of keys to the Bahamas fauna is deferred until this later paper.

It is a pleasure to acknowledge my indebtedness to Dr. Mont A. Cazier for making available the material collected on Bimini by personnel of the American Museum of Natural History, who were guests at the Lerner Marine Laboratory during the summers of 1950 and 1951. Thanks are also extended to Miss Marjorie Statham who prepared the excellent illustrations accompanying this article; Dr. W. L. Brown, Jr., of the Museum of Comparative Zoölogy at Harvard College, for notes on the type of *Megachile bahamensis* Mitchell, and for arranging the loan of critical material from Cuba and the Bahamas in the collection of that institution; and Mr. J. A. G. Rehn, of the Academy of Natural Sciences of Philadelphia, for permission to study the Cresson types from Cuba deposited in that collection and the loan of the male allotype of *Coelioxys slossoni* Viereck.

## FAMILY SCOLIIDAE

### *Campsomeris (Campsomeris) trifasciata nassauensis* Bradley

*Elis trifasciata* (Fabricius), ASHMEAD, 1896, Bull. Lab. Nat. Sci., State Univ. Iowa, vol. 4, p. 17 (♂ from Eleuthera Island).

*Campsomeris (Campsomeris) trifasciata nassauensis* BRADLEY, 1928, Proc. Acad. Nat. Sci. Philadelphia, vol. 80, p. 322 (♀, ♂; Nassau Island, Bahamas; type in Cornell University).

The series examined from Bimini is fairly homogeneous with Bradley's type series in the extent and pattern of yellow markings. One female has a pair of small yellow spots on dorsum of pronotum and a central yellow spot on scutellum which are lacking in the other females. Males are rather variable in size, ranging from 10 to 19 mm. in body length and 8.5 to 14.5 in forewing length; females show much less variation in this respect, corresponding measurements being 14.5 to 16 and 10.5 to 13 mm.

This subspecies occurs only in the Bahamas so far as known, while typical *trifasciata* (Fabricius) occurs in the Greater Antilles and the Miami area, Florida.

SPECIMENS EXAMINED: Twelve females, 10 males; North Bimini; June 3 to October 7 (Cazier, Oliver, Rindge, C. and P. Vaurie). Thirteen females, 67 males; South Bimini; May to August 21 (Cazier, Gertsch, Rindge, C. and P. Vaurie).

#### FAMILY TIPHIIDAE

##### *Myzinum apicale cazieri*,<sup>1</sup> new subspecies

This subspecies of the polytypic *apicale* Cresson is the third to be described from the Bahamas. *Myzinum apicale eleuthera* Krombein was described from Eleuthera Island, and *M. a. brevius* Krombein from Rum Cay and New Providence Island; a female from Turks Island in the eastern Bahamas has been identified provisionally as *M. a. jamaicense* Krombein. Typical *M. apicale* Cresson occurs on Cuba only, *M. a. jamaicense* Krombein is known definitely from Jamaica only, and *M. a. sulphureum* Krombein occurs on Hispaniola only. The female of *M. nitida* Smith recorded from Harbor Island by Ashmead (1896) presumably belongs to one of the subspecies discussed above. The specimen is not available for study.

In my revision of the West Indies Myziniinae (1942) the male of *a. cazieri* keys to typical *apicale*, agreeing with that subspecies in the pattern and extent of yellow maculations and in having the two apical abdominal tergites ferruginous. It differs in that normally only the last two abdominal sternites are ferruginous, rather than all but the first, and in having a perpendicular groove anteriorly on mesopleuron.

The female of *a. cazieri*, if the single specimen of that sex before me is typical, seems to be somewhat intermediate between typical *apicale* and *a. brevius* of the Bahamas. It has the sparser pronotal punctation of *a. brevius*, but agrees with typical *apicale* in having the pale maculations lemon yellow and in the pattern and extent of these maculations. It differs from both these forms and agrees with *a. eleuthera* in having more strongly infumated wings.

TYPE: Male; South Bimini Island, Bahamas; May, 1951 (Cazier and Gertsch), in the American Museum of Natural History. This specimen is 13 mm. long; forewing, 9 mm.

ALLOTYPE: Female; same data as type, in the American Museum of Natural History. This specimen is 12 mm. long; forewing, 9 mm.

PARATYPES: Twenty males; South Bimini Island, Bahamas; May,

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<sup>1</sup>For Mont A. Cazier, Chairman of the Department of Insects and Spiders, the American Museum of Natural History, and one of the collectors of the type series.

1951, two males (Cazier and Gertsch); June 10, 1950, one male (Cazier and Rindge); June 13, 1950, one male (Cazier and Rindge); June, 1951, four males (Cazier and Gertsch); June, 1951, nine males (Cazier, C. and P. Vaurie); July 27, 1951, three males (C. and P. Vaurie). Seven males; North Bimini Island, Bahamas; June 2, 1950, one male (Cazier and Rindge); June 3, 1950, five males (Cazier and Rindge); June 20, 1950, one male (Cazier and Rindge). One male; East Bimini Island, Bahamas; July 18, 1951 (P. and C. Vaurie). Paratypes have been placed in the United States National Museum, the American Museum of Natural History, Museum of Comparative Zoölogy, Academy of Natural Sciences of Philadelphia, and the author's personal collection. The paratypes vary in length from 10 to 16 mm., and the forewing length ranges from 7.5 to 11 mm.

#### FAMILY RHOPALOSOMATIDAE

##### *Rhopalosoma poeyi* Cresson

*Rhopalosoma Poeyi* CRESSON, 1865, Proc. Ent. Soc. Philadelphia, vol. 4, p. 59, text fig. 6 (♀, ♂; Cuba; type in Academy of Natural Sciences of Philadelphia).

The pair from Bimini recorded below agree in all essentials with the female type and male allotype of *poeyi* in the Academy of Natural Sciences of Philadelphia. The Bimini male has the ocellar triangle more heavily infuscated than does the type.

SPECIMENS EXAMINED: One female, one male; South Bimini; June 8, 1950 (Cazier and Rindge).

#### FAMILY VESPIDAE

##### *Polistes exclamans bilineolatus* Bequaert and Salt, new status

*Polistes bahamensis* var. *bilineolatus* BEQUAERT AND SALT, 1931, Ann. Ent. Soc. Amer., vol. 24, p. 796 (♀; New Providence Island, Bahamas; type in the American Museum of Natural History).

*Polistes exclamans* var. *bilineolatus* Bequaert and Salt, BEQUAERT, 1940, Jour. New York Ent. Soc., vol. 48, p. 14 (New Providence and Eleuthera Islands).

This subspecies is restricted to the Bahamas and is now known from New Providence, Eleuthera, and Bimini Islands. The other two Bahamas subspecies of *exclamans* Viereck are known from Andros Island (*Polistes exclamans bahamensis* Bequaert and Salt, new status) and from Acklin Island, Mariguana, Rum Cay, Crooked Island, Long Island, Watlings Island, and Cat Island (*P. e. picturatus* Bequaert and Salt, new status). The identity of the specimens from various of the Bahamas recorded

by Ashmead (1896) as *Polistes cubensis*, *P. americanus*, and *P. minor* is questionable. The specimens are not available for study.

SPECIMENS EXAMINED: Seventy-nine females, one male; South Bimini; May to August 18 (Cazier, Gertsch, Rindge, C. and P. Vaurie).

*Mischocyttarus (Kappa) cubensis* (Saussure)

*Polybia cubensis* SAUSSURE, 1854, Études sur la famille des vespides, vol. 2, p. 202, pl. 25, figs. 5, 6 (♀, ♂; Cuba; location of type unknown to me, but probably in Muséum d'Histoire Naturelle, Geneva, Switzerland).

I place the Bimini specimens with typical *cubensis* of Cuba and the southeastern United States, since they agree in coloration of the head, legs, and thorax. The Bimini series shows some variation towards var. *maculipes* Richards, described from a single female from an unspecified island in the Bahamas, in that each of the abdominal tergites and the first through fourth sternites have transverse yellow bands. Bequaert (1940, Ent. Amer., new ser., vol. 13, p. 140) records two females of typical *cubensis* from New Providence Island and from Bahamas.

SPECIMENS EXAMINED: Three females, two males; South Bimini; June 14 to August 4 (Cazier, Rindge, C. and P. Vaurie). One female; North Bimini; September 28 (Oliver).

*Pachodynerus (Pachodynerus) scrupeus* (Zavattari)

*Odynerus scrupeus* ZAVATTARI, 1912, Arch. Naturgesch., 78 yr., div. A, no. 4, p. 220 (♀, ♂; Cuba; type series in Turin and Berlin museums).

*Pachodynerus scrupeus* (Zavattari), BEQUAERT AND SALT, 1931, Ann. Ent. Soc. Amer., vol. 24, p. 786. BEQUAERT, 1948, Psyche, vol. 55, p. 111 (Cuba, and Cat Island, New Providence, Rum Cay, and Eleuthera in the Bahamas).

The female from Eleuthera Island recorded by Ashmead (1896) as *Odynerus tibialis* Saussure (a species now referred to *Pachodynerus*) may belong here but is not available for study.

SPECIMENS EXAMINED: Three females, six males; South Bimini; May to July 22 (Cazier, Gertsch, Rindge, C. and P. Vaurie). Two males; North Bimini; June to July 27 (C. and P. Vaurie). One male; Gun Cay; June (Cazier, C. and P. Vaurie).

*Pachodynerus (Pachodynerus) scrupeus* var. *bahamensis*  
Bequaert and Salt

*Pachodynerus scrupeus* var. *bahamensis* BEQUAERT AND SALT, 1931, Ann. Ent. Soc. Amer., vol. 24, p. 786 (♀; Mangrove Cay, Andros Island; type in Museum of Comparative Zoölogy). BEQUAERT, 1948, Psyche, vol. 55, p. 112 (♀, ♂; New Providence, Andros Island, Long Island, Watling Island, Rum Cay).



SPECIMENS EXAMINED: Two females; South Bimini; May to June (Cazier, Gertsch, C. and P. Vaurie). One female; Nassau, New Providence Island, Bahamas; November, 1950 (N. L. H. Krauss); in the United States National Museum.

## FAMILY POMPILIDAE

### *Pepsis marginata* Beauvois

*Pepsis marginata* BEAUVOIS, 1809, Insectes recueillis en Afrique et en Amérique, p. 94, pl. 2, figs. 2, 3 (♀, ♂; Santo Domingo; location of type unknown).

This species occurs also in the Greater Antilles and Florida; records from other localities in the United States are apparently misidentifications (see Hurd, 1952, Bull. Amer. Mus. Nat. Hist., vol. 98, p. 300).

SPECIMENS EXAMINED: Five males; South Bimini; May, 1951 (Cazier, Gertsch).

### *Pepsis saphirus* Beauvois

*Pepsis ruficornis* of authors, not Fabricius (see Hurd, 1952, Bull. Amer. Mus. Nat. Hist., vol. 98, pp. 287-288). BANKS, 1928, Harvard Biol. Lab. and Bot. Garden in Cuba, vol. 1, p. 3 (♀, ♂; Cuba, Bahamas, Haiti).

*Pepsis saphirus* BEAUVOIS, 1806, Insectes recueillis en Afrique et en Amérique, p. 39, pl. 1, fig. 4 (Santo Domingo; location of type unknown).

This species has a distribution similar to that of *Pepsis marginata*.

SPECIMENS EXAMINED: Two females, six males; South Bimini; May to August 20 (Cazier, Gertsch, Rindge, C. and P. Vaurie).

### *Anoplius (Arachnophroctonus) insignis bahamas*, new subspecies

#### Figure 1

The West Indies *Anoplius insignis* (Cresson) belongs to the *americanus* species group of the subgenus *Arachnophroctonus*. Superficially, in the abdominal coloration of both sexes and banded pronotum of the male, it resembles *americanus* (Beauvois) rather closely. Actually, on the basis of the male genitalia, it is quite distinct from both *americanus* and *moestus* (Banks), the two North American species belonging to the *americanus* group. The digiti are sparsely haired and are noticeably shorter than the aedeagus, whereas in *americanus* and *moestus* the digiti are densely haired and subequal in length to the aedeagus. The subgenital plate of *insignis* is more similar in shape to that of *moestus* than to that of *americanus*, but lacks the numerous perpendicular hairs. The

female of *insignis* is distinguished from that of both *moestus* and *americanus* by the bright golden reflections of the wings, the yellow band on pronotum, and the extremely dense silvery pubescence on front and clypeus.

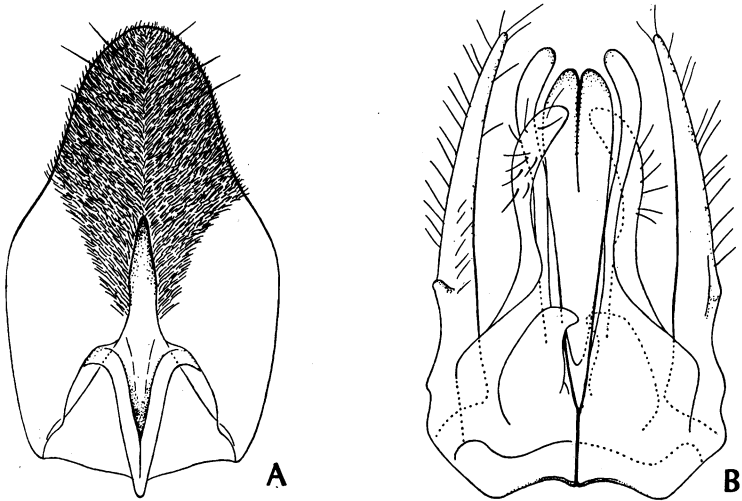


FIG. 1. *Anoplius (Arachnoproctonus) insignis bahamas*, allotype male. A. Subgenital plate. B. Genitalia (ventral at left, dorsal at right).

The Bahamas population represents a distinct race which differs from typical *insignis* of Cuba in having the yellow pronotal band half as wide as in the Cuba race. I have seen the female type of *insignis* Cresson (in the Academy of Natural Sciences of Philadelphia) and several other females and a male (in the Museum of Comparative Zoölogy) from Cuba. These Cuba specimens agree in the very broad yellow band on the pronotum; there is some variation in the extent of ferruginous on the abdomen, several females having the first three segments and basal two-thirds of the fourth red, while in the type the first four are entirely red as is also the base of the fifth tergite.

TYPE: Female; Nassau, Bahamas; February (Greenway), in the Museum of Comparative Zoölogy.

FEMALE: Length 10.5 mm.; forewing, 8.7 mm. Black; first three abdominal segments entirely ferruginous, fourth ferruginous except at apex; pronotum with a moderately narrow, yellow apical band, broadest at midline (about as wide here as the width of a flagellar segment) and extending laterally to include tubercles. Wings brownish by transmitted

light, the apical margin darker, with bright golden reflections. Front and clypeus with very dense silvery pubescence having a slight yellowish cast. Thorax and propodeum with a very few scattered erect hairs.

Clypeus twice as broad as high, the apical margin broadly and very slightly concave; front very narrow, the middle interocular distance 0.56 of the transfacial distance; eyes convergent above, the upper interocular distance 0.8 of the lower; ocelli forming a compact right triangle, the ocellocular distance 0.75 of the postocellar distance; vertex flat, not elevated above tops of eyes; first four antennal segments with ratio of lengths about as 6:2:8:7, the length of third segment equal to upper interocular distance.

Posterior margin of pronotum angulate; propodeum in profile short and convex, the posterior slope nearly flat; fore basitarsus with a comb of three spines; forewing with marginal cell about its length from wing tip, the third submarginal cell strongly narrowed above, width above about one-fourth of its width below; cubital and transverse median veins of hind wing interstitial; first tergite with a shallow median impression at base.

ALLOTYPE: Male; same data as type in the Museum of Comparative Zoölogy.

MALE: Length, 7 mm. (apical abdominal segments retracted); forewing, 6.5 mm. Black; coloration of body and wings similar to that of female.

Clypeus about twice as wide as high, the apical margin truncate; front moderately broad, the middle interocular distance 0.57 of the transfacial distance; upper interocular distance only slightly greater than lower interocular distance; ocelli forming a right triangle, the postocellar line slightly greater than ocellocular line; vertex flat, not elevated above tops of eyes; first four antennal segments with ratio of lengths about as 26:10:21:28, the upper interocular distance equal to combined lengths of third and fourth segments.

Posterior pronotal margin broadly and very shallowly angulate; median line of propodeum slightly impressed; last segment of fore tarsus not produced on inner side; venation as in female; abdominal sternites without hair brushes, with only a few scattered erect hairs; sixth sternite with a median U-shaped emargination posteriorly; genitalia and subgenital plate as figured (fig. 1).

PARATYPES: Female; South Bimini Island, Bahamas; June, 1951 (Cazier, C. and P. Vaurie), in the American Museum of Natural History. Female; same data as type, in the United States National Museum. Male; Moraine Cay, Bahamas; July 12, 1904 (Allen, Barbour, and

Bryant), in the United States National Museum. The female paratypes agree in all essential details with the description of the type given above; the male paratype is 6.5 mm. long; forewing, 5.5 mm.

*Anoplius (Pompilinus) scintillatus*, new species

The female of the present form has a rather marked similarity to the Nearctic *marginatus* (Say), agreeing with it in such details as head measurements and comparative development of the tarsal comb. It differs in the greater amount of ferruginous on the abdomen and very dense silvery pubescence on front and clypeus. The final status of *scintillatus*, i.e., as a subspecies either of *marginatus* or of some West Indies species such as *coruscus* (Smith), will depend on the characters of the males of *scintillatus* and material of some of the West Indies species known only from the original, inadequate descriptions. It does not agree with a Cuban female identified as *coruscus* (Smith) by Cresson.

TYPE: Female; South Bimini Island, Bahamas; July 19, 1951 (C. and P. Vaurie), in the American Museum of Natural History.

FEMALE: Length, 9 mm.; forewing, 7 mm. Black, the following ferruginous: pronotum with a narrow band anteriorly extending down onto sides, and posteriorly with a narrow band interrupted in middle, scutellum and postscutellum suffused with ferruginous in middle, first five abdominal segments broadly except for infuscations of varying widths posteriorly, mid and hind femora beneath at apices, mid tibia beneath, and hind tibia entirely except narrowly at apex. Clypeus and front with very dense silvery pubescence having a yellowish cast; thorax and propodeum with silvery, much less conspicuous pubescence and a few scattered erect hairs above. Wings brownish by transmitted light, the apices somewhat darker, and with brilliant golden reflections.

Clypeus about 2.7 times as wide as high, the apical margin truncate; front rather narrow, the middle interocular distance 0.59 of the transfacial distance; eyes weakly convergent above, the upper interocular distance 0.86 of the lower; ocelli forming a right triangle, the ocellocular and post-ocellar distances subequal; vertex flat, not elevated above tops of eyes; first four antennal segments with ratio of lengths about as 8:3:10:8, the length of third segment 0.7 of the upper interocular distance.

Posterior margin of pronotum very indistinctly angulate; propodeum in profile short and convex, with a faint longitudinal impression, the posterior slope almost flat; fore basitarsus with a comb of three spines, the apical one scarcely as long as apical width of segment; forewing with marginal cell about 1.8 times its length from wing tip, the third submarginal cell petiolate, with the length of petiole about one-third of

the distance between radial and cubital veins; hind wing with cubital vein basad of transverse median vein.

MALE: Unknown.

PARATYPE: Female; same locality as type, but June 10, 1950 (Cazier and Rindge), in the United States National Museum. This specimen does not differ in any essential details from the above description of the type.

## FAMILY SPHECIDAE

### *Tachytes (Tachytes) cubensis bimini*, new subspecies

The series of *cubensis* from Bimini is subspecifically distinct from a series of typical *cubensis* Cresson from Cuba in the Museum of Comparative Zoölogy. In the typical form the dense appressed pubescence is golden or brassy and the legs are entirely red except for coxae, trochanters, and extreme bases of femora, while in the Bimini race the dense appressed pubescence is paler, almost silvery, and the tarsi, tibiae, and only the extreme apices of femora are red. The female of the Bimini race is unknown, but presumably will be similar to the male in coloration and pubescence, for the two sexes of the Cuba race are identical in these respects.

TYPE: Male; North Bimini Island, Bahamas; June 2, 1950 (Cazier and Rindge), in the American Museum of Natural History. The type is 14.5 mm. long; forewing, 11 mm.

FEMALE: Unknown.

PARATYPES: Ten males; same data as type. One male; North Bimini; June, 1951 (Cazier and C. and P. Vaurie). Two males; North Bimini; July, 1951 (C. and P. Vaurie). Two males; East Bimini; June, 1951 (Cazier, C. and P. Vaurie). Paratypes are in the United States National Museum, the American Museum of Natural History, Academy of Natural Sciences of Philadelphia, Museum of Comparative Zoölogy, and the author's personal collection. The paratypes vary in length from 11 to 15 mm. and are otherwise very similar.

### *Tachysphex (Tachysphex) terminatus* (Smith)

*Larrada terminata* SMITH, 1856, Catalogue of hymenopterous insects in the . . . British Museum, vol. 4, p. 291 (♂; North America, Trenton Falls; type in British Museum).

This species has been known previously only from North America where it is transcontinental and ranges from Georgia and Arizona north to Ontario and British Columbia.

SPECIMENS EXAMINED: One male; South Bimini; August 9 (C. and P. Vaurie).

*Motes argentata* (Beauvois)

*Larra argentata* BEAUVOIS, 1811, Insectes recueillis en Afrique et en Amérique, p. 119 (♀; location of type unknown).

This species is widely distributed in the United States. It has not been recorded previously from the West Indies, but I have seen a short series of both sexes from Cuba (Viñales, Castillo de Jagua in Ceinfuegos, and Taco Taco) in the Museum of Comparative Zoölogy, in addition to one female from South Bimini, June, 1951 (Cazier and C. and P. Vaurie).

*Motes antilles*, new species

Figure 2

The present species is distinguished from the other Antilles species by the following characters: in both sexes the first four tergites with apical bands of silvery pubescence, dorsum of propodeum with a central ridge on at least basal half, dorsal and posterior surfaces of propodeum separated by a lamelliform ridge, posterior surface of propodeum with a few oblique ridges running upward and inward; in the male the femora and abdominal sternites unmodified, and clypeal lobe truncate at apex;

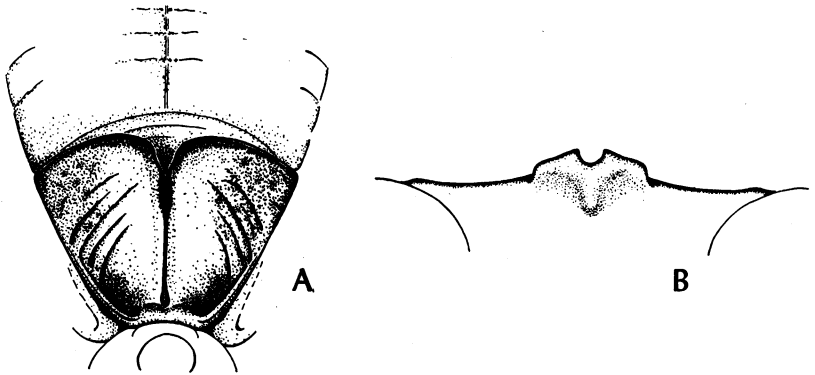


FIG. 2. *Motes antilles*, allotype female. A. Propodeum from a point above and behind. B. Clypeus.

in the female only the last two abdominal sternites shining and with coarse punctures, apical margin of clypeal lobe more or less truncate and with a narrow small emargination in middle, and pygidium bare and impunctate basally in middle. The species is represented by a short series

from the Bahamas and Cuba, and I am unable to find any distinctions of a subspecific nature.

**TYPE:** Male; South Bimini Island, Bahamas; June 13, 1950 (Cazier and Rindge), in the American Museum of Natural History.

**MALE:** Length, 8 mm.; forewing, 6 mm. Black. Vestiture everywhere short, silvery, dense on clypeus, face, sides of mesoscutum and propodeum, and on apices of first four abdominal tergites, rather inconspicuous elsewhere. Wings hyaline and with iridescent reflections, the apices somewhat infumated. Integument dull except as noted below.

Clypeus with median length one-fourth of the width, the disk slightly convex and not keeled; median lobe of clypeus truncate at apex, about one-third as wide as clypeus and with a narrow strip along apical margin shining and impunctate; in frontal view the head height (from apex of clypeus) two-thirds of the greatest width; interocular distance at anterior mandibular condyles 2.7 times the least interocular distance on vertex, the latter distance subequal to combined length of last two flagellar segments; ratio of lengths of scape, pedicel, first three and last two flagellar segments as 78:28:37:40:43:30:40; vertex with fine contiguous punctures.

Thorax with scattered, erect, short silvery hairs in addition to the silvery pubescence noted above; scutum with fine contiguous punctures, the scutellum and postscutellum equally finely but not so closely punctate; mesopleuron finely and somewhat irregularly striate; dorsum of propodeum with a central ridge extending from base almost to apex, the surface on either side of ridge finely rugose-reticulate, most of the rugulae running towards the sides and intersected by short irregular rugulae to form the reticulations; sides of propodeum with close, parallel, oblique rugulae; posterior surface separated from dorsal surface by a lamelliform ridge which is interrupted in middle and from lateral surfaces by a similar ridge on lower half, bisected by a narrow sulcus, the surface finely rugose-reticulate and with a few stronger oblique ridges running upward and inward.

Femora unmodified.

Abdominal sternites unmodified, without dense brushes or tufts of hair, the eighth broadly rounded at apex.

**ALLOTYPE:** Female; same locality data as type, but June 21, 1950 (Cazier and Rindge), in the American Museum of Natural History.

**FEMALE:** Length, 10.5 mm.; forewing, 8 mm. Similar to male in color and integumental sculpture, and with the following differences: apical margin of clypeal lobe subtruncate and with a narrow semicircular emargination in middle (fig. 2B); head height (from apex of clypeus)

0.7 of the greatest head width; interocular distance at anterior mandibular condyles 3.3 times the least interocular distance on vertex; vertex with short, dense, erect, silvery pile; last two abdominal sternites shining and with coarse punctures (closer on last than on fifth) except narrowly at sides where they have fine close punctures; propodeum as figured (fig. 2A).

PARATYPES: One female; New Providence Island, Bahamas; March 12, 1934 (Utowana expedition). One female; Arthurs Town, Cat Island, Bahamas; July 14, 1935 (W. J. Clench). One female; Gavilan, Santa Clara Province, Cuba; September 6, 1932 (B. B. Leavitt). One female; Castillo de Jagua, Cienfuegos, Cuba; September 5, 1930 (R. Dow). Paratypes are in the United States National Museum and Museum of Comparative Zoölogy.

The female paratypes differ from the above description of the allotype in minor details only: the length ranges from 11 to 12 mm.; the central ridge on dorsum of propodeum may be present on basal half only or may extend almost to apex. In the only specimen in which the base of the pygidium is exposed, there is a basal bare shining area, the rest of the surface being covered with short, close decumbent setae with sparse, interspersed, longer suberect setae, and with a few decumbent stronger setae at tip.

*Trypoxylon (Trypargilum) excavatum* Smith

*Trypoxylon excavatum* SMITH, 1856, Catalogue of hymenopterous Insects in the . . . British Museum, vol. 4, p. 380 (♀, ♂; Jamaica; type in British Museum).

The species has been recorded previously from Jamaica and Haiti.

SPECIMENS EXAMINED: Two males; South Bimini; June to August 4 (C. and P. Vaurie). One male; North Bimini; June (Cazier, C. and P. Vaurie).

*Chlorion (Ammobia) ichneumoneum fulviventre* (Guérin)

*Sphex fulviventris* GUÉRIN, 1830, in Duperrey, Voyage autour du monde . . . sur . . . La Coquille, Zoologie, vol. 2, p. 1.

*Sphex ichneumoneus* var. *fulviventris* Guérin, KOHL, 1890, Ann. Naturhist. Hofmus., Vienna, vol. 5, p. 431 (♀, ♂; Jamaica, Cuba, Haiti).

*Sphex fulvihirta* (!) ASHMEAD, 1896, Bull. Lab. Nat. Sci., State Univ. Iowa, vol. 4, p. 31 (Egg Island and Spanish Wells in Bahamas).

*Chlorion (Proterosphex) ichneumoneum fulviventris* (Guérin), FERNALD, 1906, Proc. U. S. Natl. Mus., vol. 31, p. 403 (♀, ♂; southern Florida, Bahamas, Cuba, Jamaica).

SPECIMENS EXAMINED: Four females, 22 males; South Bimini; May to August 11 (Cazier, Gertsch, Rindge, C. and P. Vaurie). Three fe-



males, one male; North Bimini; June 3 to October 7 (Cazier, Oliver, Rindge).

*Sceliphron jamaicense* (Fabricius)

*Sphex jamaicensis* FABRICIUS, 1775, *Systema entomologiae*, p. 347 (Jamaica; exact location of type unknown).

*Pelopoeus annulatus* CRESSON, 1865, *Proc. Ent. Soc. Philadelphia*, vol. 4, p. 135 (♀, ♂; Cuba; type in Academy of Natural Sciences of Philadelphia).

*Sceliphron (Pelopoeus) jamaicense* (Fabricius), KOHL, 1918, *Ann. Naturhist. Hofmus.*, Vienna, vol. 32, p. 114 (♀, ♂; Cuba, Jamaica, Haiti).

*Sceliphron jamicensis* (!) (Fabricius), PORTER, *Proc. U. S. Natl. Mus.*, vol. 70, art. 1, p. 17 (♀, ♂; Haiti, Bahamas, Cuba, Jamaica).

SPECIMENS EXAMINED: Five females; South Bimini; June to August 4 (Cazier, Gertsch, C. and P. Vaurie).

*Sphecius (Sphecius) hogardii bahamas*, new subspecies

This new subspecies from the Bahamas differs from typical *hogardii* (Latreille) of the Greater Antilles and southern Florida in having the abdomen in both sexes entirely red. In typical *hogardii*, which I have seen from Cuba, Santo Domingo, and southern Florida in collections of the United States National Museum, Museum of Comparative Zoölogy, and the Academy of Natural Sciences of Philadelphia, the last three or four abdominal segments are black in both sexes. The female recorded as *Stizus hogardii* by Ashmead (1896) from Eleuthera Island presumably belongs to this new subspecies. The specimen is not available for study.

TYPE: Male; South Bimini Island, Bahamas; June, 1951 (M. Cazier, C. and P. Vaurie), in the American Museum of Natural History.

The type male is 23 mm. long; forewing, 20 mm. long; and is entirely red.

ALLOTYPE: Female; Clarendtown, Long Island, Bahamas; July 29 (Clench), in the Museum of Comparative Zoölogy.

The allotype female is 33 mm. long; forewing, 27 mm. long; and is entirely red.

*Microbembex monodonta* (Say)

*Bembex monodonta* SAY, 1824, in Keating, *Narrative of an expedition to St. Peter's River . . . under . . . Long*, vol. 2, app., p. 335 (♂; Pennsylvania; type no longer in existence).

*Bembex ciliata* LEPELETIER, 1845, *Histoire naturelle des insectes, hyménoptères*, vol. 3, p. 279 (♂; West Indies; type supposedly in Spinola collection in Turin museum).

*Bembex argentifrons* CRESSON, 1865, *Proc. Ent. Soc. Philadelphia*, vol. 4, p. 141 (♀, ♂; Cuba; type in Academy of Natural Sciences of Philadelphia).

This species has been recorded from southern Canada, almost the entire United States, Central America, West Indies, and South America.

SPECIMENS EXAMINED: Fifteen females, 45 males; South Bimini, May to August 16 (Cazier, Gertsch, Rindge, C. and P. Vaurie). Six females, five males; North Bimini; June 1 to July 26 (Cazier, Rindge, C. and P. Vaurie).

*Bembix signata* (Linnaeus)

*Vespa signata* LINNAEUS, 1758, *Systema naturae*, ed. 10, vol. 1, p. 574.

*Monedula signata* (Linnaeus), ASHMEAD, 1896, *Bull. Lab. Nat. Sci., State Univ. Iowa*, vol. 4, p. 30 (Eleuthera Island).

This is a wide-ranging South American species occurring in the West Indies, Central America, and in Florida and California.

SPECIMENS EXAMINED: Fourteen females, 19 males; South Bimini; May to August 21 (Breder, Cazier, Gertsch, Rindge, C. and P. Vaurie).

*Epibembex insularis* (Dahlbom), new combination

*Monedula insularis* DAHLBOM, 1845, *Hymenoptera Europaea*, vol. 1, p. 186 (St. Thomas and St. Bartholomew).

This species has been recorded from Jamaica and Cuba in addition to the localities from which Dahlbom's type series came.

SPECIMENS EXAMINED: Two females, four males; South Bimini; June (Cazier, Gertsch, C. and P. Vaurie).

*Oxybelus analis bimini*, new subspecies

This subspecies is distinguished from specimens of typical *analis* Cresson from Cuba, the type in the Academy of Natural Sciences of Philadelphia and other specimens in the United States National Museum, by the reduced yellow or creamy and increased red markings.

TYPE: Male; North Bimini Island, Bahamas; June 3, 1950 (Cazier and Rindge), in the American Museum of Natural History.

MALE: Length, 3.8 mm.; forewing, 2.8 mm. Punctuation similar to that of typical *analis*, the color differing as follows: last three abdominal segments red; posterolateral creamy lines present only on first and second tergites; femora entirely black, tibiae with only a narrow creamy line on outer surface, hind tarsus dark except basitarsus creamy above.

ALLOTYPE: Female; South Bimini Island, Bahamas; June, 1951 (M. Cazier, C. and P. Vaurie), in the American Museum of Natural History.

FEMALE: Length, 5.1 mm.; forewing, 3.3 mm. Punctuation similar to that of typical *analis*, the color differing as follows: last three abdominal segments red; posterolateral creamy lines present only on first two tergites; legs entirely black except fore tibia suffused with ferruginous beneath.

PARATYPES: Male; same data as type, in the United States National Museum. Male; East Bimini Island, Bahamas; June, 1951 (P. and C. Vaurie), in the American Museum of Natural History. The topotypic paratype is almost like the type except that apex of fourth segment is also red. The paratype from East Bimini is similar to the type except that it is 4.8 mm. long and the first four tergites have creamy posterolateral lines.

## FAMILY COLLETIDAE

### *Colletes submarginatus* Cresson

*Colletes submarginata* CRESSON, 1865, Proc. Ent. Soc. Philadelphia, vol. 4, p. 167 (♀; Cuba; type in Academy of Natural Sciences of Philadelphia).

This species has not been recorded previously except from Cuba.

SPECIMENS EXAMINED: Three females, eight males; South Bimini; May to June 14 (Cazier, Gertsch, Rindge, C. and P. Vaurie).

### *Hylaeus formosus*, new species

The red basal abdominal segment, smooth propodeal enclosure, and griseous appearance separate *formosus* from *limbifrons* (Cresson) of Cuba. The several Florida species having red basal abdominal segments similar to the first segment of *formosus* are distinguished from it by the larger size, more coarsely sculptured propodeal enclosure, more strongly infumated wings, and in not having a griseous appearance.

TYPE: Female; Easter Cay,<sup>1</sup> Bahamas; June, 1951 (M. Cazier, C. and P. Vaurie), in the American Museum of Natural History.

FEMALE: Length, 5.1 mm.; forewing, 3.6 mm. Black, the following ferruginous: mandibles, clypeus except narrowly at base, lateral face marks which are gradually narrowed above and extend along inner eye margins to a point halfway between antennal scrobe and top of eye, legs including coxae, and first abdominal segment except narrowly at apex of tergite; the following eburneous: narrow line on collar scarcely interrupted in middle, posterior half of pronotal tubercle and base of tegula. Body with a definite griseous appearance due to the white decumbent vestiture which is somewhat denser than normal for the genus; pubescence particularly dense and feathery on sides of scutum, entire postscutellum and sides of thorax and propodeum; first tergite with a pair of narrow, short, posterolateral patches of very dense, decumbent hair. Wings hyaline, stigma and veins dark brown.

Relative proportions of width of head at apex of clypeus to its greatest width to total height to eye height as 7:12:11:9; inner margins of eyes

<sup>1</sup> Part of the Bimini Island group.

divergent above, the ratio of least interocular distance (near apex of clypeus) to interocular distance at level of antennal insertions to interocular distance at top of eyes as 13:18:20; length of antennal scape subequal to basal width of clypeus and one-third of the eye height; post-ocellar and ocellocular distances subequal, and slightly less than length of antennal scape; clypeus dull from fine lineolation and with scattered punctures; face below antennal insertions similarly sculptured; face above antennae confluent punctate; supraorbital foveae linear, elongate, subequal in length to antennal scape.

Thorax dull from fine lineolation; pronotal dorsum not carinate, rounded laterally, not at all produced or dentate; scutum with punctures separated from each other by about half the diameter of a puncture; mesopleuron similarly sculptured; scutellum more sparsely punctate, most of punctures separated from each other by about the width of a puncture; postscutellum, metapleuron, and sides of propodeum with smaller, quite dense punctures; enclosure of propodeum entirely smooth, with only very delicate lineolation.

Abdomen with first tergite shining and with scattered delicate punctures, the remaining tergites dull, with very delicate transverse lineolation and scattered delicate punctures.

MALE: Unknown.

## FAMILY HALICTIDAE

### *Halictus (Halictus) ligatus* Say

*Halictus ligatus* SAY, 1837, Boston Jour. Nat. Hist., vol. 1, p. 396 (♀, ♂; United States; type no longer in existence).

*Halictus Poeyi* LEPELETIER, 1841, Histoire naturelle des insectes, hyménoptères, vol. 2, p. 271 (♂; Cuba; type in Serville collection).

This widely distributed species occurs in southern Canada, all of United States, Cuba, Jamaica, and Central America south to Colombia. It has not been recorded previously from the Bahamas.

SPECIMENS EXAMINED: One female, three males; South Bimini; May and June (Cazier, Gertsch, C. and P. Vaurie).

### *Halictus (Chloralictus) parvus* (Cresson)

*Panurgus ? parvus* CRESSON, 1865, Proc. Ent. Soc. Philadelphia, vol. 4, p. 175 (♀, ♂; Cuba; type in Academy of Natural Sciences of Philadelphia).

This species has been known only from Cuba hitherto.

SPECIMENS EXAMINED: Three females, one male; South Bimini; June to July 22 (Cazier, C. and P. Vaurie). One male; North Bimini; July 16 (C. and P. Vaurie).

## FAMILY MEGACHILIDAE

*Megachile (Pseudocentron) poeyi alleni* Mitchell

*Megachile poeyi alleni* MITCHELL, 1927, Psyche, vol. 34, p. 48 (♀, ♂; Mangrove Cay, Andros Island, Bahamas; type in Museum of Comparative Zoölogy).

This subspecies was described from specimens from Mangrove Cay, Andros Island, Bahamas, and I have seen two males in the United States National Museum from that locality as well as the allotype male in the Museum of Comparative Zoölogy. I have also seen specimens from Bannermantown on Eleuthera Island (one female, six males, February 8), Clarendetown on Long Island (two males, July 24), Cat Island (six females, one male, March 8), New Providence Island (two females, March 12), and Concepcion Island (one female, one male, February 13), all in the Museum of Comparative Zoölogy. A series labeled Anguila Island (two females, one male) in the United States National Museum, Water Cay (four females) in the United States National Museum, and 8-Mile Rock, Great Bahama Island, April 16 (Clench) in the Museum of Comparative Zoölogy, all in Bahamas, agrees in coloration with typical *poeyi* Guérin from Cuba and Jamaica.

SPECIMENS EXAMINED: Sixteen females, two males; South Bimini; May to August 18 (Cazier, Gertsch, Rindge, C. and P. Vaurie). Two females, one male; North Bimini; June 3 to October 7 (Cazier, Oliver, Rindge, C. and P. Vaurie). One female, one male; Gun Cay; June (Cazier and C. and P. Vaurie).

*Megachile (Melanosarus) bahamensis* Mitchell

*Megachile bahamensis* MITCHELL, 1927, Psyche, vol. 34, p. 47 (♀; Mangrove Cay, Andros Island, Bahamas; type in Museum of Comparative Zoölogy).

*Megachile (Melanosarus) floridensis* MITCHELL, 1934, Trans. Amer. Ent. Soc., vol. 59, p. 349, 2 figs. on pls. 20, 21 (♀, ♂; Miami and Palm Beach, Florida; type in United States National Museum). New synonymy.

I have been unable to find any reliable characters to separate the series from Bimini recorded below from the type series of *floridensis* in the United States National Museum. The vestiture and punctuation of the females are identical, as are the male genitalia, retracted sternites, and modifications of the tarsi. I thought at first that the Bahamas population might be racially distinct in having more pale hair on the dorsum of the thorax in the males, but a series from Nassau, New Providence Island, in the United States National Museum shows variability in the amount of pale hair on the thorax. I have seen also one female from Arthurs Town, Cat Island, Bahamas, July 14, 1935 (W. J. Clench), in the Museum of Comparative Zoölogy.

A comparison of Bimini females with the original description of the unique type of *bahamensis* indicates that they are identical except that the type of the latter has the concavity of the first abdominal tergite divided by a sharp longitudinal ridge. This condition is perhaps a teratological phenomenon of some sort, for it is the only specimen of *Megachile* known to me in which this basal concavity is so modified. Dr. W. L. Brown has been kind enough to compare one of the Bimini females with the type of *bahamensis* Mitchell and considers that, except for the presence of the fine, slightly raised line dividing the concavity of the first abdominal tergite in Mitchell's type, the specimens "show only very minor differences of no importance."

SPECIMENS EXAMINED: Twenty-eight females, six males; South Bimini; June 21 to August 21 (Cazier, Rindge, C. and P. Vaurie). Twelve females, one male; North Bimini; June 1 to October 7 (Cazier, Oliver, C. and P. Vaurie).

*Megachile (Sayapis) apora*, new species

Figure 3

The original description of *Megachile armaticeps* Cresson from Cuba leaves little doubt that it is a species referable to the subgenus *Sayapis*. The present form may represent the opposite sex of *armaticeps*,<sup>1</sup> *sensu lato*, but since it may well be racially distinct, I consider it preferable to describe it as a discrete species.

TYPE: Male; South Bimini Island, Bahamas; August 6, 1951 (C. and P. Vaurie), in the American Museum of Natural History.

MALE: Length, 11 mm.; forewing, 8 mm. Black, the fore and mid tibiae beneath and at apex above, and mid and hind tarsi testaceous; fore tarsus creamy, the basitarsal scale stramineous, second segment beneath with an oval black spot. Hair on clypeus and face dense and ochraceous, thinner and ochraceous on vertex, white on temples; on thorax largely ochraceous above except brown on scutal disk, white on sides and beneath; erect hair on first three tergites and base of fourth ochraceous, black on apex of fourth, and fifth and sixth; second to fifth tergites with apical bands of dense, appressed, creamy hair; fore tarsal fringe yellowish, contrasting with white hair on outer surface of fore tarsus; mid tarsus with moderately dense, appressed, ochraceous hair, the hind tarsus very thinly haired. Wings tawny, the apices fuliginous.

Head wider than high, the greatest width 1.25 times the height, the eye height 0.8 of the total head height; eyes divergent above, the inter-

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<sup>1</sup> Cresson's species is still known only from the unique female type in the Gundlach collection in Havana.

ocular distance at apex of clypeus 0.85 of that at top of eyes; mandible tridentate at tip, the inferior triangular projection at basal third with the apex double as viewed from below; clypeus with apical margin broadly and shallowly emarginate; pedicel and first flagellar segment subequal in length, the apical one slightly dilated and flattened beneath; vertex flat, ocelloccipital and postocellar distances subequal and very slightly greater than ocellocular distance; temples with a concavity on lower fourth, margined above by two rows of bristles.

Fore coxa flat, at apex with a long, stout, curved spur, at base with three or four stout, subappressed spine-like setae; fore femur flattened beneath, and with scattered, modified, thick, long setae; fore tarsus (fig. 3A) modified as follows: basitarsus with an enormous shield, excavated beneath, along anterior margin which extends to apex of third segment, the second and third segments flattened, as wide as basitarsus less scale,

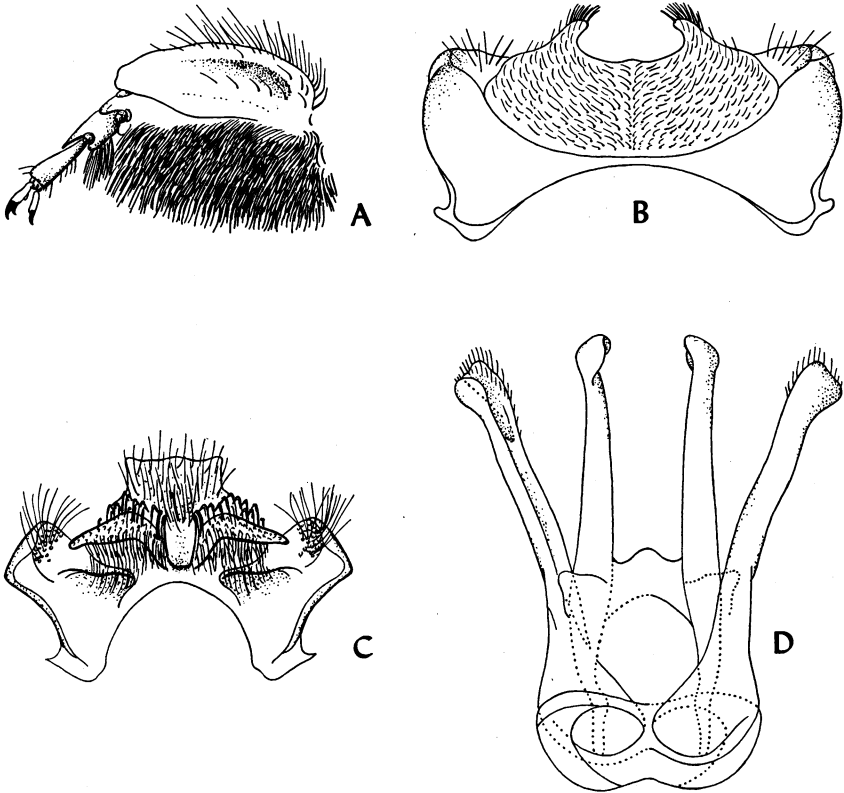


FIG. 3. *Megachile (Sayapis) apora*, paratype male from Bimini. A. Fore tarsus, outer surface (second segment not visible). B. Fifth sternite. C. Sixth sternite. D. Genitalia (ventral at left, dorsal at right).

produced somewhat at apices into a point; mid tarsus flattened and expanded to some degree, the basitarsal length 2.3 times its greatest width; basitarsus of hind tarsus long and slender, the length 3.1 times the greatest width.

Abdomen parallel-sided; third to fifth tergites deeply depressed laterally; sixth tergite with a deep pit just before the carina, the latter semicircularly emarginate, the morphological margin of tergite shallowly and broadly trisinate, lateral and median teeth not evident; seventh tergite with the apical margin in middle forming a low, oblique triangle; modified sternites and genitalia as figured (fig. 3B-D).

FEMALE: Unknown.

PARATYPES: Male; same locality as type; July, 1951 (C. and P. Vaurie), in the United States National Museum. One male; Concepcion Island, Bahamas; February 13, 1934 (Utowana expedition), in the Museum of Comparative Zoölogy. These specimens differ from the above description of the type only in being slightly larger—length 12–13 mm.; forewing, 8.5–9 mm.

*Coelioxys turbinata*, new species

Figure 4

This species is not represented in a short series of *Coelioxys* species from Cuba, in the Museum of Comparative Zoölogy, nor does it agree with either of the types of Cuba *Coelioxys* in the Academy of Natural Sciences, *uhlerii* Cresson and *producta* Cresson. I have not seen specimens of *tegularis* Cresson, known only from the unique female type in the Gundlach collection in Havana, but apparently it is at least subspecifically distinct because of the entirely black abdomen.

Of the available material, the male allotype of *slossoni* Viereck in the Academy of Natural Sciences of Philadelphia from Florida seems to be most closely related as evidenced by the similar semicircular callosity in front of the anterior ocellus, shape of pronotal lamella and scutellum, armature of fore coxa, and shape and villosity of sixth sternite. The Bahamas species differs in the somewhat sparser mesonotal punctures, in having the exposed part of the abdominal sternum entirely red, and in the shape of the eighth sternite which is narrower and only very slightly emarginate at tip.

TYPE: Male; South Bimini Island, Bahamas; June, 1951 (M. Cazier, C. and P. Vaurie), in the American Museum of Natural History.

MALE: Length, 10.5 mm.; forewing, 8 mm. Black, the following red: mandibles except narrowly at apices, tegulae, legs except coxae, first three tergites entirely, sides of fourth and fifth tergites, and all exposed sternites. Dense white pubescence present as follows: clypeus, face,



temples below, narrow transverse line anteriorly on scutum interrupted in middle, posterior margin of scutum, mesosternum, narrow lines on mesopleuron anteriorly and posteriorly, narrow fringes at apices of first to fifth abdominal segments and at bases of third to sixth tergites. Wings rather strongly infumated with brown except basal third.

Mandibles bidentate at apex, the lower tooth longer and stouter, inner margin with a large, blunt tooth halfway to base, inferior margin edentate; clypeus slightly convex, the apical margin broadly and shallowly concave; clypeus and face with small, close punctures; an impunctate, semi-circular callosity in front of anterior ocellus and partially enclosing it; an oblique impunctate strip, not raised, extending from posterior ocellus to inner eye margin; vertex with coarse, contiguous to subcontiguous punctures; ocellar area and vertex as figured (fig. 4A).

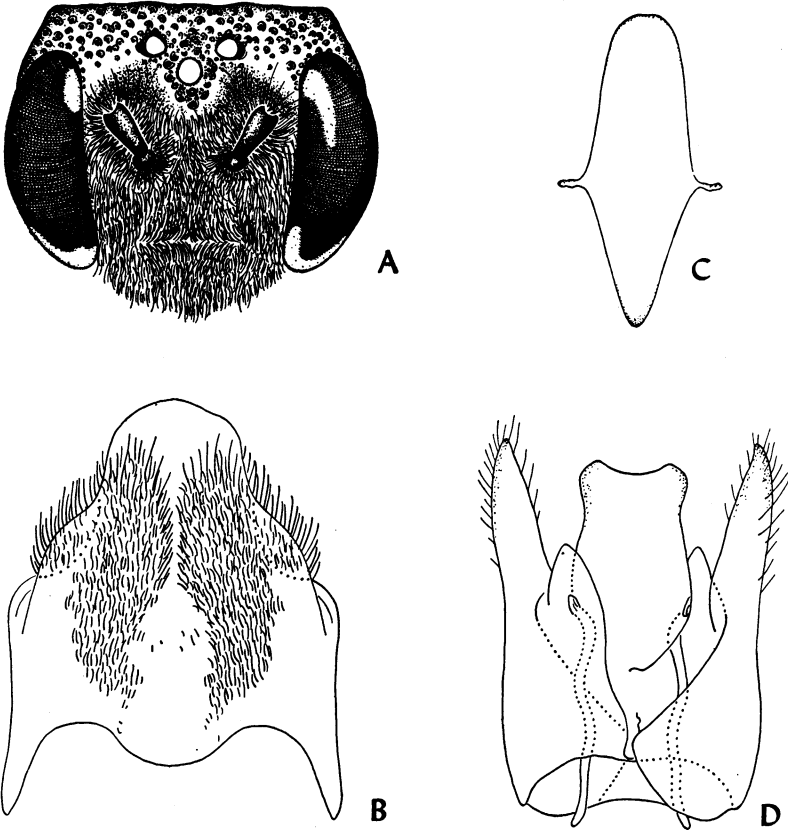


FIG. 4. *Coelioxys turbinata*, paratype male. A. Head from a point above and in front. B. Sixth sternite. C. Eighth sternite. D. Genitalia (ventral at left, dorsal at right).

Pronotum laterally with a short, erect lamella extending from side of dorsum across tubercle; dorsum of thorax and mesopleuron with large, contiguous to subcontiguous punctures; posterior margin of scutellum evenly rounded and with a lateral tooth extending backward slightly beyond the midpoint of the posterior margin; fore coxa with a stout, rather short, blunt tooth at apex beneath, legs otherwise unmodified.

Punctures on abdomen small and well separated; second to fifth tergites each with a median, transverse, impunctate band, these bands increasing in width posteriorly; second to fifth tergites with shallow furrows interrupted in middle just before these impunctate bands; sixth tergite with a small sharp tooth on each side at base, at apex with four sharp teeth, the upper pair shorter, stouter, more divergent, and separated by a shallow, more or less semicircular emargination, the lower pair longer, more slender, parallel, and separated by a deep, U-shaped emargination; genitalia and concealed sternites as figured (fig. 4B-D).

FEMALE: Unknown.

PARATYPE: Male; same data as type, in the United States National Museum. This specimen is 11 mm. long and agrees very well with the above description.

## FAMILY APIDAE

### *Melissodes cestus*, new species

#### Figure 5

The combination of the following characters serves to distinguish this species from the others occurring in the West Indies: vertex, disk of scutum, and scutellum with some dark hair in each sex; in both sexes the second tergite with two complete transverse bands of pale appressed hair, and the third and fourth with single complete bands; sixth and seventh tergites in male with a lateral tooth; and base of mandible, labrum, and clypeus yellow in male. In the male genitalia it is most similar to *foxi* Crawford from Jamaica but differs in that the lateral tooth on aedeagus is shorter, stouter, and blunter, and the sides of seventh sternite are rounded rather than straight.

TYPE: Male; South Bimini Island, Bahamas; May, 1951 (Cazier and Gertsch), in the American Museum of Natural History.

MALE: Length, 9.5 mm.; forewing, 8 mm. Black, the flagellum beneath and tarsi ferruginous, the following yellow: large spot at base of mandible, labrum and clypeus entirely. Wings clear.

Head wider than high, the greatest width 1.6 times the height from apex of clypeus to vertex; eyes diverging above, the interocular distance in front of anterior ocellus 1.3 times the interocular distance at greatest

width of clypeus; postocellar and ocellocular distances subequal; ratio of length of scape, pedicel, and first four and last flagellar segments as 20:6:8:37:30:28:30. Erect hair dense, white except that on vertex mostly dark brown.

Punctures on scutum subcontiguous anteriorly and becoming slightly sparser posteriorly in middle; scutellum about as densely punctate as scutum posteriorly; postscutellum densely punctate; sides of thorax about as densely punctate as scutellum; propodeal enclosure densely punctate laterally, a narrow median strip and posterior half impunctate; lateral surface of propodeum densely punctate, the posterior surface less densely punctate, almost bare near insertion of abdomen. Thoracic vestiture as follows: on sides and beneath about as pale as on most of head; above light ochraceous except posterior two-thirds of scutum less narrow margins, and scutellum except apex with dark brown hair.

Legs not modified except that mid and hind basitarsi are rather slender and long, about two-thirds of the length of the corresponding tibiae. Vestiture white on femora, light ochraceous on tibiae and tarsi.

Sixth and seventh tergites each with a basal tooth on sides; pygidial plate abruptly narrowed at mid point so that seventh tergite appears to have a second lateral tooth. Genitalia and seventh and eighth sternites as figured (fig. 5). Erect hair on basal two-thirds of disk of first tergite and sides of first four tergites white, quite dense on first tergite; dorsum of abdomen with four narrow, transverse, complete bands of appressed

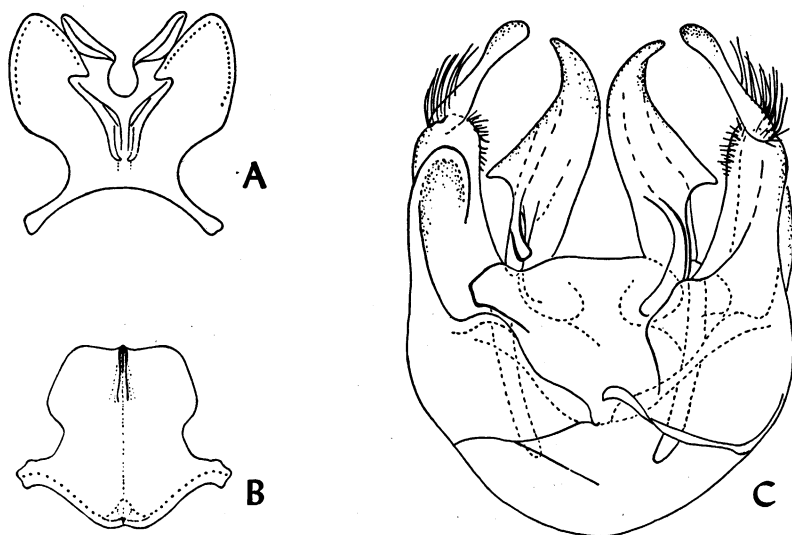


FIG. 5. *Melissodes cestus*, paratype male. A. Seventh sternite. B. Eighth sternite. C. Genitalia (dorsal at left, ventral at right).

ochraceous pubescence, a basal and a subapical on second tergite, and a subapical band each on third and fourth tergites; fifth tergite with a posterolateral spot of appressed ochraceous pubescence; subappressed hair on apical third of first tergite and on succeeding tergites black.

ALLOTYPE: Female; same locality as type, but June, 1951 (M. Cazier, C. and P. Vaurie), in the American Museum of Natural History.

FEMALE: Length, 11 mm.; forewing, 8.5 mm. Black, without ferruginous or yellow markings. Vestiture of body similar to that described for male except that the ochraceous is paler, and the dark hairs of vertex, scutum, and scutellum are black, and the fifth tergite has no pale pubescence. Vestiture of legs as follows: on femora mostly white; black or dark brown on fore and mid tibiae and all tarsi except hind basitarsus above; light ochraceous on hind tibia and hind basitarsus above except black around basitibial plate.

Head with greatest width 1.5 times the height from apex of clypeus to vertex; eyes slightly diverging above, the interocular distance in front of anterior ocellus 1.1 times that at greatest clypeal width; postocellar and ocellular distances subequal; ratio of lengths of scape, pedicel, first four, and last flagellar segments as 30:7:19:10:12:12:16.

Details of thoracic punctation about as in male.

PARATYPES: One male; same data as type. One female; same data as allotype, both in the United States National Museum. The paratypes do not differ from the above descriptions in any significant details.

#### *Hemisia (Hemisia) species*

The named material available for comparison is too limited for me to make a final determination of this species. Species of this genus are strong fliers, and it is quite possible that this species may be *fulviventris* (Cresson) from Cuba. I have not seen authentic material of *fulviventris* (Cresson), known at present only from the unique female type in the Gundlach collection in Cuba. Superficially the Bahamas males resemble very closely males of typical *inermis* (Friese) from the Canal Zone (kindly lent by C. D. Michener), and male cotypes of *i. pallidifrons* (Cockerell) from Honduras and *i. gualanensis* (Cockerell) from Guatemala in the United States National Museum. It differs from any of these in having fewer giant branched setae on genitalia and in having the tooth at base of clasper comparatively longer and more slender. Externally it differs in that the raised area of clypeus is flat, in having narrower lateral black marks on clypeus, in the lack of a narrow, curved pale streak on outer surface of fore tibia, and in having the pale markings on head ivory rather than yellowish.

SPECIMENS EXAMINED: One male; South Bimini; May (Cazier and

Gertsch). One male; Simon's, Long Island, Bahamas; July, in the Museum of Comparative Zoölogy.

*Xylocopa brasilianorum cubaecola* Lucas

*Xylocopa cubaecola* LUCAS, 1850, in de la Sagra, Historia física, política y natural de la Isla de Cuba, vol. 7, p. 776, pl. 19, fig. 8 (♀; Cuba).

SPECIMENS EXAMINED: Forty females, one male; South Bimini; May to August 17 (Cazier, Gertsch, Rindge, C. and P. Vaurie). Ten females; North Bimini; May to October 7 (Oliver, C. and P. Vaurie).

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