

HOWARD E. EVANS

*Bredin-Archbold-  
Smithsonian Biological  
Survey of Dominica:  
Aculeate Wasps  
(Hymenoptera: Scoliidea,  
Vespoidea, Pompiloidea  
Sphecoidea)*

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*Howard E. Evans* *Bredin-Archbold-*  
*Smithsonian Biological*  
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## ABSTRACT

Evans, Howard E. Bredin-Archbold-Smithsonian Biological Survey of Dominica: Aculeate Wasps (Hymenoptera: Scoliodea, Vespoidea, Pompiloidea, Sphecoidea). *Smithsonian Contributions to Zoology*, number 115, 19 pages, 20 figures, 1972.—The Aculeate wasp fauna of Dominica includes 52 species belonging to 10 families. Of these, 21 species belonging to 2 families of Bethyloidea were treated in an earlier paper; the remainder are treated here. These include 4 species of Tiphidae, 1 Mutillidae, 1 Scoliidae, 1 Eumenidae, 1 Vespidae, 7 Pompilidae, and 15 Sphecidae. Eight species are described as new. Two of these are Pompilidae: *Dipogon spangleri* and *Ageniella insulivaga*. The remaining six new species are Sphecidae: *Liris gryllidica*, *L. dominicana*, *L. sophiae*, *L. radulina*, *Trypoxylon layouanum*, and *Ectemnius dominicanus*. Three new synonymies are indicated: *Batazonus hookeri* Rohwer and *B. mundiformis* Rohwer are placed in the synonymy of *Poecilopompilus mixtus* (Fabricius) (Pompilidae), and *Larrada ignipennis* Smith is placed in the synonymy of *Liris labiata* (Fabricius) (Sphecidae). A single record of a member of the family Chrysididae (Bethyloidea) is also included. Of the 31 species covered in this paper, 10 are confined to Dominica (so far as presently known), 8 occur widely in the Lesser Antilles, 4 are predominantly Greater Antillean species, 3 are probably arrivals from South America, and 6 are widely distributed Neotropical species.

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This is a report on the aculeate wasps taken by various members of the Bredin-Archbold-Smithsonian Biological Survey of Dominica, West Indies. Records of a few other specimens found in various museums are also included. It is in no sense a revisional study, as this can scarcely be undertaken for a single island in an archipelago. The Aculeata of the West Indies are very imperfectly known, and there seems little immediate prospect of clarifying the fauna as a whole (which of course ties in with the equally imperfectly known continental tropical fauna). However, it is of some zoogeographic interest to record the genera and species represented on Dominica even if the names and status of some of these may have to be changed at a later date.

The number of species of wasps now known from Dominica stands at 52 (this includes 21 species of Bethyloidea covered by Evans, 1969). This figure compares rather favorably with Ashmead's (1894, 1900) for St. Vincent, the only other Lesser Antillean island to have been surveyed. Ashmead reported 46 species, and it is interesting to compare his numbers per family with those obtained in the present survey:

<i>Number of Species</i>	<i>St. Vincent</i>	<i>Dominica</i>
Bethylidae	11	19
Dryinidae	2	2
Chrysididae	0	1
Tiphidae	2	4
Mutillidae	3	1
Scoliidae	2	1
Eumenidae	1	1
Vespidae	2	1
Pompilidae	6	7
Sphecidae	17	15

In general, it can be said that St. Vincent and Dominica (and doubtless other of the Lesser Antilles) have many faunal elements in common (roughly a third of the species occurring on Dominica occur also on St. Vincent, though I cannot present an exact figure since I have not restudied all of Ashmead's material). A major difference between these two islands lies in the greater number of very small wasps on Dominica, especially Bethyloidea and the smaller Pompilidae and Sphecidae. Lacking on Dominica are several genera of larger wasps which are represented on St. Vincent: *Pepsis*, *Bicyrtes*, *Prionyx*, *Sceliphron*, and *Polybia*. On Antigua, a small and low island only about 150 miles north of Dominica, but that much closer to the Greater Antilles, I have collected species of *Pepsis*, *Prionyx*, and other genera

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not taken on Dominica. Thus it appears that Dominica has a much attenuated fauna of the larger wasps of the Greater Antilles and of South America, but a rather unusual development of very small wasps restricted to Dominica or to several of the Lesser Antilles. Of the 31 species covered in the present paper, 10 are only known from Dominica, 8 only from Dominica and other of the Lesser Antilles; only 4 can be characterized as predominantly Greater Antillean species and 3 others as probable recent arrivals from South America; the remaining 6 are widely distributed in the Neotropics.

In this paper the families are considered in the order in which they are listed above. Original biological data are presented for species of *Tachytes* and *Liris*, and briefer biological notes are included under several other species. Unless otherwise indicated, all specimens are in the collections of the United States National Museum (USNM), with a few duplicates at the Museum of Comparative Zoology (MCZ). In most cases I have omitted the years of collection, since virtually all this material was collected 1963–1966. Since only a few collectors were involved, I have used only their surnames. The following are the initials and surnames of the persons involved: D. M. Anderson, D. F. Bray, J. F. G. and T. M. Clarke, D. R. Davis, H. E. Evans, O. S. Flint, R. J. Gagne, A. B. Gurney, D. L. Jackson, P. J. Spangler, T. J. Spilman, G. C. Steyskal, and W. W. Wirth.

#### Family CHRYSIDIDAE

In my report on the Bethyloidea (Evans, 1969) I stated that the family Chrysididae was apparently not represented on Dominica. A single specimen has since come to my attention. This is a member of a subfamily (Adelphinae) which has been little studied, but the members of which probably attack the eggs of walking sticks (Phasmida); at least this is true of *Adelphe anisomorphae*, recently described from Florida by Krombein (1960).

#### *Adelphe* sp.

There is a single male from Pont Cassé, "Rd. F. W. Lake" (J. Maldonado C) in the collections of the United States National Museum. I am not aware that this genus has previously been reported from the West

Indies. There is, however, a male from Cuba in the collection of the Museum of Comparative Zoology. It is different from the Dominica male, and I would assume that each represents an undescribed species. However, there seems little point in describing either of them from a single specimen at this time.

#### Family TIPHIIDAE

##### *Tiphia dominicae* Allen

*Tiphia dominicae* Allen, 1967, p. 1; 1970, p. 254.

This species appears to occur throughout the island, from sea level to at least 2500 feet. Records are as follows: 1 ♂, Clarke Hall, Layou Valley, 10–17 February (Evans); 1 ♂, Roseau, 8 March (Evans); 10 ♂♂, 2 miles south of mouth of Layou River, 13 February, 5 March (Evans); 5 ♂♂, Fond Figs River, 400 feet, 9 February, 9 March (Evans); 18 ♂♂, Dleau Gommier, 1400 feet, 15 February–16 March (Evans, Wirth); 3 ♂♂, Freshwater Lake, 2500 feet, 6 March (Evans); 8 ♂♂, South Chiltern, 2–20 February (Evans, Wirth). Two females identified by Allen simply as *Tiphia* sp., may also belong here; one is from South Chiltern, the other from Fond Figs River, both collected by Evans on dates indicated above.

##### *Tiphia layouae* Allen

*Tiphia layouae* Allen, 1967, p. 3; 1970, p. 258.

This species has been taken only in coastal localities, up to about 400 feet elevation. Records are as follows: 40 ♂♂, Clarke Hall, January–March, May, November (Evans, Wirth, Spangler, Steyskal); 1 ♂, Hillsborough Est., 25 January (Wirth); 4 ♂♂, Fond Figs River, 400 feet, 25 January, 9 February (Evans, Wirth); 2 ♂♂, Long Ditton, American Museum of Natural History (AMNH).

##### *Tiphia laudata* Allen

*Tiphia (Tiphia) laudata* Allen, 1970, p. 267.

Allen has recently described this species from two females, one from Laudat, collected 20 June 1911 (AMNH), and one simply "Dominica," June–July 1913 (H. W. Foote) (USNM).

***Myzinum haemorrhoidale dominicanum* Krombein**

*Myzine haemorrhoidalis dominicana* Krombein, 1942, p. 339.

This wasp was described from 6 specimens labeled simply "Dominica, June–July 1913, H. W. Foote, Yale Expedition" and from one female from Long Ditton, 18 June 1911. New records are as follows: 17 ♀ ♀, 5 ♂ ♂, Clarke Hall, Layou Valley, January–June, October–November (Evans, Wirth, Flint, Spangler, Steyskal); 3 ♀ ♀, 1 ♂, Layou River, 12 March (from stomach of grey kingbird, R. Zusi); 1 ♂, South Chiltern, 19 February (Evans); 1 ♂, Roseau, 8 March (Evans); 1 ♀, 1 ♂, Macoucheri River, 20 February (Bray, Clarke); 15 ♂ ♂, Grande Savane, 21 March (Bray). This is a dark form restricted to Dominica; the more fully maculated *M. h. haemorrhoidale* occurs both north and south of Dominica (Puerto Rico, Martinique, St. Vincent).

**Family MUTILLIDAE*****Timulla dominica* Mickel**

*Timulla dominica* Mickel, 1938, p. 666.

Mickel regarded this as a full species, although it differs from *T. guadeloupensis* Mickel chiefly on minor color features. Since the male has not been described, a brief description of that sex is provided below. This species occurs widely except at high elevations. Records are as follows: 13 ♀ ♀, 20 ♂ ♂, Clarke Hall, Layou Valley, January–May, October–November (Clarke, Jackson, Gurney, Flint, Evans, Spangler, Wirth); 1 ♀, Grand Bay, 8 February (Evans); 1 ♀, 1 ♂, Springfield Est., 20–26 July (Flint); 2 ♀ ♀, 1 ♂, Fond Sophie, 2 October (Spilman, Spangler); 2 ♀ ♀, 1 ♂, South Chiltern, May, July, November (Anderson, Gurney, Flint).

**MALE.**—Length of forewing 7.0–7.5 mm. Head and thorax black, abdomen orange except first segment partially infuscated; antennae and legs black except tibial spurs pale; pubescence and erect pile of head and thorax whitish, especially dense along posterior margin of pronotum and on mesopleura and venter of thorax; abdomen with an abundance of suberect, orange pile; wings fuscous except pale at extreme base. Mandibles strongly dentate near the base. Clypeus with a transverse, polished area over-

hung by a semicircular, hirsute ridge. Antennal scrobes strongly carinate. Propodeum reticulate, except with a pair of basal carinae which meet behind, forming a small, tooth-like elevation. Apical abdominal tergite with a strong, broadly V-shaped ridge, behind which it is flat, apically bilobed; apical sternite with a pair of strong lateral denticles, other sternites unmodified.

**Family SCOLIIDAE*****Campsomeris dorsata* (Fabricius)**

*Tiphia dorsata* Fabricius, 1787, p. 279.

*Campsomeris dorsata*.—Wolcott, 1923, p. 46 (Puerto Rico).  
*Campsomeris (Dielis) dorsata*.—Bradley, 1964, p. 12.

I have made no attempt to include a complete synonymy for this large wasp, which ranges throughout Central America, northern South America, and up the Lesser Antilles to Puerto Rico. Antillean specimens tend to have the abdominal bands of the female somewhat paler than Continental specimens (more yellow than orange) and this is especially true of Dominica specimens. These are also small for the species, length of the forewing in both sexes averaging about 10 mm (9–11 mm in ♀ ♀, 7–13 mm in ♂ ♂). In contrast, in a series from St. Croix, forewing length averages 12.5 mm (11–14 mm) in both sexes.

This species was often encountered flying over sandy soil in localities near the coast; it is known to attack the larvae of Scarabaeidae (Wolcott, 1923). The males often appear in swarms, flying circuitously only a few inches above the sand. Dominica records are as follows: 27 ♀ ♀, 96 ♂ ♂, Clarke Hall, Layou Valley, January–May, July, September–November (Clarke, Flint, Wirth, Evans, Gagne, Anderson, Spangler); 2 ♀ ♀, 13 ♂ ♂, mouth of Layou River, January–March, October–November (Clarke, Gurney, Evans); 18 ♂ ♂, Roseau and vicinity, June, July, September (Flint, Spilman, C. Roys); 1 ♂, Grande Savane, February (Evans); 2 ♂ ♂, Portsmouth, February (Evans); 1 ♀, 10 ♂ ♂, Cabrit Swamp, November (Spangler); 1 ♀, Soufriere, June (Steyskal); 2 ♀ ♀, 4 ♂ ♂, Fond Figue River, 400 feet, February (Evans); 1 ♀, near Sylvania, October (Gurney); 1 ♀, 10 ♂ ♂, Fond Sophie, October (Spangler); 1 ♀, Fortune, October (Spilman); 18 ♂ ♂, Fond Colet, October (Spangler); 3 ♂ ♂, Anse

Bouleau, October (Spangler); 1 ♂, Glasham, August (Jackson); 2 ♂ ♂, mouth of Stewart River, February (Clarke).

#### Family EUMENIDAE

##### *Pachodynerus guadulpensis* (Saussure)

*Odynerus* (*Leionotus*) *guadulpensis* Saussure, 1852, p. 182.  
*Odynerus* (*Pachodynerus*) *guadulpensis* Saussure, 1875, p. 238.

I have seen specimens of this species from Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, Grenada, and Barbados. On Dominica it occurs widely except at high altitudes. Records are as follows: 1 ♀, Roseau, June; 1 ♀, 1 ♂, South Chiltern, February, December (Evans, Spangler); 11 ♀ ♀, 23 ♂ ♂, Clarke Hall, Layou Valley, January–May, October, December (Bray, Clarke, Evans, Flint, Steyskal, Spangler, Wirth); 1 ♀, 1 ♂, mouth of Layou River, March (Evans); 2 ♀ ♀, 2 ♂ ♂, Grand Bay, February, April (Evans, Flint, Wirth); 1 ♀, Fond Colet, October (Spangler); 3 ♂ ♂, Soufriere, June (Steyskal); 1 ♂, Pont Cassé, October (Spangler); 1 ♂, Fond Sophie, October (Spilman); 1 ♂, Giraudel, September (Spilman).

#### Family VESPIDAE

##### *Polistes crinitus multicolor* (Olivier)

*Vespa multicolor* Olivier, 1792, p. 691.  
*Polistes crinitus* var. *multicolor*.—Richards and Richards, 1951, p. 96.

This is the common "Spanish Jack" or "Jack Spaniel" of the northern Lesser Antilles. Richards and Richards (1951) described several nests. These were suspended from the eaves of buildings, from overhanging rocks, from trees, and from ferns. The comb is horizontal and is supported by a short, thick pedicel; the Richards found 118 cells in their largest nest. Their studies were conducted near Roseau.

Many specimens were taken by members of the Bredin-Archbold-Smithsonian Biological Survey. I have seen the following material: 2 ♀ ♀, Roseau Valley, 18 November 1920; 2 ♀ ♀, Roseau, June, September (Spilman, C. Roys); 1 ♀, Roseau River, 1 mile above Roseau, July (Flint); 3 ♀ ♀, Laudat, 11 June 1911; 8 ♀ ♀, mouth of Layou River, Jan-

uary, February, October (Evans, Gurney, Clarke); 18 ♀ ♀, Clarke Hall, January–May, July, October–November (Flint, Gagne, Gurney, Clarke, Spangler); 1 ♀, Springfield Est., June (Davis); 12 ♀ ♀, Pont Cassé and vicinity, April, November (Gagne, Spangler); 2 ♀ ♀, Dleau Gommier, May (Gagne); 5 ♀ ♀, Fond Figue River, January, February, April (Evans, Gagne, Wirth); 1 ♀, Trafalgar, June (Davis); 1 ♀, mouth of Stewart River, February (Clarke); 2 ♀ ♀, Holmwood Est., July (Jackson); 29 ♀ ♀, South Chiltern, February, December (Evans, Spangler); 1 ♀, Grand Bay, February (Evans); 1 ♀, Macoucheri, February (Wirth); 1 ♀, Grand Savane, February (Wirth); 1 ♀, Fond Colet, October (Spangler); 1 ♀, Fortune, September (Spilman).

#### Family POMPILIDAE

##### *Priochilus splendidulum opacifrons* (Fox)

*Salius opacifrons* Fox, 1891, p. 340 (♀, Jamaica).  
*Agenia compressa* Fox, 1891, p. 340 (♂, Jamaica).  
*Hemisalius opacifrons*.—Ashmead, 1900, p. 231 (St. Vincent).  
*Priochilus splendidulum opacifrons*.—Evans, 1966a, p. 160.

This form has an unusual distribution, having been described from Jamaica but later found to occur on St. Vincent, Grenada, and Dominica. It differs from *P. s. splendidulum* only in averaging somewhat smaller and being darker in coloration, the pubescence of the female being generally dull, non-silvery, the wings slightly smoky between the dark bands. I suspect that *opacifrons* is a polytopic subspecies. I have looked for it in vain in apparently suitable habitats in Puerto Rico, and it has not been taken on Hispaniola. The Jamaica population may have arrived via Central America, the Lesser Antilles populations via South America.

This is by far the most common pompilid on Dominica and is largely confined to forested areas at elevations above 500 feet where males and females are often abundant on low vegetation. Dominica records are as follows: 17 ♀ ♀, 11 ♂ ♂, Dleau Gommier, 1400 feet, February–March, May (Evans, Clarke, Steyskal, Wirth); 2 ♀ ♀, 12 ♂ ♂, Pont Cassé and vicinity, February–April, October–November (Evans, Davis, Gurney, Spangler); 17 ♀ ♀, 18 ♂ ♂, Fond Figue River, January–April, November (Evans, Wirth, Flint, Spangler); 5 ♀ ♀, Fortune, 14 September; 1 ♀, Clarke Hall, 7 March (Clarke).



***Poecilopompilus mixtus* (Fabricius)**

*Pompilus mixtus* Fabricius, 1798, p. 248.

*Poecilopompilus navus*.—Ashmead, 1900, p. 230 (St. Vincent; not *navus* Cresson, 1867, misidentification).

*Batazonus hookeri* Rohwer, 1915, p. 237 (♀, Puerto Rico; new synonymy).

*Batazonus mundiiformis* Rohwer, 1915, p. 238 (♀, Jamaica, St. Vincent; new synonymy).

I have seen specimens of this species from Jamaica, Hispaniola, Puerto Rico, Antigua, St. Kitts, Dominica, St. Lucia, and St. Vincent. It does not appear to be common on Dominica. I have seen only nine specimens: 5 ♀ ♀, 3 ♂ ♂, Clarke Hall, Layou Valley, January–March, October–November (Evans, Spangler, Wirth); 1 ♀, Pont Cassé, 27 September (Spangler).

***Anoplius (Arachnophroctonus) americanus ambiguus* (Dahlbom)**

*Pompilus ambiguus* Dahlbom, 1845, p. 452 (♀, Mexico).

*Pompilus coruscus* Smith, 1855, p. 156 (♀, Hispaniola).

*Pompilus juxtus* Cresson, 1865, p. 128 (♀, Cuba).—Ashmead, 1900, p. 230 (Grenada).

*Anoplius (Arachnophroctonus) americanus ambiguus*.—Evans, 1966a, p. 290 (synonymy of *coruscus* and *juxtus* indicated).

For a complete synonymy of this very widely distributed neotropical species, see Evans, 1966a. It has been taken on all West Indian Islands that have been well collected. On Dominica it has been taken only twice, both times in valleys near the west coast. The single male belongs to the form I called RH in the above 1966 paper (abdomen in large part rufous, with dense hair brushes below). Dominica records are as follows: 1 ♀, Roseau Valley, 9 October 1937 (O. W. Richards) (British Museum Natural History); 1 ♂, Clarke Hall, Layou Valley, 26 October 1964 (P. J. Spangler).

***Anoplius (Anoplius) simulans* (Cresson)**

*Pompilus simulans* Cresson, 1869, p. 367 (♂, Mexico).

*Pompilus interstitialis* Cameron, 1893, p. 195 (♀, Panama; synonymy by Evans, 1966a).

*Anoplius (Anoplius) simulans*.—Evans, 1966a, p. 340.

It comes as a great surprise to find this species on Dominica. The previously known range extends from Central Mexico to Panama, where it occurs chiefly

at moderate to high elevations. I have seen no other Antillean material of this species, and in fact the subgenus is represented in the West Indies only by *A. bermudensis* Banks and by the widely distributed neotropical species *A. fulgidus* Cresson. I am not aware that *simulans* has been collected in northern South America. In my 1966a paper I noted and figured variation in the male genitalia. The single male taken on Dominica has digiti similar to Figure 45 in that paper. Since Costa Rica males have digiti of this type (and Veracruz males slightly different digiti), it is my suspicion that *simulans* will be found to range at higher elevations through Colombia, Venezuela, Trinidad, and other of the Lesser Antilles (rather than through the Greater Antilles). These areas have been poorly collected, and *simulans* appears to be a rare species in all parts of its range.

The two specimens from Dominica were both taken at moderate elevations: 1 ♂, South Chiltern, 18–19 August (Jackson); 1 ♀, Pont Cassé, 27–30 November (Spangler). The female keys out well in my 1966a paper, the male less well because of the fact that the pubescence is mainly dark, silvery only on the front and clypeus, somewhat cinereous on the coxae and the apical half of the abdomen. In all structural details, however, it agrees well with Central American males.

***Aporus (Neoplaniceps) cariborum* Bradley**

*Planiceps euferalis*.—Ashmead, 1900, p. 231 (♂, St. Vincent; not *euferalis* Fox, 1891, misidentification).

*Aporus (Neoplaniceps) cariborum* Bradley, 1944, p. 106 (♂, St. Vincent).

Bradley based his description on a specimen studied by Ashmead and collected by H. H. Smith prior to 1900. I am not aware that the species has been taken since. Paul Spangler, a member of the Bredin-Archbold-Smithsonian Biological Survey of Dominica, collected four specimens, including the first known female of the species, which is described below. All four specimens (1 ♀, 3 ♂ ♂) are from Pont Cassé, collected by Spangler, 22–30 November 1964.

FEMALE.—Length 8 mm; forewing 6 mm. Entirely black; pubescence mainly dark brown, somewhat cinereous on lower front and on the coxae and pleura; body without long erect setae except for a few toward apex of abdomen. Forewings strongly infuscated, with an irregular pale streak passing across the wing

below the stigma; hind wings lightly infuscated. Clypeus a very short, arcuate band; mandibles not dentate below; antennae arising well below bottoms of eyes from a strong frontal prominence which overhangs the clypeus; eyes slender, covered with short hairs. Head  $.93\times$  as wide as high; middle interocular distance  $.77\times$  head width; upper interocular distance slightly exceeding lower; ocello-ocular line slightly exceeding postocellar line. Third antennal segment about twice as long as thick, slightly shorter than fourth, equal to only  $.36\times$  the upper interocular distance. Pronotal disc about twice as long as mesoscutum, with a median anterior impression; propodeum elongate, without rugae, abruptly declivous on posterior third; front femur  $2.3\times$  as long as their maximum width; claws simple, dentate. Second submarginal cell  $1.85\times$  as wide as high.

REMARKS.—The female differs from *A. (N.) funestus* Evans, 1966a (described from Martinique), in the following particulars: somewhat smaller; front much broader; head higher than wide; front femora more slender; second submarginal cell considerably wider.

#### *Dipogon spangleri*, new species

HOLOTYPE.—♀, Pont Cassé, Dominica, 12-14 October 1964 (P. J. Spangler), USNM 71505.

Length 6.0 mm; forewing 5.5 mm. Head black except mandibles and apical margin of clypeus stramineous; thorax ferruginous except posterior half of propodeum and lower pleura and venter black; abdomen black; antennae rufo-testaceous, weakly annulated with black, basal two segments fuscous, the scape with a stramineous spot beneath; legs black except front and middle femora in part ferruginous, front tibiae and tarsi mainly light ferruginous. Wings hyaline except forewing with a brown blotch covering the marginal cell, second and third submarginals, and outer part of third discoidal cell; stigma dark brown. Maxillary beard white, body setae sparse, pale, and inconspicuous except apical tergite very densely setose. Pubescence rather coarse, silvery except somewhat golden on vertex and on thoracic dorsum.

Clypeus  $2.5\times$  as wide as high, truncate below; malar space very short; head  $1.17\times$  as wide as high; middle interocular distance  $.59\times$  head width; upper interocular distance  $.83\times$  lower interocular distance;

ocello-ocular line and postocellar line subequal; third antennal segment  $5\times$  as long as wide, equal to  $.65\times$  upper interocular distance. Pronotum short, arcuate behind; propodeum smoothly rounded, its surface much more shining than the rather dull pronotum and mesonota; legs weakly spinose, the tibiae virtually devoid of spines. Stigma large; radial vein somewhat angulate at second transverse cubital vein; third submarginal cell, on its lower margin,  $1.2\times$  as wide as second. Abdomen with a rather long petiole which is somewhat hourglass shaped; groove on second sternite strongly developed.

REMARKS.—This species does not fit well into any of the three subgenera recognized for the Nearctic species. None of the North or Central American species known to me have a petiolate abdomen, but all the South American species do (I have seen specimens of *D. alastor* Banks, *D. ariel* Banks, and *D. neotropica* Kohl). Until the World fauna of *Dipogon* is better understood, I shall leave *D. spangleri* unassigned to a subgenus. So far as I know, it is the only *Dipogon* reported from the West Indies.

#### *Ageniella insulivaga*, new species

##### FIGURE 1

HOLOTYPE.—♀, South Chiltern, Dominica, 1600 feet, 19 February 1965 (H. E. Evans), USNM 71365.

Length 7.5 mm; forewing 7.3 mm. Black, front with violet reflections, thoracic dorsum with dark bluish reflections; scape light ferruginous, flagellum also of this color beneath, but dark above; legs wholly black; wings hyaline, very weakly darkened along outer margin, stigma dark brown. Pubescence very delicate, pale; erect setae also predominantly pale, rather numerous on front, vertex, temples, thoracic dorsum and pleura, coxae, propodeum, and apex of abdomen.

Mentum with several strong setae, but these not at all clumped; mandibles rather broad, with a single tooth on the upper margin, the surface shagreened on the inner apical margin; clypeus broadly truncate,  $2.15\times$  as wide as high; head  $1.22\times$  as wide as high; middle interocular distance  $.54\times$  head width,  $1.2\times$  lower interocular distance; upper interocular distance  $.93\times$  lower interocular distance; ocello-ocular line  $1.3\times$  postocellar line; antennae extremely slender, first four segments in a ratio of 10:3:16:14, segment three  $6\times$  as long as its apical

width. Pronotum short, its posterior margin broadly subangulate; postnotum angularly produced backward medially, the point continued as a short median basal sulcus on the propodeum; slope of propodeum gentle and even; legs slender and weakly spinose, hind tibia with a row of evenly spaced spines above, slightly serrate in profile at the base of the more proximal spines. Stigma large, about half as long as total length of marginal cell, the latter removed from the wingtip by considerably less than its own length; third submarginal cell  $1.6\times$  as long as second submarginal.

ALLOTYPE.—♂, Clarke Hall, Dominica, 21–31 March 1965 (W. W. Wirth; light trap), USNM.

Length 7.0 mm; forewing 6.0 mm. Black; mandibles and labrum testaceous; lower inner orbits stramineous; antennae black; legs black except front tibiae and tarsi testaceous; hind tibial spurs white, but front and middle spurs black; wings hyaline. Pubescence pale, inconspicuous except dense and silvery on clypeus and lower front; body largely devoid of erect setae except for some pale ones on the temples, propleura, and front coxae, and a very few on the propodeum; front and vertex with a few dark setae.

Clypeus  $2.1\times$  as wide as high, weakly rounded apically; middle interocular distance  $.57\times$  head width; upper interocular distance very slightly exceeding lower; ocello-ocular line  $1.6\times$  postocellar line; antennae slender, first four segments in a ratio of 14:5:20:21, segment three  $4\times$  as long as wide. Pronotum short, broadly subangulate behind; postnotum and propodeum as described for female; legs slender and weakly spinose; venational features as in female. Basal abdominal segment elongate, gradually expanded from a slender base; sixth sternite simple, with the usual apical emargination; subgenital plate broad and flat, tongue-shaped; genitalia as shown in Figure 1.

PARATYPES.—DOMINICA: 1 ♀, Dleau Gommier, 1400 feet, 2 March 1965 (Evans); 1 ♀, Savane Gommier, 6 August 1965 (Jackson), 6 ♀♀, 1 ♂, Grand Savane, 8 September 1965 (Jackson); 1 ♀, Clarke Hall, 3 May 1966 (Gagne); 1 ♀, Pont Cassé, 27 November 1964 (Spangler).

VARIATION.—The male paratype is considerably smaller than the allotype, the forewing measuring 4.8 mm. The females exhibit no variation worthy of note; forewing length varies from 7 to 9 mm; in some

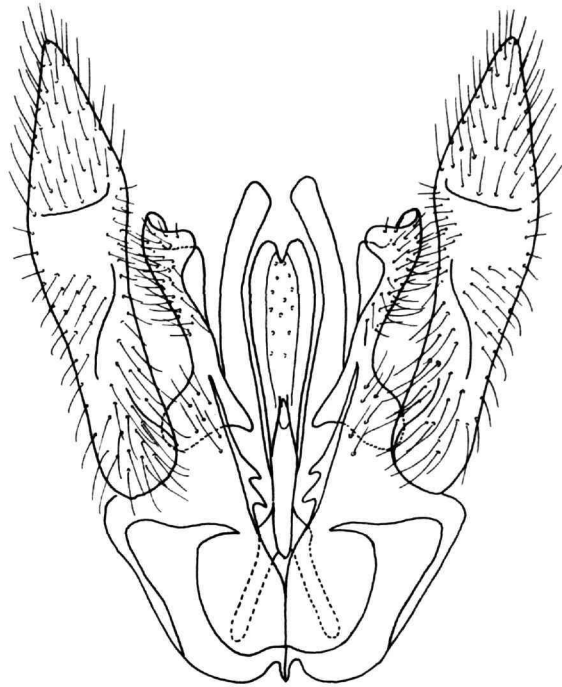


FIGURE 1.—Male genitalia of *Ageniella insulivaga*, new species, allotype.

the wings are slightly dusky and the scape slightly infuscated above.

REMARKS.—This species falls in the genus *Ameragenia* in the sense of Banks (1946), in the subgenus *Ameragenia* in the sense of Townes (1957). Its closest relative appears to be *A. ursula* Banks, described from the Dominican Republic, but that species has more serrate and spinose tibiae as well as very differently colored mandibles and clypeus. *A. insulivaga* is also reasonably close to several South American species of *Ameragenia*, such as *thione* Banks (Brazil), *seta-ceicornis* Fox (Brazil), and *varipes* Fox (Brazil, Ecuador). The neotropical Auplopodini are much in need of revision, both on the generic and specific levels.

BIOLOGY.—The female taken by Jackson at Savane Gommier bears the following note: "Several individuals (20?+) using same hole in dry clay bank, 3000 feet." This suggests that *insulivaga* may be a gregarious nester, like some of the Philippine Auplopodini studied by Williams (1919). This female and two of those taken by Jackson at Grand Savane were pinned with spiders. Norman Platnick of Harvard

University has determined these as Anyphaenidae, two of them probably *Aysha* sp. and one probably *Gayenna* sp. Only one is mature, and all three have all the legs amputated; hence it was not possible to identify them further.

### Family SPHECIDAE

#### *Sphex dorsalis* Lepeletier

*Sphex dorsalis* Lepeletier, 1845, p. 347.—Ashmead, 1900, p. 228 (St. Vincent).—Bohart and Menke, 1963, p. 127.

*Sphex singularis* Smith, 1856, p. 261.—Ashmead, 1900, p. 228 (St. Vincent).

*Chlorion (Ammobia) singulare*.—Krombein and Evans, 1954, p. 233 (biology, Florida).

Further synonymy for this widely distributed species is presented by Bohart and Menke (1963). I have seen West Indian material from Cuba, Hispaniola, Puerto Rico, St. Croix, Dominica, and Trinidad; Ashmead (1900) records it from St. Vincent. A female from Costa Rica in the Museum of Comparative Zoology is pinned with an adult male *Conocephalus* sp.; members of this genus are also reported as prey in Florida (Krombein and Evans, 1954).

I did not collect this species during my stay in Dominica in February and March, 1965, and most records are from later in the season, especially September–December. The following are the collection records: 5 ♀♀, 5 ♂♂, Roseau, June, September, October (Spilman, C. Roys); 1 ♂, Roseau River, 1 mile above Roseau, 23 July (Flint); 5 ♀♀, 1 ♂, Clarke Hall, Layou Valley, January, May, October (Spangler, Clarke); 1 ♂, Springfield, June (C. Roys); 2 ♂♂, Fond Sophie, 2 October (Spilman); 3 ♀♀, Concord, 4 December (Spangler).

#### *Stigmus thoracicus* Ashmead

*Stigmus thoracicus* Ashmead, 1900, p. 223 (♀, St. Vincent, Grenada).

Ashmead described this species from four females, three of which had the thorax wholly honey-yellow, while the fourth had the propodeum blackish. Several of the Dominica females have the thorax light ferruginous, the dorsum of the propodeum fuscous; others have the mesoscutum also fuscous, contrasting with the lighter scutellum and pronotum; still others have the entire thoracic dorsum fuscous. The single male collected is rather dark, both the dorsum and venter of the thorax being infuscated, the pleura alone light ferruginous. Otherwise it resembles the females closely aside from the usual sexual dimorphism of the genus.

This species has been collected primarily at moderate altitudes and in forested areas on Dominica. Locality records are as follows: 13 ♀♀, South Chiltern, 1600 feet, February (Evans, Wirth); 1 ♂, South Chiltern, 19 August (Jackson); 3 ♀♀, Dleau Gommier, 1400 feet, 15 February (Evans); 1 ♀, Savane Gommier, 2800 feet, 6 August (Jackson); 1 ♀, Melville Hall, 18 February (Evans); 2 ♀♀, 1.7 mile E. of Pont Cassé, 2000 feet, 4–11 March (Evans, Wirth).

#### Genus *Liris* Fabricius

This genus is represented on Dominica by 6 species, one of them among the commonest wasps on the island. The group is a difficult one taxonomically and, so far as I can judge, 4 of the species are undescribed. The Dominica species may be separated by the accompanying key.

### Key to Species of *Liris* Occurring on Dominica

#### FEMALES

1. Large species (forewing at least 9 mm long); head and thoracic dorsum with an abundance of erect, pale hair; abdominal sternite II with a strong median basal ridge.
  - L. fuliginosa* (Dahlbom)
- Smaller species (forewing under 9 mm); head and thorax smooth, without erect hairs; sternite II with at most a weak median ridge. . . . . 2
2. Wings vivid yellowish-brown, fuscous apically; abdominal sternites I–II dull, III at least somewhat shining, IV–VI strongly shining . . . . . *L. labiata* (Fabricius)
- Wings subhyaline, sometimes faintly tinged with yellow, darker along outer margin; sternites I–III dull, IV dull or shining, V and VI shining . . . . . 3

3. First abdominal segment unusually slender, gradually expanded posteriorly (Figure 9); propodeum elongate, the declivity weakly separated from the dorsal surface and not forming a strong angle with it; clypeus broadly truncate, with a weak median notch (Figure 19) ..... *L. dominicana*, new species
- First abdominal segment normal, i.e., rather abruptly expanded on basal half, the tergite nearly flat behind (Figure 8); propodeum with a strongly defined declivity; clypeus either truncate and with a strong median notch or somewhat rounded apically ..... 4
4. Abdominal tergites I-III with apical silvery bands, IV sometimes with a narrow or incomplete band; clypeus truncate, with a strong median notch (Figure 18); pygidial plate broader and more rounded apically ..... *L. gryllicida*, new species
- Tergites I-IV with strong, conspicuous silvery bands; clypeus somewhat rounded apically (Figure 15); pygidial plate more slender and pointed apically ..... *L. sophiae*, new species

## MALES

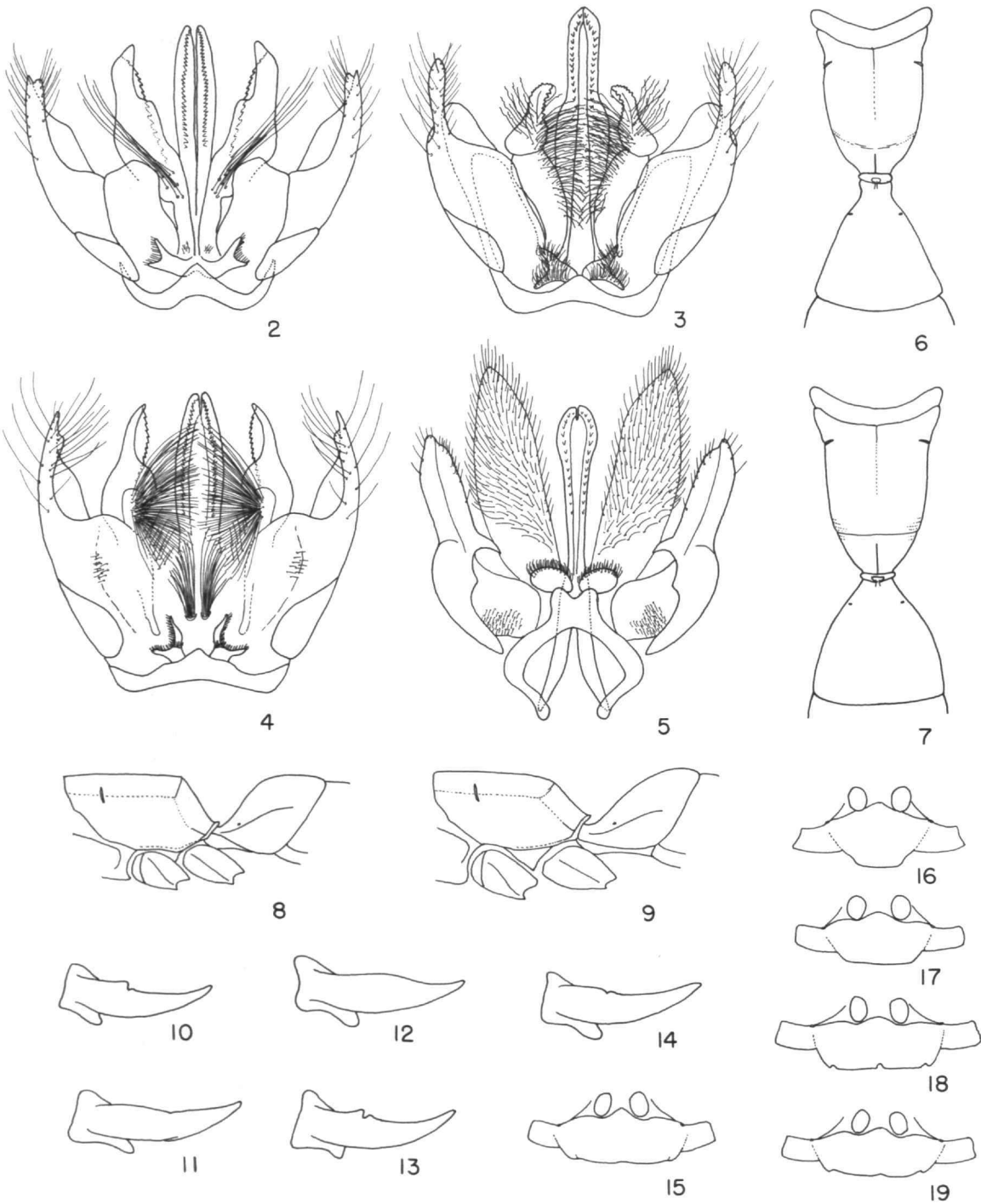
1. Abdominal sternites IV-VI, but especially V, with lateral brushes of dense setae; sternite II strongly humped medially; large species with much erect hair on the head and thorax. *L. fuliginosa* (Dahlbom)
- Abdominal sternites without dense lateral brushes of setae; sternite II unmodified; smaller species without erect hair on the head and thorax ..... 2
2. Third abdominal sternite produced apically, the process broad and arcuately emarginate; clypeus subangularly produced medially; wings strongly tinged with yellow-brown basally. *L. labiata* (Fabricius)
- Third abdominal sternite simple, not produced apically; clypeus truncate or weakly rounded; wings hyaline or nearly so, darker along apical margin ..... 3
3. Abdomen subpetiolate, the first segment very slender basally, gradually expanded posteriorly (Figure 6); propodeum elongate, the declivity not sharply separated from the dorsal surface; genitalia as shown in Figure 3. .... *L. dominicana*, new species
- Abdomen sessile, the first segment abruptly expanded on basal half, the tergite nearly flat behind (Figure 7); propodeum with the declivity well defined and forming an angle with the dorsal surface ..... 4
4. Antennae short, penultimate segment about  $1.5 \times$  as long as wide; median lobe of clypeus narrow, somewhat produced medially (Figure 16); aedeagus not compressed, armed with a double series of well-spaced teeth; volsellae much exceeding aedeagus (Figure 5). *L. radulina*, new species
- Antennae longer, penultimate segment at least nearly twice as long as wide; median lobe of clypeus wider, truncate or weakly rounded apically; aedeagus strongly compressed, armed with a double serrated edge; volsellae not much if any exceeding aedeagus (Figures 2, 4) ..... 5
5. Abdominal sternites III-V with fairly dense, short, suberect setae above which rise a few longer setae; spines of hind tibiae dark; mandibles without a tooth on inner margin (Figure 12); genitalia as in Figure 2 ..... *L. gryllicida*, new species
- Abdominal sternites III-VI somewhat depressed medially, smooth, with only a few scattered setae; spines of hind tibiae whitish; mandibles with a tooth on inner margin (Figure 10); genitalia as in Figure 4 ..... *L. sophiae*, new species

*Liris fuliginosa* (Dahlbom)

*Larra fuliginosa* Dahlbom, 1843, p. 138 (Cuba).  
*Larrada Dahlbomi* Cresson, 1865, p. 137 (Cuba).  
*Notogonidia fuliginosa*.—Wolcott, 1923, p. 44 (Puerto Rico).

This large, dark-winged *Liris* is evidently more widely distributed than has been appreciated. Dominica males resemble closely several Cuban males before me, but the wings are slightly less heavily infuscated

and the silvery bands on the first three abdominal tergites less conspicuous. Of the two females, one has the wings lightly infuscated and the silvery bands well formed, while the second has heavily infuscated wings and hardly any evidence of silvery bands. These specimens bear the following data: 1 ♀, 2 ♂♂, Clarke Hall, 12 February, 4 April, 1 June (Clarke, Davis, Steyskal); 1 ♀, Springfield Est., 20-26 July (Flint).



*Liris labiata* (Fabricius)

*Sphex labiata* Fabricius, 1793, p. 221 (Americae meridionalis Insulis).

*Larrada ignipennis* Smith, 1856, p. 288 (Hispaniola; new synonymy).

*Notogonidea ignipennis*.—Wolcott, 1923, p. 44 (Puerto Rico).

This species is not uncommon in sandy areas along the coast of Dominica. I have compared Dominica specimens with the type of *luteipennis* Cresson and found that they are quite different; also, they do not compare favorably with specimens of *rufipennis* Fabricius before me. They do, however, compare favorably with the type of *ignipennis* Smith (BMNH), which I have studied, and with homotypes of *labiata* Fabricius (USNM), selected by Dr. J. Van der Vecht. I see no reason for not regarding these two names as synonyms.

I have seen the following Dominica material: 2 ♀♀, 6 ♂♂, Clarke Hall, February, April, May, October (Flint, Spangler, Steyskal, Evans); 2 ♂♂, Cabrit Swamp, 3 November (Spangler); 1 ♂, South Chiltern, 8–10 December (Spangler).

*Liris gryllicida*, new species

FIGURES 2, 8, 12, 13, 17, 18

*Larra vinulenta*.—Ashmead, 1900, p. 225 (♂, ♀, St. Vincent, Grenada; not Cresson, 1865, misidentification).

**HOLOTYPE**.—♂, Clarke Hall, Layou Valley, Dominica, 4–7 February 1965 (H. E. Evans), USNM 71366.

Length 9.0 mm; forewing 7.0 mm. Black; forewings tinged with brown, with weak yellowish tints, apical margin more heavily infuscated; hind wings subhyaline, somewhat darkened apically. Body cov-

ered with a fine, appressed pubescence, somewhat dark dorsally, elsewhere silvery; front and clypeus with dense pubescence, mainly silvery but with golden reflections in certain lights; abdominal pubescence mainly dark, but tergites I–III with apical silvery bands, tergite IV also very narrowly silvery apically, and last two tergites mainly silvery.

Mandibles with the upper margin simple (Figure 12). Clypeus with a moderately broad, truncate median lobe (Figure 17); first four antennal segments in a ratio of 28:8:15:15, segment three  $2.2\times$  as long as its apical width; head  $1.28\times$  as wide as high; interocular distance at anterior mandibular condyles  $3.4\times$  the least interocular distance on the vertex, the latter distance very slightly greater than the length of the third antennal segment. Mesoscutum dull, with fine, contiguous punctures; scutellum with punctures slightly more widely spaced, but metanotum with extremely fine, close punctures; propodeum with median ridge distinct at extreme base, obsolescent behind, disc separated from posterior declivity by sharp carinae; surface of disc dull, minutely reticulate. Hind tibia ridged above, tibial spines dark in color; claws simple. Basal abdominal segment abruptly expanded on basal half, tergite I nearly flat on posterior half; venter unmodified except for the presence of dense, semierect, dark pubescence on sternites III–VI, with a few longer setae rising above it; subgenital plate emarginate; genitalia as shown in Figure 2.

**ALLOTYPE**.—♀, Clarke Hall, Layou Valley, Dominica, 20–28 February 1965 (Evans), USNM.

Length 8.0 mm; forewing 6.7 mm. Black; forewings tinged with yellowish on basal two-thirds, apical two-thirds tinged with brown, darker along extreme apical margin; hind wings subhyaline. Head and thorax with fine, appressed pubescence, somewhat dark dorsally but conspicuously silvery on the front, clypeus, temples, lower mesopleura, propodeum, coxae, and femora; abdominal pubescence mainly dark, but with silvery apical bands on tergites I–III.

Mandibles toothed on both outer and inner margins (Figure 13). Clypeus with a broad median lobe which is subdentate laterally and with a sharply defined median notch (Figure 18); first four antennal segments in a ratio of 33:5:17:20, segment three  $2.6\times$  as long as its apical width; head  $1.25\times$  as wide as high; interocular distance at anterior man-

FIGURES 2–19.—New species of *Liris*: 2–5, Male genitalia: 2, *Liris gryllicida*, paratype; 3, *L. dominicana*, paratype; 4, *L. sophiae*, holotype; 5, *L. radulina*, holotype. 6–9, Propodeum and base of abdomen: 6, dorsal view, *L. dominicana*, holotype ♂; 7, dorsal view, *L. radulina*, holotype ♂; 8, lateral view, *L. gryllicida*, allotype ♀; 9, lateral view, *L. dominicana*, allotype ♀. 10–14, Mandible: 10, *L. sophiae*, paratype ♂; 11, *L. dominicana*, paratype ♂; 12, *L. gryllicida*, paratype ♂; 13, *L. gryllicida*, paratype ♀; 14, *L. radulina*, paratype ♂. 15–19, Clypeus: 15, *L. sophiae*, allotype ♀; 16, *L. radulina*, holotype ♂; 17, *L. gryllicida*, holotype ♂; 18, *L. gryllicida*, allotype ♀; 19, *L. dominicana*, allotype ♀.

dibular condyles  $3.7\times$  the least interocular distance on vertex, the latter distance very slightly shorter than length of the third antennal segment. Features of thorax as described for male. Front basitarsus with four strong pecten spines plus several additional spines; hind tibia with a complete, sharp ridge above; claws simple except toothed at extreme base. Basal abdominal segment strongly expanded on basal half, apical half of tergite nearly flat, first three sternites dull, minutely punctate, sternite IV weakly shining and with slightly coarser punctures, sternites V and VI shining and coarsely punctate; pygidium with a smooth area basally, elsewhere with dense, appressed, pale spines above which rise a few suberect setae.

PARATYPES.—DOMINICA: 34 ♀♀, 36 ♂♂, Clarke Hall, January–May, October–December (Evans, Clarke, Steyskal, Flint, Spangler, Wirth, Davis, Gagne, Bray); 3 ♀♀, 4 ♂♂, mouth of Layou River, 18 February 1965 (Evans); 1 ♀, Grande Savane, 4–14 February 1965 (Evans); 2 ♀♀, 1 ♂, Roseau February, March, September (Evans, Spilman); 1 ♀, 2 ♂♂, Portsmouth, 23 February 1965 (Evans); 2 ♀♀, Woodford Hill, 27 February 1965 (Evans); 7 ♀♀, 3 ♂♂, Fond Figues River, 400 feet, February, March 1965 (Evans); 3 ♀♀, 1.5 miles N. Pont Cassé, 12–25 February 1965 (Evans); 1 ♂, 1.7 miles E. Pont Cassé, 4–11 March 1965 (Evans); 1 ♀, Pont Cassé, October (Spangler); 1 ♂, 2 miles NW. Pont Cassé, April (Davis); 1 ♀, Dleau Gommier, 1400 feet, 2 March 1965 (Evans); 2 ♀♀, Melville Hall, 18 February 1965 (Evans); 3 ♀♀, 1 ♂, South Chiltern, 19 February 1965 (Evans); 1 ♀, Mero, January (Clarke); 1 ♀, Springfield, July (Flint); 1 ♀, La Plaine, February (Bray); 2 ♀♀, 3 ♂♂, Cabrit Swamp, February, November (Spangler, Wirth); 1 ♀, Batali River, near Colihaut, May (Gagne); 1 ♀, Macoucheri, February (Wirth). ST. VINCENT: 8 ♀♀, 2 ♂♂ (H. H. Smith), BMNH, USNM. BARBADOS: 1 ♂ (J. R. Bovell), BMNH.

VARIATION.—Males vary in length from 6 to 9 mm, females from 6 to 10 mm. The wings vary somewhat in coloration, sometimes being nearly hyaline except for a darker band along the outer margin, at other times rather strongly suffused with brown or yellow, though in no case as conspicuously yellow as in *L. labiata*. In most specimens the median carina of the propodeum can be detected only at the extreme base, though in some it can be traced as a weak line

or impression nearly to the edge of the disc. The brushes on the male venter are subject to some variation; also, in some specimens the tufts of long setae arising from the base of the volsellae are much reduced. It is possible that some wear of these setae occurs during mating.

REMARKS.—Some of the St. Vincent specimens bear Ashmead's determination label: "*Larra vinulenta* Cress." I have studied *vinulenta* carefully, including the male genitalia, and I have seen no Lesser Antillean specimens assignable to it. I have also considered the possibility that *L. gryllicida* may be Smith's *trifasciata*, described from Hispaniola. I have studied the type of the latter species, a female (BMNH), but I have seen no males which may be associated with it. The type female does indeed resemble *L. gryllicida* closely, but the clypeus appears more narrow and rounded apically, and on this basis I tentatively consider it specifically distinct. Other features also suggest that *trifasciata* is specifically distinct from *L. sophiae* or *L. dominicanus*. Ashmead (1900) recorded *trifasciata* from St. Vincent, but it is probable that he was dealing with one of these other species.

BIOLOGY.—This species was seen commonly on Dominica, generally on or close to the ground in sandy places along streams. I did not find any nests, but took two females with prey, in both cases Gryllidae. At Clarke Hall, a female was taken as she rested on a banana leaf, straddling a cricket and holding it by the antennae with her mandibles. The cricket proved to be an immature *Orocharis* sp. (det. A. B. Gurney). At Fond Figues I took a female as she rested on a grass blade straddling an adult female cricket, *Cycloptilum* sp. near *trigonipalpus* (Rehn & Hebard) (det. Gurney). In both cases the antennae of the cricket had been amputated close to the base, although leaving enough to provide a grasp for the wasp.

#### *Liris dominicana*, new species

FIGURES 3, 6, 9, 11, 19

HOLOTYPE.—♂, Clarke Hall, Layou Valley, Dominica, 20–28 February 1965 (H. E. Evans), USNM 71367.

Length 7.0 mm; forewing 6.0 mm. Black; forewings subhyaline, slightly infuscated along outer



margin; hind wings hyaline, slightly darkened apically. Body clothed with pubescence which tends to be somewhat more coarse and suberect than in the preceding species, especially on the propodeum; front and clypeus densely silvery-pubescent; abdomen with apical silvery bands on tergites I–IV, also silvery apically and ventrally.

Mandibles with the upper margin edentate, although slightly sinuate (Figure 11). Clypeus with a moderately broad, truncate median lobe; first four antennal segments in a ratio of 29:7:14:14, segment three  $2.3\times$  as long as its apical width; head  $1.28\times$  as wide as high; interocular distance at anterior mandibular condyles  $2.9\times$  the least interocular distance on the vertex, the latter distance  $1.25\times$  as great as the length of the third antennal segment. Sculpturing of thoracic dorsum as described for *L. gryllicida*, but propodeum notably more elongate than in that species and the posterior declivity less strongly marked off from the disc, there being only some weak, irregular carinae at the junction; median carina of propodeum very short, but followed by a shallow groove that extends over half the length of the disc. Hind tibia weakly ridged above; claws simple. Basal abdominal segment unusually slender, subpetiolate (Figure 6); venter without modification other than some rather coarse pubescence on segments III–V; subgenital plate slightly broader and more distinctly emarginate apically than in *L. gryllicida*, the genitalia very different from those of that species by virtue of the elongate parameres and the densely setose volsellae (Figure 3).

ALLOTYPE.—♀, Clarke Hall, Layou Valley, Dominica, 10–17 February 1965 (Evans), USNM.

Length 9.0 mm; forewing 7.0 mm. Black; wings subhyaline, slightly more heavily infuscated along outer margin, without yellowish tints. Pubescence of head and thorax silvery, especially dense on front and clypeus, on the pleura and propodeum somewhat more coarse and suberect than in *L. gryllicida*; abdomen with rather indistinct silvery bands on the apices of the first four tergites.

Mandibles as described and figured for preceding species. Clypeus with a broad median lobe which is subdentate laterally and weakly indented at the midline (Figure 19); first four antennal segments in a ratio of 34:9:18:20, segment three  $2.8\times$  as long as its apical width; head  $1.3\times$  as wide as high; interocular distance at anterior mandibular condyles

$3.4\times$  the least interocular distance on vertex, the latter distance subequal to length of third antennal segment. Features of thorax as in male except median propodeal carina extending for slightly more than half the length of the dorsal surface; front basitarsus with four short pecten spines plus several additional spines; hind tibia with a complete, sharp ridge above; claws simple except toothed at extreme base. Basal abdominal tergite gradually expanded from front to rear, as in male; sternites I–IV rather dull, alutaceous; sternite V somewhat more shining, more strongly punctate; sternite VI shining and strongly punctate; pygidium densely clothed with subappressed, golden spines.

PARATYPES.—4 ♀♀, 9 ♂♂, Clarke Hall, Layou Valley, February–May (Evans, Steyskal, Jackson, Gagne); 1 ♂, Grand Bay, 8 February 1965 (Evans).

VARIATION.—The females vary in size from 8 to 9 mm, forewing from 6 to 7 mm. The males vary in size from 5 to 7 mm, forewing from 4.5 to 6.0 mm. The major variation to be noted is in the median propodeal carina, which may be very short or may be continued behind as a groove or weak carina nearly to the crest of the declivity.

REMARKS.—I have seen no specimens of this species from others of the Lesser Antilles.

### *Liris sophiae*, new species

FIGURES 4, 10, 15

HOLOTYPE.—♂, Fond Sophie, Dominica, 2 October 1964 (T. J. Spilman), USNM 71368.

Length 8.0 mm; forewing 6.0 mm. Black; wings lightly infuscated, distinctly darker along outer margin. Body clothed with fine, appressed pubescence, conspicuously silvery on clypeus, front, and much of thorax, though darker on vertex and mesoscutum; abdomen with strongly developed silvery bands at the apices of tergites I–IV, also somewhat silvery apically.

Mandibles with a small tooth well back along the inner margin (Figure 10). Clypeus with a moderately broad median lobe which is subcarinate medially, weakly arcuate apically; first four antennal segments in a ratio of about 27:8:13:14, segment three  $1.8\times$  as long as wide, penultimate segment twice as long as wide; head  $1.30\times$  as wide as high; interocular distance at anterior mandible condyles  $2.3\times$

the least interocular distance on the vertex, the latter distance  $1.6\times$  the length of the third antennal segment. Mesoscutum and scutellum weakly shining, micropunctate, metanotum even more finely punctate; propodeum dull, microreticulate, median carina absent except at extreme base, dorsal surface separated from declivity by a strong, nearly complete carina. Hind tibia sharply ridged above, the ridge bearing two spines, these and the other spines on the tibia whitish in color; claws simple. Basal abdominal segment abruptly expanded on basal half, tergite I nearly flat on posterior half; venter smooth, with only a few scattered setae, sternites III–VI rather flat, weakly depressed; apical sternite weakly emarginate medially; genitalia similar to those of *gryllicida*, but with a fan-shaped brush of long setae on the volsellae (Figure 4).

ALLOTYPE.—♀, same data as type, USNM.

Length 8.3 mm; forewing 6.0 mm. Black; color of wings and pubescence as in male; apical silvery bands on abdominal tergites I–IV especially conspicuous. Mandibles essentially as described and figured for *L. gryllicida*. Clypeus with a broad median lobe which is somewhat rounded apically, but with a weak median notch (Figure 15); first four antennal segments in a ratio of 31:9:17:17, segment three  $2.8\times$  as long as wide; head  $1.25\times$  as wide as high; interocular distance at anterior mandibular condyles  $3.0\times$  the least interocular distance on vertex, the latter distance  $1.1\times$  the length of the third antennal segment. Features of thorax as described for male. Front basitarsus with four pecten spines plus several additional spines; hind tibia somewhat weakly ridged above, its spines dark; claws simple aside from the usual basal swelling. Basal abdominal segment strongly expanded basally, tergite nearly flat on posterior half; pygidial plate more slender and tapering than in the preceding two species, clothed with fine, pale setae; sternites I–III dull, IV–VI shining.

PARATYPES.—2 ♀♀, 1 ♂, same data as type except male taken by Spangler; 1 ♀, Portsmouth, 23 February (Evans); 2 ♀♀, 1 ♂, Clarke Hall, February, October (Spangler, Evans, Gurney); 1 ♀, Pt. Mulatre Est., 14–15 September (Anderson; sweeping grass); 2 ♂♂, Anse Bouleau, 10 October (Spangler); 1 ♂, Roseau, 21 February 1937 (S. T. Danforth).

VARIATION.—The females vary in size from 7.0 to 9.5 mm, forewing from 5.5 to 7.0 mm; the males

vary in size from 7.0 to 8.0 mm, forewing from 5.5 to 6.5 mm. In several of the females, sternite IV is dull like the preceding sternites. There is considerable variation also in the development of the ridge on the hind tibia. In two of the females there is a long but very delicate median carina on the propodeum.

REMARKS.—I am not aware that this species occurs on other of the Antilles.

### *Liris radulina*, new species

FIGURES 5, 7, 14, 16

HOLOTYPE.—♂, Grand Bay, Dominica, 8 February 1965 (W. W. Wirth), USNM 71369.

Length 6.5 mm; forewing 5.3 mm. Black; wings subhyaline, darker along outer margin. Body virtually without erect setae, but covered with a fine, appressed pubescence, generally silvery but darker on vertex and mesoscutum; silvery pubescence especially conspicuous on clypeus, front, temples, coxae, pleura and propodeum; abdominal tergites I–IV with apical silvery bands.

Mandibles with a weak tooth and notch well back along inner margin (Figure 14). Median lobe of clypeus narrower than in other Dominica species, slightly subangularly produced medially (Figure 16); first four antennal segments in a ratio of 23:7:11:11, segment three  $1.6\times$  as long as its greatest width, penultimate segment  $1.4\times$  as long as wide; head  $1.24\times$  as wide as high; interocular distance at anterior mandibular condyles  $2.4\times$  the least interocular distance on the vertex, the latter distance  $1.7\times$  the length of third antennal segment, subequal to second and third segments together. Entire thoracic dorsum rather dull, closely, minutely punctate; propodeum weakly depressed along the midline, with evidence of a weak median carina at extreme base; propodeal declivity separated from dorsal surface by a carina which is complete medially; propodeum weakly rugose laterally near junction of disc and declivity. Hind tibiae weakly ridged above; tibial spines rather pale; claws simple. Venation differing from that of other Dominica species in that the second submarginal cell is triangular, the first and second inter-cubital veins meeting the radius at almost the same point. Abdomen subsessile, first tergite flat on posterior half; sternites III–VI slightly depressed medi-

ally, rather smooth; last sternite truncate apically; genitalia of unusual form, aedeagus swollen apically and bearing a double series of spines which are directed basad, volsellae unusually long, setose, hyaline (Figure 5).

PARATYPES.—BARBADOS: 2 ♂♂, no further data (J. R. Bovell), BMNH. MUSTIQUE, GRENADINES: 1 ♂, no further data (H. H. Smith), BMNH.

VARIATION.—The three paratypes resemble the type closely in size and structural features, including the genitalia. However, the second submarginal cell is not fully triangular in any of them, although it is nearly so in all three.

REMARKS.—I have seen no females that I can assign with assurance to this species. It may well be widely distributed in the Windward Islands but barely reach Dominica on the south coast. The specific name *radulina* was selected with reference to the aedeagus (from *radula*, a file).

### *Tachytes chrysopyga* (Spinola)

*Lyrops chrysopyga* Spinola, 1841, p. 112 (Cayenne).  
*Tachytes argenipes* Smith, 1856, p. 306 (St. Vincent).—Ashmead, 1900, p. 227 (St. Vincent, Grenada).—Wolcott, 1923, p. 44 (Puerto Rico).  
*Tachytes insularis* Cresson, 1865, p. 140 (Cuba).

This species is evidently widely distributed in subtropical and tropical America north of the equator. Identification of this species as Spinola's *L. chrysopyga* is by A. S. Menke, who is preparing a catalog and reclassification of the Sphecidae (with R. M. Bohart). I have seen specimens from the following islands in the West Indies: Cuba, Hispaniola, Puerto Rico, St. Croix, St. John, Dominica, St. Vincent, and Grenada. On Dominica I have found it principally in cultivated land near the coast. Notes on its nesting behavior are presented below.

Following are the records from Dominica: 1 ♀, South Chiltern, 1600 feet, 19 February (Evans); 3 ♀♀, 1 ♂, mouth of Layou River, 6 February, 13 March (Evans); 69 ♀♀, 17 ♂♂, Clarke Hall, January–June, October–November (Wirth, Flint, Spangler, Steyskal, Gagne, Evans); 2 ♀♀, Melville Hall, February, March (Gagne, Evans); 1 ♀, Castle Bruce, March (Bray); 1 ♀, Cabrit Swamp, November (Spangler); 1 ♀, Colihaut, October (Spangler); 1 ♂, Grande Savane, February (Wirth); 1 ♂, Mero, January (Clarke).

BIOLOGY.—From 28 February to 11 March 1965, I made intermittent observations on a nesting aggregation of this wasp in a banana plantation, a few meters from the banks of the Layou River, near Clarke Hall. There were about 10 nests, all within 1.5 m<sup>2</sup> between rows of banana trees, in partial shade. Nest entrances were in some cases only 15 cm apart; three were in the open, the remainder under leaves or dried grass, where they were difficult to locate unless the female was seen entering. Each nest entrance was surrounded by a rim of soil 5–7 cm across and about 1 cm high, the hole penetrating the center and fully 1 cm across at the entrance. The soil here was a soft, friable loam, somewhat sandier than in adjacent areas.

Females arrived in the nesting area carrying immature katydids on the wing, holding them by the antennae with their mandibles and also embracing them in flight with all three pairs of legs. Usually they plunged directly into the nest entrances, which were always left open, but occasionally prey-laden wasps would land on banana leaves before proceeding to the nest. On two occasions I had accidentally stepped on a nest, and returning females circled the area for several minutes before abandoning their prey; they evidently lacked the capacity to dig into the nest while keeping their prey.

Despite the large amount of active provisioning, I had little success in locating the cells, as the soil was filled with roots. I followed one burrow down 22 cm and another, 27 cm without locating any cells. In a third nest I found a cell containing a small larva at a depth of 18 cm. In each case the burrow passed straight down except for small curves around roots. The several prey taken from this cell, as well as several more taken from provisioning females, were all immature Tettigoniidae of the genera *Turpilia* and *Neoconocephalus* (det. A. B. Gurney). None of them appeared to have had the antennae amputated, as I found to be the case with *Liris gryllicida*.

### *Pison (Entomopison) sp.* near *convexifrons* Taschenberg

The genus *Pison* has been collected only twice on Dominica, and the two specimens cannot be placed readily in any known species. Both came from near houses not far from the coast, and the species may possibly be an introduction. It seems unwise to de-

scribe this species until the neotropical *Pison* have been revised. The records are as follows: 1 ♀, South Chiltern, 1600 feet, 19 February (Evans); 1 ♀, Clarke Hall, 30 May (Steyskal).

*Trypoxylon (Trypargilum) sp.*  
near *nitidum* Smith

The single specimen of this subgenus taken on Dominica seems very close indeed to the widely distributed and variable neotropical species *I. nitidum*, which has been taken on Trinidad. It is not closely related to members of the *excavatum* subgroup (Richards, 1934), consisting of several Greater Antillean species. This is a large and difficult subgenus in the tropics, and there seems little point in describing this single specimen, which may, in fact, fall within the range of variation of *nitidum*. It is from Fond Colet, Dominica, 5–9 October (Spangler).

*Trypoxylon (Trypoxylon) layouanum*, new species

FIGURE 20

HOLOTYPE.—♂, Clarke Hall, Layou Valley, Dominica, 20–28 February 1965 (H. E. Evans), USNM 71370.

Length 5 mm; forewing 3.8 mm. Black, extensively marked with lighter colors, as follows: palpi straw-colored, mandibles testaceous, the tips rufous; clypeus mostly testaceous; first antennal segment testaceous and second largely so; pronotum testaceous except the posterior lobes white; tegulae testaceous, translucent; scutellum dull ferruginous; mesopleura and sternum testaceous; front and middle coxae whitish, legs otherwise testaceous to straw-colored except hind femora and middle and hind tibiae and tarsi suffused with brown; junction of propodeum and abdomen whitish, the abdomen ringed with testaceous at the base of segment I and at the junctions of tergites I–II, II–III, III–IV, and to a lesser extent IV–V; venter mostly pale. Wings hyaline. Body clothed with a fine, silvery pubescence, most noticeable on the clypeus, front, pleura, and propodeum.

Clypeus with a small, blunt median lobe, its margin smooth, shining; least interocular distance, at the clypeus, 0.5× the upper interocular distance, at the vertex; front weakly elevated by not really keeled above

antennal insertions; upper front and vertex weakly shining, alutaceous; lateral ocelli removed from eye margin by two-thirds their own diameter. Antennae short, clavate, the segments in approximately the following ratio: 12:8:9:7:7:7:7:7:7:7:26, apical segment 2.3× as long as wide, segments 10–12 somewhat wider than long; segments 4–11 with small tyloides beneath, that on 11 strongly projecting (Figure 20). Pronotum short, smoothly rounded; mesoscutum weakly shining, alutaceous and micropunctate; propodeum reticulate basally, the declivity with a deep median groove; mesopleura simple, somewhat shining; lateral lobes of postnotum somewhat irregularly elevated, thickened, mainly testaceous, but brown both anteriorly and posteriorly. Abdomen slender, slightly constricted between each of the basal three segments.

PARATYPES.—2 ♂♂, same data as type, except one collected 10–17 February 1965.

REMARKS.—The two paratypes are closely similar to the type in size, color, and all structural details. All three specimens were taken while sweeping the lower branches of trees along the Layou River. This species is a member of the *fabricator* group of Richards (1934), apparently most closely related to *I. succinctum* Cresson (Cuba) and *I. grenadense* Richards (Grenada). It is smaller and differently colored than both of those species, and different in antennal characters as well as in the form of the lateral postnotal lobes.

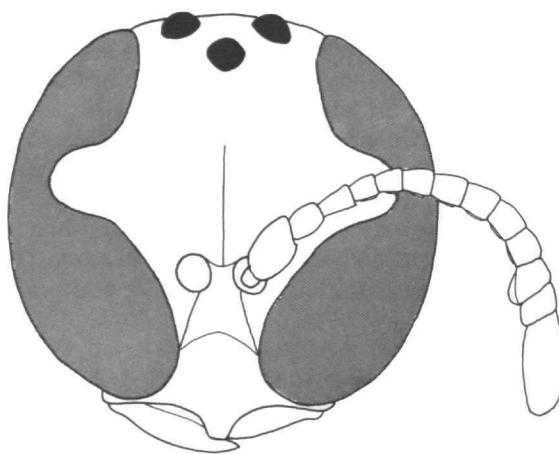


FIGURE 20.—Head, *Trypoxylon layouanum*, new species, holotype ♂.

*Euplilis (Euplilis) claviventris* (Cresson)

*Crabro claviventris* Cresson, 1965, p. 151 (♂, Cuba).

*Euplilis (Euplilis) claviventris*.—Pate, 1947, p. 5 (♀ described).

*Euplilis claviventris*.—Alayo, 1968, p. 4.

Ashmead (1900) recorded this species from Grenada, but Pate found that Ashmead's specimens belonged to a different species, which he described as *E. grenadinus*. A single male collected on Dominica is very different from *grenadinus* but agrees reasonably well with Cresson's description of the male *claviventris* (though less well with Pate's somewhat inaccurate paraphrasing of the description). The type is in Havana, and I have not studied it; Alayo (1968) had seen no specimens other than the type. Pate recorded *claviventris* only from Cuba, with one doubtful record from Jamaica. Evidently the genus is more widely distributed in the West Indies than appreciated, and final appraisal of the one Dominica specimen must await further collecting and study of West Indian material. The single male is labelled, "Trail, 1 mile north of junction of roads to Rosalie and Castle Bruce, 1300 feet, 23 April (Gagne)."

*Ectemnius (Hypocrabro) dominicanus*, new species

HOLOTYPE.—♀, near Syndicate Estate, 5 March 1964 (D. F. Bray), USNM 71371.

Length 10 mm; forewing 7 mm. Black, marked with white as follows: scape except for black streak above; posterior lobes of pronotum and an interrupted stripe along posterior dorsal margin of pronotum; small spots anterolaterally on scutellum (each side of transverse furrow); transverse stripe on metanotum; spot on posterior surface of front femur and a larger one on the middle femur; spot on side of hind tibia; widely separated spots on abdominal tergites I–V, spots on I less widely spaced than those on II–IV, those on V drawn out into a band that is narrowly interrupted on the mid-dorsal line. Wings uniformly infuscated. Clypeus, front, temples, thoracic pleura, and propodeum with considerable pale pubescence; top of head and thorax with an abundance of dark, erect hairs.

Mandibles tridentate; median lobe of clypeus broadly subangulate, the midline elevated but not sharply carinate; front with a median polished streak, above which (anterior to the ocelli) it is dull, with

small, contiguous punctures; vertex more shining and with the punctures more widely spaced; ocello-ocular distance exceeding postocellar distance as 4:3; least interocular distance subequal to postocellar distance; scape with a delicate carina along its entire lateral surface; mesoscutum rather dull, reticulate-punctate; scutellum strongly swollen, the swelling depressed medially, surface with strong, separate punctures; propodeum with fine, mostly reticulate sculpturing, with a median groove; mesopleura horizontally striatorugose. Front femora longitudinally ridged on the posterior margin toward the base; middle and hind tibiae strongly spinose. Abdomen polished, weakly punctate, but first tergite with larger punctures than the following tergites; first and second tergites separated by a shallow constriction; pygidial plate attenuate apically, the tip narrowly rounded, surface with several coarse, setigerous punctures.

ALLOTYPE.—♂, same data as type but with an additional label: "emerged III–10–1964 ex log provisioned with flies," USNM.

Length 6.5 mm; forewing 5 mm. Coloration as in female except that abdominal tergite VI has a narrow, complete band of the same color as the markings on the preceding tergites (white, with a faint tinge of yellow). Wings uniformly lightly infuscated. Clypeus and sides of lower front with dense, silvery pubescence; pleura with pale, fine setae, but dorsum of head and thorax with rather dense, dark, erect setae.

Mandibles bifid apically; median lobe of clypeus rounded, the margin raised, the midline carinate; sculpture of front and vertex as in female, but temples shorter and more receding than in that sex; postocellar and ocello-ocular distances equal; least interocular distance (just above antennal insertions) slightly less than postocellar distance; antennal segments 7–11 wider than long. Pronotum as in female; mesoscutum and scutellum with coarse, contiguous punctures, such that the surface appears reticulate, the scutellum swollen as in female; propodeum with coarse, irregular, reticulate sculpturing; mesopleura coarsely striatorugose, the uppermost striae horizontal, the lower ones oblique to nearly vertical. Tibiae less strongly spinose than in female, but legs otherwise similar. Abdomen shining, tergite I with some fairly coarse punctures, II and III progressively more finely punctate, IV–VII very finely punctate. Venter with dense, pale setae on sternites III–VII, a

number of longer setae rising from among the shorter ones, especially along the margin of the apical sternite.

PARATYPES.—3 ♂♂, same data as allotype except one labelled “emerged ex log III-16-1964.”

REMARKS.—The three paratypes are similar to the allotype in all essentials. In two of them the pale band on tergite VII is widely interrupted medially. Two of the paratypes have several mites on abdominal tergite I and a few on other parts of the body; the third paratype has one mite on tergite I, while the allotype has two mites on the head. There are none on the female holotype.

### *Stictia signata* (Linnaeus)

*Vespa signata* Linnaeus, 1758, p. 574.

*Monedula insularis* Dahlbom, 1844, p. 186.

*Monedula signata*.—Handlirsch, 1890, p. 86.

*Stictia signata*.—Parker, 1929, p. 26.—Evans, 1966b, p. 243 (nesting behavior).—Evans and Matthews, 1968, p. 1294 (synonymy of *insularis* indicated).

This large, strong-flying wasp ranges from extreme southern United States to Peru and Brazil. It occurs very widely in the West Indies and may inhabit all islands, even very small ones. On Dominica it occurs principally on or near the coast, in sand along sea beaches or rivers. Here it builds shallow nests in the soil and provisions them with flies, chiefly Calliphoridae and Syrphidae (see Evans, 1966b, for data from Dominica and other localities).

Dominica records are as follows: 4 ♀♀, 2 ♂♂, Grande Savane, February, September (Evans, Spilman); 2 ♀♀, 1 ♂, mouth of Layou River, February, November (Gurney, Bray, Evans); 6 ♀♀, Clarke Hall, Layou Valley, February–April, July (Wirth, Clarke, Davis, Flint, Jackson, Evans); 4 ♀♀, Scott's Head, August, October (Spangler, Jackson); 2 ♀♀, 4 ♂♂, Mero, February, March, July (Bray, Flint, Gagne); 2 ♀♀, Roseau River, 1 mile above Roseau, 23 July (Flint); 1 ♂, Fond Sophie, 2 October (Spilman); 4 ♀♀, 13 ♂♂, Cabrit Swamp, April, November (Spangler, Flint).

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