

Fig. 10. *Syrphus vockerothi*. a, Wing. b, Head of male, lateral. c, Abdomen pattern.

Syrphus vockerothi Thompson, NEW SPECIES

Fig. 10

Syrphus ribesii of Johnson, 1919: 434 (Jamaica); Gowdey, 1926: 79 (Jamaica).

Male, Female.—*Head*: Face yellow, shiny except sparsely yellow pollinose laterally, yellow pilose except black pilose laterad of antennae; cheek yellow, yellow pilose; frontal lunule mainly yellow, with small brown spots above antennae; frontal triangle black, brownish yellow pollinose, black pilose; front black, densely yellow pollinose, black pilose; vertex black, brownish pollinose, black pilose; occiput yellow on lower $\frac{1}{5}$, black elsewhere, yellow pollinose and pilose, with black cilia on upper $\frac{1}{4}$; eye bare. Antenna orange, black pilose; 3rd segment large, pointed apically, about $1\frac{1}{2}\times$ as long as 1st 2 segments and as broad; arista orange.

Thorax: Completely olivaceous bronze, slightly more bluish in tone on pleuron and more yellowish in tone on sides of mesonotum, yellow to orange-yellow pilose except black pilose on scutellum; scutellum dull yellowish orange on disc, yellow laterally, black pilose; squama, plumula and halter yellowish orange. *Legs*: Coxae black, silvery pollinose, yellow pilose;

trochanters black, except partially orange hindtrochanter, yellow pilose; apical 4 hindtarsomeres brownish black and black pilose; rest of legs yellow orange, yellow pilose except black pilose on apical half of hindbasitarsus. *Wing*: Hyaline, extensively bare on basal $\frac{1}{2}$; basal $\frac{1}{5}$ of 2nd costal cell, above Rs, 1st basal cell, basal $\frac{1}{5}$ of apical cell, below spurious vein, 2nd basal cell except for a few scattered apical hairs, and anterobasal $\frac{1}{2}$ of anal cell bare.

Abdomen: Venter yellow, yellow pilose; dorsum mainly black with typical *ribesii* type of yellow pattern; spots on 2nd tergum extend over sides in more than $\frac{1}{2}$ their widths, fasciae on 3rd and 4th terga extend over sides in almost their full widths; 4th and 5th terga with narrow apical yellow fasciae; 5th tergum with basolateral corners yellow, 1st and basal $\frac{2}{3}$ of 2nd tergum yellow pilose, rest of dorsum black pilose except for a few yellow hairs intermixed on yellow fascia of 3rd tergum.

Holotype.—♂, JAMAICA, Portland, Hardwar Gap, 25 March 1962, T. H. Farr; deposited in USNM. *Paratypes*: JAMAICA: St. Thomas Parish, Portland Gap, 11 June 1954, T. H. Farr, 1 ♂ (IJ); Portland, Hardwar Gap, 23 September 1965, T. H. Farr, 1 ♀ (USNM); Blue Mountain Peak, 7400 ft., 21–28 July 1966, Howden and Becker, 1 ♀ (CNC); Cinchona, 5000 ft., January 1912, C. T. Brues, 1 ♀ (CNC). HAITI: La Visite and vic., La Selle Range, 5–7000 ft., 19–23 September 1934, M. Bates, 1 ♂ (CNC). DOMINICAN REPUBLIC: SE Constanza, Valle Nuevo, 7000 ft., August 1938, P. J. Darlington, 1 ♀ (MCZ).

Discussion.—*Syrphus vockerothi* belongs to the *phaeostigma* superspecies. This superspecies consists of four vicariant species: *shorae* Fluke (Mexico to Ecuador), *reedi* Shannon (Peru to Chile and Argentina), *phaeostigma* Wiedemann (Brazil to Argentina), and *vockerothi* (West Indian). These species are distinguished from all other New World species by the following characters: Bare eye; large pointed 3rd antennal segment; mostly orange hindbasitarsus; extensively microtrichose costal cells; and typical *ribesii* abdominal patterns. *Syrphus vockerothi* differs from all other species of the complex by its completely orange antenna and almost completely bare basal cells.

In Fluke's key to the Neotropical *Syrphus* species (1942: 2) *vockerothi* will run to *reedi* Shannon (as *similis* Blanchard in the key) but is readily separated from *reedi* by its orange antennae and bare basal cells. In Fluke's key to the Nearctic species of *Syrphus* (1954: 1–3) *vockerothi* will run to *bigelowi* Curran but is easily distinguished from that species by its large pointed 3rd antennal segment, extensively bare wing, orange pilose hindfemora, etc.

It gives me great pleasure to name this species after my colleague, J. R. Vockeroth, in recognition of his work on *Syrphus* (*sensu lato*) and other Syrphidae.

Genus *Allograpta* Osten Sacken

Allograpta Osten Sacken, 1875: 49. Type-species, *Scaeva obliqua* Say (mono.).

Oligorhina Hull, 1937: 30 (preocc. by Fairmaire and Germain, 1863). Type-species, *aenea* Hull (orig. des.).

Rhinoprosopa Hull, 1942b: 24 (new name for *Oligorhina* Hull).

Antillus Vockeroth, 1969: 130. Type-species, *ascitus* Vockeroth (orig. des.).

References: Curran, 1928b: 36 (key to Puerto Rican spp.); Vockeroth, 1969: 126–130 (descript.); Vockeroth, 1973 (synonymy); Telford, 1973: 220 (key to Puerto Rican spp.).

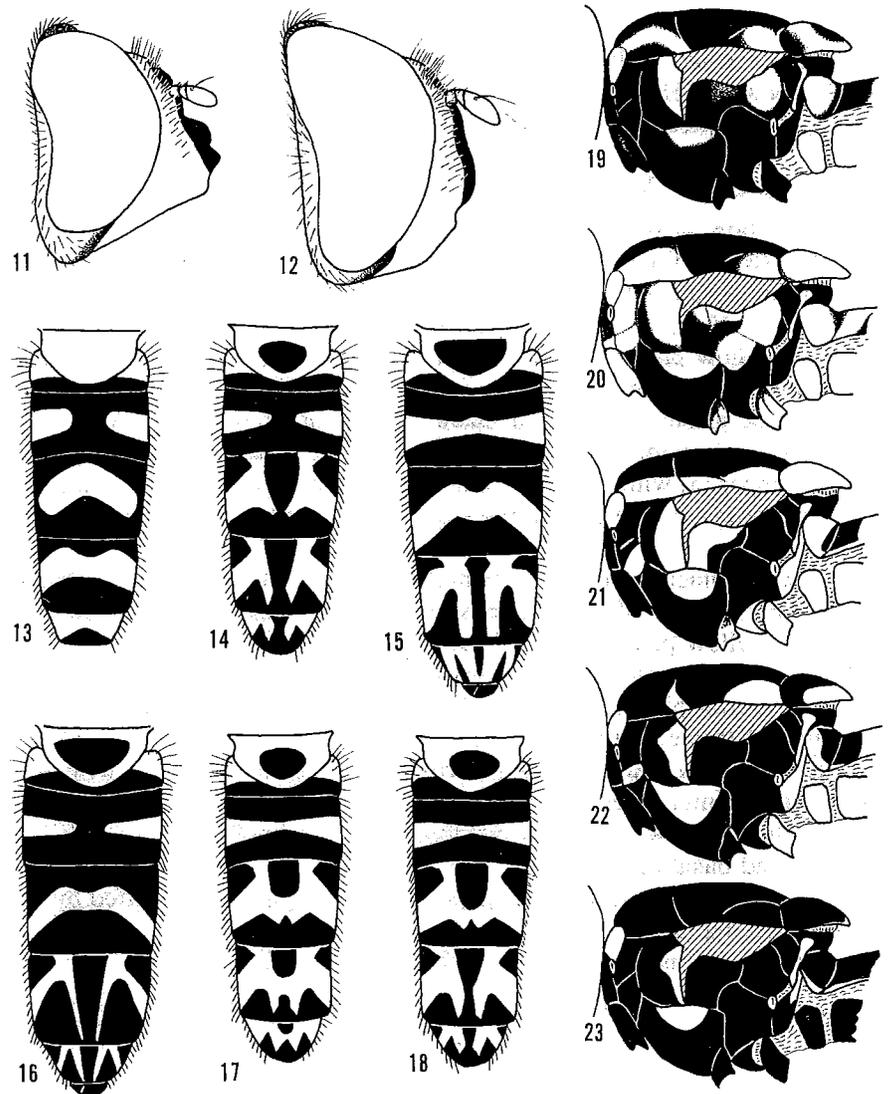
The genus *Allograpta*, as now interpreted (Vockeroth, 1969, 1973), is a large and diverse group of almost worldwide distribution. The genus reaches its greatest diversity in the Neotropics where it is represented by more than 70 species. In the New World *Allograpta* ranges from southern Canada (six Nearctic species) south to Magallanes in Chile (*hortensis* Philippi) and is found on most of the regional islands including the Galápagos (*splendens* Thomson) and the Juan Fernández Islands (*exotica* Wiedemann and *robinsoniana* Enderlein). In the Old World, *Allograpta* is found throughout the Ethiopian Region (ten species) and Oriental Region (eight species) and extends northward to Japan (*javana* Wiedemann), eastward across the South Pacific to Tahiti (*nigripilosa* Hull; six Oceanic species), and southward to Australia (*australensis* Schiner) and New Zealand (nine species). Three distinct species groups of *Allograpta* are found in the West Indies, *aenea* Hull group (= *Rhinoprosopa* Hull, one species on Hispaniola), *ascitus* Vockeroth group (= *Antillus* Vockeroth, one species on Hispaniola), and *obliqua* Say group (= *Allograpta*, *sensu stricto*; eight species, all islands).

There is no comprehensive key to the Neotropical species of *Allograpta* in its presently understood sense. Fluke (1942) provided excellent keys to the New World *Allograpta* species, but these species were placed in three different genera (*Claraplumula*, *Epistrophe* (couplets 2–18), and *Allograpta*). Hull (1949a: 101, couplets 3–5) provided a key to the species of the “*Rhinoprosopa*” group.

KEY TO WEST INDIAN SPECIES OF *ALLOGRAPTA* OSTEN SACKEN

1. Face straight, not produced forward (Fig. 12); oral margin distinctly less prominent than antennal base; oral opening only 2× as long as broad 5
 - Face produced forward (Fig. 11); oral margin considerably more prominent than antennal base; oral opening 3× or more longer than broad 2
2. Mestasternum bare 3
 - Metasternum pilose 4

3. Wing completely microtrichose, all brownish; alula narrow, narrower than 2nd basal cell; antennae broadly separated, separated by about length of 3rd segment; pteropleuron yellow (Hispaniola) *aenea* (Hull)
- Wing extensively bare basally, hyaline except for black stigma and apical wing spot (Fig. 24); alula broad, broader than 2nd basal cell; antennae narrowly separated, separated by much less than length of 3rd segment; pteropleuron aeneous (Hispaniola) *ascita* (Vockeroth)
4. Front femur reddish yellow; 3rd abdominal tergum with a complete yellow fascia (Fig. 13) (Cuba) *flukei* Curran
- Front femur black on basal $\frac{1}{2}$; 3rd tergum with a pair of yellow pear-shaped spots (Jamaica) *funeralis* (Hull)
5. Thorax with a yellow spot above front coxa and yellow on barrette (Fig. 20); scutellum yellow (Jamaica, Hispaniola) *obliqua* (Say)
- Thorax with black barrette and without yellow supraprocoxal spot (Fig. 19); scutellum yellow, usually with black medial spot 6
6. Squama brown except narrowly yellowish on base; pteropleuron normal not produced dorsoposteriorly; frontal triangle of male black pilose 7
- Squama mostly yellowish to white, upper margin may be slightly infusate; pteropleuron with dorsal edge produced posteriorly and fringed, forming a 2nd “plumula”; frontal triangle of male almost completely yellow pilose; (abdominal pattern Figs. 14, 17–18) (Florida, Cuba, Bahamas, Jamaica, Puerto Rico, Virgin Islands) *radiata* (Bigot)
7. Mesonotum shiny; hindtrochanter and base of femur yellow; 2nd abdominal tergum with complete yellow fascia (Fig. 15) (Puerto Rico, Lesser Antilles) *limbata* (Fabricius)
- Mesonotum dull brownish pollinose; hindtrochanter and basal $\frac{1}{8}$ of hindfemur black; 2nd tergum with a broadly interrupted yellow fascia (Fig. 16) 8
8. Fourth tergum with a pair of inverted V-shaped yellow marks (Fig. 16); other characters variable (v.i.) 9
- Fourth tergum with a yellow fascia, similar to that of 3rd tergum; sternopleuron all black; wings more extensively microtrichose, apical $\frac{1}{4}$ or more of costal and 1st and 2nd basal cells microtrichose (Jamaica) species A
9. Sternopleuron yellow on upper $\frac{1}{3}$ (Fig. 19); wing extensively bare on basal $\frac{1}{2}$; costal and basal cells completely bare (Puerto Rico) *insularis*, new species
- Sternopleuron all black; wing more extensively microtrichose; apical $\frac{1}{4}$ or more of costal and both basal cells microtrichose (Jamaica) *neotropica* Curran



Figs. 11-12. *Allograpta* spp., heads, lateral. 11, *A. flukei*. 12, *A. limbata*. Figs. 13-18. Abdomens of *Allograpta*, dorsal. 13, *A. flukei*. 14, *A. radiata*, "venusta" form. 15, *A. limbata*. 16, *A. insularis*. 17, *A. radiata*, typical form. 18, *A. radiata*, intermediate form. Figs. 19-23. Thoraces, lateral. 19, *A. insularis*. 20, *A. obliqua* (Say). 21, *Toxomerus watsoni*. 22, *T. verticalis*. 23, *T. dispar*.

Allograpta aenea (Hull)

Oligorhina aenea Hull, 1937: 31. Type-loc.: Haiti, Mt. La Hotte, Desbarrière, 4000 ft. Holotype ♀ MCZ.⁵

Rhinoprosia aenea: Hull, 1942b: 24, 1943d: 64 (key ref.), 1949a: 101 (key ref.), 222, figs. 142, 147 (abdomen), 1949b: 288, fig. 9D (head).

Allograpta aenea: Vockeroth, 1973: 1103 (distr. rec. (Haiti)).

Distribution.—Hispaniola*.⁵

I have studied the female paratype of this species. Because Hull's original description is rather brief, I am providing a more detailed one.

Female.—*Head*: Face shiny yellowish orange, with black medial vitta, sparsely yellow pilose; cheek yellow, yellow pilose; frontal lunule triangular, shiny black; front dull orange, with broadly interrupted medial black vitta, black pilose; vertex dull black, black pilose; occiput silvery white pollinose, with slight brownish tinge on upper $\frac{1}{5}$, yellow pilose except black cilia on upper $\frac{1}{4}$, with 2 rows of hairs at midpoint, 3 rows below and 2 rows above; antenna orange except black dorsoapical edge of 3rd segment; arista black.

Thorax: Humerus yellow; mesonotum mainly black, brassy pollinose, with sides in front of transverse suture and postalar callus yellow, with scattered yellow pile and a few black hairs intermixed; pleuron all yellow, yellow pilose; scutellum yellow, with brownish tinge on disc, black pilose without ventral pile fringe; halter brown; squama dirty white with brown margin and fringe, with distinct fringe only on lower $\frac{1}{2}$. *Legs*: Yellowish orange, hindtibia and tarsus with brownish tinge, black pilose with some yellow hairs intermixed on femur. *Wing*: Brownish, completely microtrichose; alula narrow, slightly wider than 2nd costal cell, but less than $\frac{1}{2}$ as wide as 2nd basal cell.

Abdomen: Black pilose, with spots all isolated, pattern as figured by Hull (1949a: 223, fig. 142).

Material examined.—Paratype ♀ from Haiti (CNC).

Allograpta ascita (Vockeroth)

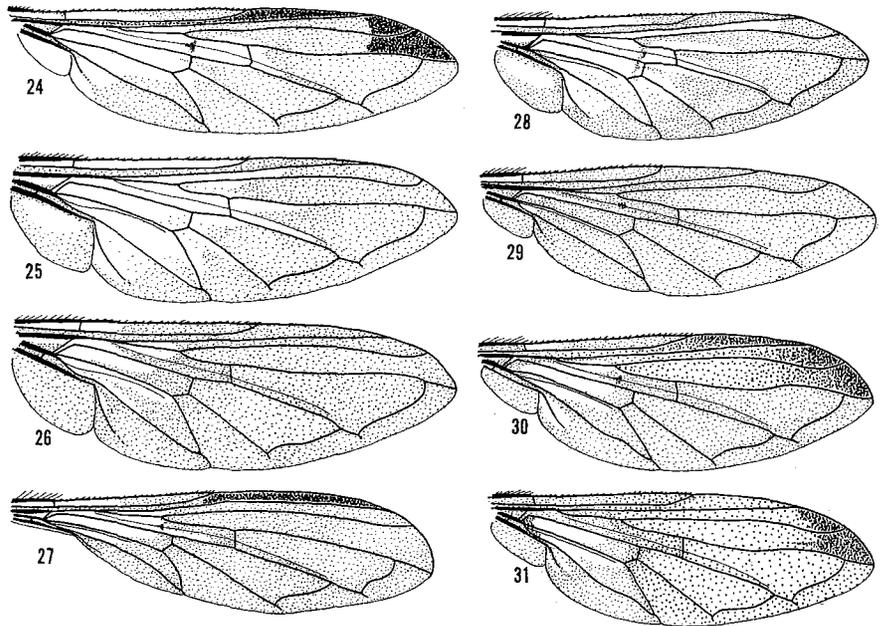
Fig. 24

Antillus ascitus Vockeroth, 1969: 131, fig. 18 (abdomen). Type-loc.: Haiti, Mt. La Hotte, Desbarrière, nr. 4000 ft. Holotype ♀ MCZ*.

Allograpta ascita: Vockeroth, 1973: 1103, fig. 2 (♂ genitalia) (descript. ♂, Dominican Republic).

Distribution.—Hispaniola*.

⁵ Abbreviations for type-depositories are given in acknowledgments. An asterisk (*) after the type-depository (or a locality) indicates that I have examined the type (or material from that locality).



Figs. 24–31. Wings. 24, *Allograpta ascita*. 25, *A. insularis*. 26, *A. flukei*. 27, *Ocyptamus sagittifer*. 28, *Allograpta obliqua*. 29, *Toxomerus musicus*. 30, *Ocyptamus superbus*. 31, *O. jactator*.

This distinctive species is known only from three specimens collected on Hispaniola.

Allograpta flukei Curran

Figs. 11, 13, 26

Allograpta flukei Curran, 1936b: 13. Type-loc.: Cuba, Oriente, Sierra del Cobre, Loma del Gato, 2600–3325 ft. Holotype ♂ AMNH*. Subsequent reference: Vockeroth, 1969: 130 (citation).

Epistrophe flukei: Fluke, 1942: 13 (key ref., citation).

Distribution.—Cuba*.

This species is known only from the holotype. Curran's original description is adequate except that there is no black pile on the mesonotum and the following characters should be added: Antennal pits widely separated; oral opening long, about $3\frac{1}{2}\times$ as long as wide; wing brownish and extensively microtrichose, only bare areas are 1st costal cell, basal $\frac{1}{4}$ of 2nd costal cell, narrowly on either side of Rs, basal $\frac{1}{8}$ of 1st basal cell, basal $\frac{1}{2}$ of 2nd basal cell, and narrowly on basal $\frac{1}{2}$ of anterior and posterior margins of anal cell; alula normal, much broader than width of anal cell; male genitalia of typical *Allograpta* type.

Allograpta funeralia (Hull)

Epistrophe funeralia Hull, 1944a: 27. Type-loc.: Jamaica, New Castle. Holotype ♀ MCZ.

Allograpta funeralia: Vockeroth, 1969: 130 (citation).

Distribution.—Jamaica*.

I have studied no material of this species, the placement in the above key is based on Hull's original description.

Allograpta insularis Thompson, NEW SPECIES

Figs. 16, 19, 25

Male.—*Head*: Face shiny, yellow with a broad medial black vitta, yellow pilose except for a few black hairs on vitta; cheek black; antennal pits separated by $\frac{1}{2}$ length of 1st antennal segment; frontal lunule black; frontal triangle yellow laterally, dull black medially, black pilose; vertex black, black pilose; occiput yellow on lower $\frac{1}{4}$, black elsewhere, white pollinose, white pilose. Antenna with 1st 2 segments dirty orange, black pilose; 3rd segment brown except orange on basoventral $\frac{1}{3}$; arista brownish.

Thorax: Black except yellow as follows: Humerus, notopleuron, narrow lateral stripe connecting humerus to notopleuron but isolated from lateral margin of mesonotum, postalar callus, posterior $\frac{1}{3}$ of mesopleuron, upper $\frac{1}{4}$ of sternopleuron, and metapleuron. Mesonotum dull brownish bronze pollinose on disc, narrowly shiny laterally in front of transverse suture, with pair of very faint submedial bronze vittae on anterior $\frac{1}{2}$, yellow pilose except black pilose on posterior $\frac{1}{4}$; postalar callus yellow pilose anteriorly and black pilose posteriorly; pleuron shiny, yellow pilose; plumula yellow; halter orange; squama brownish black except narrowly yellow on base; scutellum yellow with dull black medial spot and basolateral corners, black pilose, with black ventral pile fringe. *Wing*: Brownish, extensively bare on basal $\frac{1}{2}$, bare as follows: 1st and 2nd costal cells, basal $\frac{1}{2}$ of marginal cell, between 2nd and 3rd veins to level of anterior crossvein, basal $\frac{1}{3}$ of apical cell, basal $\frac{1}{8}$ of discal cell, basal $\frac{1}{4}$ of cubital cell, most of anal cell (which has only a few scattered hairs on apical $\frac{1}{4}$), basal $\frac{1}{3}$ of alula, and basal $\frac{1}{2}$ of anal lobe except along wing margin. *Legs*: Coxae and trochanters black, black pilose; front femur yellow except brownish subapical spot on posterior surface, mainly black pilose, with a few basal yellow hairs; middle femur yellow except for brownish black subapical annulus, black pilose except for a few basal yellow hairs; hindfemur black except for yellow broad ($\frac{1}{3}$ of femoral length) subbasal and narrow apical annuli, black pilose except for yellow hairs on subbasal yellow annulus; front and middle tibiae yellow, black pilose; hindtibia black except for yellow narrow medial annulus, black pilose; tarsi all black, black pilose.

Abdomen: 1st tergum yellow on basal $\frac{2}{3}$, black on apical $\frac{1}{3}$, yellow pilose;

2nd tergum mainly dull black, with pair of yellow medial fasciate spots which are separated by their width and are about as wide as $\frac{1}{4}$ of tergal length, narrowly shiny black on apical margin, yellow pilose on basal $\frac{2}{3}$, black pilose on apical $\frac{1}{3}$; 3rd tergum mainly dull black, with a yellow medial arcuate fascia, which is about as wide as $\frac{1}{4}$ of tergal length, black pilose, narrowly shiny black on apical margin; 4th tergum mainly dull black, with pair of yellow inverted V-shaped markings on each side, with outer arm stretching from base to apical $\frac{1}{8}$ of tergum and inner arms stretching to apical $\frac{1}{4}$, narrowly shiny black on apical margin, black pilose; 5th tergum mainly dull black with yellow markings similar to those of 4th tergum, narrowly shiny on apical margin, black pilose; sterna yellow, yellow pilose except for a few black hairs on apical 2 sterna; genitalia black, black pilose, of typical *obliqua* type.

Holotype.—♂, PUERTO RICO, Mt. Alegrillo, 27 July 1914, R. H. van Zwaluwenberg, collector; deposited in USNM.

Discussion.—*Allograpta insularis* is related to *neotropica* Curran and can be contrasted with that species as follows: 1) Sternopleuron yellow on upper $\frac{1}{3}$, not all black; 2) wing more extensively bare, with costal and basal cells bare, not microtrichose on apical $\frac{1}{4}$ or more; 3) scutellum with a black medial spot, not all yellow; 4) mesonotum extensively black pilose in front of scutellum, not all yellow pilose; and 5) squama with lower (thoracic) lobe brownish black, not yellow.

Allograpta limbata (Fabricius)

Figs. 12, 15

Scaeva limbata Fabricius, 1805: 251. Type-loc.: "Americae Insulis." Lectotype ♀ in MC*, see Appendix B. Subsequent reference: Zimsen, 1964: 481 (type).

Syrphus limbatus: Wiedemann, 1830: 133 (redescript.); Aldrich, 1905: 366 (citation).

Allograpta limbata: Wolcott, 1923: 219 (Puerto Rico, prey rec. [*Sipha flava* Forbes]), 1936: 350 (Puerto Rico); Enderlein, 1938: 217 (syn.: *similis* Curran, descript. notes, Brazil); Wolcott, 1941: 115 (Puerto Rico); Ramos, 1946: 57 (Puerto Rico); Wolcott, 1948: 464 (Puerto Rico, descript. notes, biol. notes, ? syn.: *fuscisquama* Curran); Miskimen and Bond, 1970: 66 (Virgin Is.); Telford, 1973: 221 (Puerto Rico, syn.: *fuscisquama* Curran).

Allograpta fimbata: Enderlein, 1938: 215 (misspelling).

Allograpta exotica of Wulp, 1883: 2, pl. 1, fig. (abdomen) (Guadeloupe); Williston, 1896: 348 (St. Vincent; diff. *fracta* Osten Sacken and *exotica* Wiedemann). Synonymy by Doesburg, 1970: 98.

Allograpta fuscisquama Curran, 1927: 4. Type-loc.: Puerto Rico, Ensenada. Holotype ♂ AMNH*. Subsequent references: Curran 1928b: 37 (Puerto Rico, Virgin Is.); Wolcott, 1936: 350 (Puerto Rico); Fluke, 1942: 15, 16,

24, fig. 35 (abdomen) (descript. notes); Beatty, 1944: 149 (St. Croix); Ramos, 1946: 57 (Puerto Rico); Wolcott, 1948: 464 (Puerto Rico; descript. notes); Vockeroth, 1969: 130 (citation); Doesburg, 1970: 92, 95, 98, 99 (Lesser Antilles; syn.: *exotica* of Wulp and Williston); Miskimen and Bond, 1970: 6 (Virgin Is.); Boyes et al., 1971: 66, pl. 17, fig. 7 (karyotype), pl. 19, fig. 6 (idiogram) (Puerto Rico). Synonymy by Telford, 1973: 221.

Distribution.—Puerto Rico*, Lesser Antilles (Guadeloupe*, Montserrat*, Dominica*).

As noted by Fluke, the black spot on the scutellum, the shiny mesonotum, and dark squamae readily identify this species. Curran's description of *fuscisquama* provides a good redescription of *limbata*. Of the material studied, the males from Dominica differ from those from Puerto Rico and the Virgin Islands by lacking a sternopleural yellow spot.

Allograpta neotropica Curran

Allograpta neotropica Curran, 1936b: 14. Type-loc.: Colombia, Popayan. Holotype ♂ AMNH*. Subsequent references: Fluke, 1942: 20, fig. 49 (abdomen) (Brazil, Ecuador), 1950a: 146, fig. 141 (♂ genitalia); Vockeroth, 1969: 130 (citation).

Allograpta obliqua var. *securifera* of Johnson, 1919: 434 (Jamaica).

Distribution.—Colombia, Ecuador, Brazil, Argentina; Jamaica*.

I have studied only two female specimens from Jamaica, these specimens agree well with the mainland ones, differing in the narrower facial vitta and the lower and less distinct facial tubercle.

Allograpta obliqua (Say)

Figs. 20, 28

Scaeva obliqua Say, 1823: 89. Type-loc.: United States. Types lost.

Syrphus obliqua: Wiedemann, 1830: 39 (descript.).

Allograpta obliqua: Osten Sacken, 1875: 49, 63; Johnson, 1919: 434 (Jamaica); Gowdey, 1926: 79 (Jamaica); Tucker, 1952: 349 (Barbados).

Syrphus dimensus Walker, 1852: 235. Type-loc.: United States. Type(s) ♂ BM(NH). Synonymy by Osten Sacken, 1878: 126.

?*Allograpta dimensa* of Cockerell, 1893: 259 (Jamaica).

Allograpta obliqua var. *securifera* of Fluke, 1942: 24 (Haiti).

Distribution.—Canada (Quebec) west to USA (Oregon), south to Brazil (Santa Catarina) and Argentina (Catamarca); Jamaica*, Hispaniola*, Barbados?.

The island specimens examined (14♂ ♀) differ from the typical mainland specimens of *obliqua* in the nature of the facial vitta and distribution of wing microtrichia. The facial vitta is broader and black in the island form, whereas in the typical *obliqua* it is usually absent in the females and light

yellowish brown in the males and some females. The second costal cell is microtrichose on about the apical third in the island form but is usually completely bare in typical *obliqua*. Also other wing cells are more extensively microtrichose in the island form than in mainland ones (Fig. 28). I do not consider these minor differences of sufficient magnitude to indicate or suggest potential reproductive isolation and to warrant species recognition.

Among the known junior synonyms of *obliqua* Say there does not appear to be any that are applicable to the island populations. The island form was referred to by Fluke as "undoubtedly a variation" of *obliqua* and perhaps the same form as described by Macquart (*securifera*). Macquart's *securifera* was described from "North America," not Savannah as stated by Fluke, and was considered to be the same species as *obliqua* by Osten Sacken (1878: 126), who examined Macquart's type. Macquart, in his original description, does not mention the color of facial vitta which would distinguish between the island and typical forms of *obliqua*. However, on the basis of the type-locality and Osten Sacken's synonymy, I accept *securifera* as a junior synonym of the mainland form of *obliqua*, not a synonym for an island form.

Allograpta radiata (Bigot)

Figs. 14, 17, 18

Syrphus radiatus Bigot, 1857: 338. Type-loc.: Cuba. Lectotype ♀ MNHN*, see Appendix B.

Allograpta cubana Curran, 1932: 3. Type-loc.: "E. E. A. de Cuba." Holotype ♂ AMNH*. Subsequent references: Fluke, 1942: 15, 17, 24, fig. 39 (abdomen) (key ref.; descript. note); Vockeroth, 1969: 130 (citation).

NEW SYNONYMY.

Allograpta venusta Curran, 1927: 5. Type-loc.: St. Croix, Blessing Estate, near Krause Lagoon in south central part of Island. Holotype ♂ AMNH*. Subsequent references: Curran, 1928b: 37 (Virgin Is.); Fluke, 1942: 15, 17, 24, fig. 38 (abdomen) (descript.; key ref.); Beatty, 1944: 149 (St. Croix); Vockeroth, 1969: 130 (citation); Miskimen and Bond, 1970: 66 (Virgin Is.); Doesburg, 1970: 98 (Virgin Is.); Boyes et al., 1971: 70, pl. 17, fig. 16 (karyotype), pl. 19, fig. 15 (idiogram) (chromosomes); Telford, 1973: 221 (Puerto Rico). NEW SYNONYMY.

Allograpta limbata of Wolcott, 1923: 219, 1936: 350, 1941: 115, 1948: 464; Ramos, 1946: 57 (in part).

Distribution.—USA (Florida*); Bahamas*, Cuba*, Jamaica*, Puerto Rico*; Lesser Antilles (Virgin Is.*).

Allograpta radiata is readily distinguished from all other *Allograpta* species by its modified pteropleuron. The dorsal edge of the pteropleuron is produced posteriorly into an elongate fringed structure very similar to the

plumula. Dr. Matile has examined the type of *radiata* for me and compared it with my notes and specimens. I have studied the types of *cubana* and *venusta*, and I believe these are all representatives of the same species.

The abdominal pattern of *radiata* is quite variable, so much so that Curran treated *radiata* as two species, *radiata* (as *cubana*) and *venusta*. The principal difference between these two forms is the shape of the basomedial black mark on the third through fifth terga: *radiata* is based on the form (Fig. 17) in which all the abdominal fasciae are complete and the basomedial black mark is a round to oval spot; *venusta* is based on the form (Fig. 14) in which all the abdominal fasciae are interrupted medially and the basomedial black mark is triangular. The *radiata* form is the common one in the North (Florida Keys, Cuba, and Bahamas); the *venusta* form appears to be very rare everywhere; an intermediate form (Fig. 18) is the common form in the South (Jamaica, Puerto Rico, and Virgin Is.); both the *radiata* and *venusta* forms have been collected together in Cuba and the Florida Keys; but the *radiata* form has not been found in Puerto Rico or the Virgin Islands.

According to Telford (1973: 221) Wolcott's records of *limbata* refer only to *radiata* (as *venusta*). I suspect that Wolcott's *limbata* was a mixture of both *limbata* and *radiata* because the material he sent to the U.S. National Museum for identification was *limbata*. Also Telford's series of *limbata* contained five specimens of *radiata* and a specimen of *Toxomerus lunus* out of a total of 23 specimens, and his series of *radiata* (as *venusta*) contained four specimens of *limbata* and a specimen of *lunus* out of a total of nine specimens. Clearly Telford's statements about these *Allograpta* species must not be taken literally as he was apparently unable to distinguish these species.

Allograpta species A

Distribution.—Jamaica*.

I have two broken males and one female of an *Allograpta* species apparently related to *neotropica* Curran and *insularis* Thompson from Jamaica, Hardwar Gap.

Baccha of authors, not Fabricius

The genus *Baccha* of previous authors was a large, diverse group of flies mostly with petiolate abdomens, partially yellow faces, and bare metasterna and of worldwide distribution. As presently understood and largely a result of the research of J. R. Vockeroth, *Baccha* is now restricted to a very small group (two Palaearctic, one Holarctic, and one Oriental species) of flies with simple unsegmented aedeagi. Most of the Old World tropical forms are now placed in either *Allobaccha* Curran or *Episyrphus* Matsumura. The endemic New World forms are divided into three genera, *Pseudodoros* Becker, *Ocyptamus* Macquart, and *Leucopodella* Hull (q.v.).

Genus *Pseudodoros* Becker

Pseudodoros Becker, 1903: 92. Type-species, *nigricollis* Becker (mono.).
Dioprosopa Hull, 1949a: 99. Type-species, *Syrphus clavatus* Fabricius (mono.).

Pseudodoros was originally described as a monotypic genus from Egypt. It is now considered to include *Dioprosopa* Hull, formerly a subgenus of *Baccha* Fabricius. *Pseudodoros* contains four species; *nigricollis* Becker, an Ethiopian species ranging from Egypt south to Rhodesia; *psyllidivora* Séguy, an Ethiopian species known only from the Ivory Coast; *clavatus* (Fabricius), a very common New World species ranging from the United States (Wisconsin) south to Brazil; and an undescribed Neotropical species from Peru.

Pseudodoros clavatus (Fabricius)

Syrphus clavatus Fabricius, 1794: 298. Type-loc.: "Americae meridionalis insulis." Lectotype ♀ MC*, see Appendix B. Subsequent reference: Zim-
 sen, 1964: 474 (type).

Baccha clavata: Fabricius, 1805: 200 (new combination); Wiedemann, 1830: 94 (redescript. based on types); Wulp, 1883: 10 (Guadeloupe); Roeder, 1885: 342 (Puerto Rico); Gundlach, 1887: 186 (Puerto Rico); Johnson, 1894: 276 (Jamaica); Townsend, 1895: 37 (Jamaica, descript. note); Williston, 1896: 347 (St. Vincent Is., synonymy; distr. notes); Coquillett, 1900: 252 (Puerto Rico); Ragues, 1908: 312 (Cuba); Johnson, 1908: 74 (Bahamas); Johnson, 1919: 434 (Jamaica); Wolcott, 1922: 7, figs. 7 (larva), 8 (pupa), 9 (adult) (Puerto Rico, life hist.), 1923: 218 (Puerto Rico; prey recs.); Gowdey, 1926: 79 (Jamaica); Curran, 1928b: 35 (Puerto Rico, Virgin Is.); Wolcott, 1936: 346 (Puerto Rico; biol. notes, prey recs., habitus fig.), 1941: 115 (Puerto Rico; prey rec.); Hull, 1943d: 48, fig. 7 (abdomen); Beatty, 1944: 148 (St. Croix); Wolcott, 1948: 461 (Puerto Rico; biol. notes, figs. adult, larva, puparium); Miskimen and Bond, 1970: 65 (St. Croix); Doesburg, 1970: 93, 96, 99 (Lesser Antilles; descript. notes); Boyes et al., 1971: 90, pl. 20, fig. 1 (karyotype), pl. 25, fig. 1 (idiogram) (chromosomes, Mexican and Puerto Rican populations); Telford, 1973: 228 (Puerto Rico).

Baccha (Dioprosopa) clavata: Hull, 1949a: 90, 99, 101, fig. 7 (abdomen).

Dioprosopa clavata: Hull, 1949b: 288, fig. 9a (head).

Pseudodoros clavatus: Thompson et al., 1976: 10.

Baccha elovisia clavata var. *minor* Stahl, 1883: 206 (Puerto Rico; *nomen nudum*; misspelling of specific name).

Distribution.—USA (California to Wisconsin and New Jersey), south to Peru and Argentina (Salta); Galápagos, Cuba*, Grand Cayman*, Jamaica*, Hispaniola*, Puerto Rico*, Virgin Islands*, Lesser Antilles (St. Martin, Saba, St. Eustatius, Barbuda, Antigua*, Montserrat*, Guadeloupe, Dominica*, St. Lucia, St. Vincent*, Barbados*).

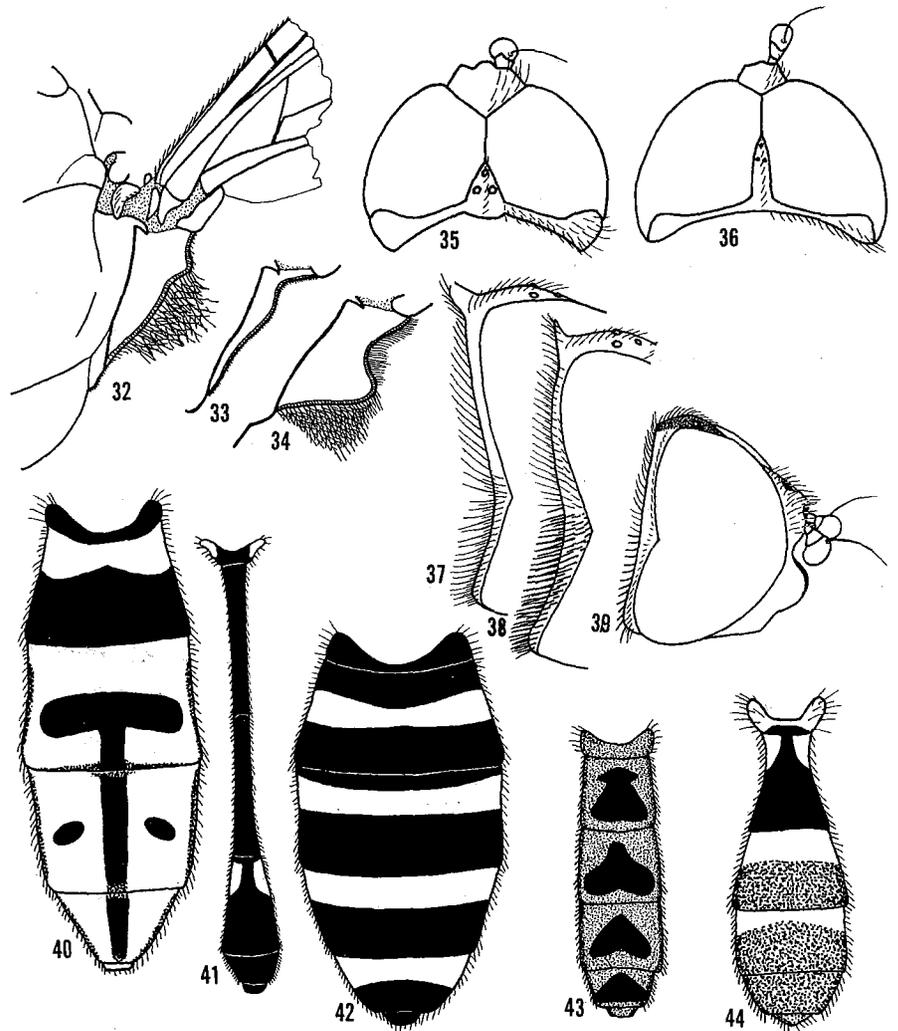


Fig. 32. *Ocyptamus cylindricus*, dorsal view of posterolateral portion of thorax. Figs. 33-34. Squamae, dorsals. 33, *O. parvicornis*. 34, *O. dimidiatus*. Figs. 35-36. Heads, dorsal. 35, *O. deceptor*. 36, *O. parvicornis*. Figs. 37-38. Occiputs, lateral. 37, *O. parvicornis*. 38, *O. dimidiatus*. Fig. 39. *O. ornatipes*, head, lateral. Figs. 40-44. Abdomens, dorsal. 40, *O. jactator*. 41, *O. oenone*. 42, *O. aequilineatus*. 43, *O. fasciatus*. 44, *O. capitatus*.

Genus *Ocyptamus* Macquart

Ocyptamus Macquart, 1834: 554. Type-species, *fascipennis* Macquart (Coquillett, 1910: 577) = *fuscipennis* Say.

Calostigma Shannon, 1927a: 8. Type-species, *elnora* Shannon (orig. des.).

Mimocalla Hull, 1943d: 46 (as a subgenus). Type-species, *Baccha capitata* Loew (orig. des.).

Orphnabaccha Hull, 1949a: 93. Type-species, *Baccha coerulea* Williston (orig. des.).

Mercurymyia Fluke, 1950a: 140. Type-species, *Syrphus caldus* Walker (orig. des.).

References: Curran, 1928b: 34 (key to 8 Puerto Rican spp.), 1941: 257–265 (key); Hull, 1949a: 100–135 (key); Telford, 1973 (key to 19 Puerto Rican spp.).

Ocyptamus is an endemic New World group, which has its greatest diversity in the Neotropics (15 Nearctic species, 300 Neotropical species). More than 25 species, representing some eight species groups, are known from the West Indies: *caldus* Walker group (= *Orphnabaccha* Hull, three species), *capitatus* Loew group (= *Mimocalla* Hull, one species), *cylindricus* Fabricius group (= *Ocyptamus*, *sensu stricto*, four species), *elnora* Shannon group (= *Calostigma* Shannon, one species), *lepidus* Macquart group (six species), *lineatus* Macquart group (two species), *parvicornis* Loew group (two species), *stenogaster* Williston group (four species), and five ungrouped species. All these species groups have additional species in the Neotropical Region and all except the *elnora* and *stenogaster* groups include species which extend into the Nearctic Region.

As with any such large group, the species of *Ocyptamus* are quite difficult to determine. No adequate key to the species of *Ocyptamus* exists. Curran's key (1941) includes less than half of the known species (121 out of 300 species) and Hull's key (1949a), while including most of the species (222 species), is very difficult to use and contains numerous errors. Both of these keys use facial color for their principal dichotomy, a character which is both difficult to evaluate and is variable in some species. The key presented here uses a different set of characters, some of which are new and are explained below. These characters may be found to be more useful. Most of the West Indian species have been placed into species groups, and these groups have been characterized. While these characterizations will be found to fit many mainland species, it is stressed that they are only preliminary, based solely on the Antillean fauna.

Occipital "cilia".—The type and arrangement of hairs on the lateral edge of the occiput are useful group characters (Figs. 37–39). The type of hair ranges from long thin hairs such as are found on the upper half of the occiput in *parvicornis* (Loew) (Fig. 37), to short thick scalelike hairs such as are found on the lower half of the occiput in *deceptor* (Curran). These hairs are usually arranged in regular rows, ranging from 5–6 rows in *dimidiatus* (Fabricius) (Fig. 38), to 1–2 rows in *parvicornis* (Loew) (Fig. 37). Frequently, the type and arrangement of the hairs is different on the upper and lower

portions of the occiput and rarely the type of hairs differs from row to row. Many species have multiple rows of thick scalelike hairs on the lower half and a single or double row of thin hairs on the upper half (cf. *rica* (Curran)), and sometimes the anterior row is greatly reduced as compared to the posterior ones (cf. *parvicornis* (Loew)). The condition found in species like *dimidiatus* (Fabricius) is here considered pleisomorphic, and the greatly reduced state found in *parvicornis* (Loew) is considered apomorphic.

Plumula.—The plumula is a plumelike extension of the subalar, apparently unique to syrphid flies (Girschner, 1897: 569; Lundbeck, 1916: 27). In *Ocyptamus*, it ranges from long and very hairy (*jactator* (Loew)) to completely absent (*capitatus* (Loew)). The absence of this character is considered the apomorphic state.

Squamae.—The squamae were studied in detail by Girschner (1897, syrphids on pp. 567–571, 586–589, 603–607), but his work has been almost completely overlooked by syrphid workers. Girschner showed that the relative sizes of the alar and thoracic lobes and the structure of the fringe were of great taxonomic importance. In *Ocyptamus* the size of the fringe ranges from long and abundant to nearly absent (Figs. 32–34). The size of the squamal lobes is correlated positively with this morphocline, that is, as the fringe becomes reduced, the size of the lobes is reduced. I consider the reduced state, as illustrated by *parvicornis* (Loew), to be apomorphic.

Shape of vertex and position of ocellar triangle.—This is interspecifically variable in *Ocyptamus*, ranging from that form found in the *stenogaster* group (Fig. 35) to that found in the *parvicornis* group (Fig. 36). The narrowing of the vertex and anterior displacement of the ocellar triangle appears to be positively correlated, that is, as the vertex narrows, the ocellar triangle appears to be displaced more anteriorly. I consider the condition found in the *parvicornis* group to be apomorphic.

Size and extent of microtrichia on alula.—These are also interspecifically variable in *Ocyptamus* (Figs. 52–55, 57, 58). The alula ranges from very broad as in *dimidiatus* (Fabricius) to absent as in *stenogaster* (Williston). It may be completely bare or microtrichose. The size of the alula and the extent of microtrichia on it are *not* correlated. I consider the bare and reduced states to be apomorphic.

Other characters that I have found of value in delimiting species groups of *Ocyptamus* but which have not previously been used for such purposes are the type of subscutellar fringe, the position of the anterior and apical crossveins, and the condition of the postmetacoxal bridge. The determination of the nature of the various character states as pleisomorphic or apomorphic was made solely on the distribution of those states within and without the genus *Ocyptamus*, that is, the pleisomorphic state or end of a

morphocline is the one which was found most often within *Ocyptamus* and among syrphids in general.

KEY TO WEST INDIAN SPECIES OF *OCYPTAMUS* MACQUART

1. Alula extensively bare or absent (Figs. 27, 59, 61–63, 65–66) 2
 - Alula present, completely microtrichose (Figs. 30–31, 53, 55, 57–58, 60, 64) 15
2. Alula greatly reduced or absent, about as wide as 2nd costal cell, always much narrower than 2nd basal cell (Figs. 27, 59, 61–63, 65–66) 5
 - Alula normal, always much broader than 2nd costal and 2nd basal cell (Figs. 54, 66) 3
3. Scutellum yellow; antenna orange; mesonotum yellow pollinose vittate; wing with 2nd basal cell bare (Fig. 66); plumula absent (Cuba, Puerto Rico) *capitatus* (Loew)
 - Scutellum black; antenna dark; mesonotum all dark, not vittate; wing with 2nd basal cell microtrichose (Fig. 54); plumula present . . 4
4. Face all yellow; wing with basal $\frac{1}{4}$ of anal cell and anal lobe bare, with transverse brown band across base of apical cell and apex of discal cell (Fig. 54); all tibiae dark brownish black (all islands) *cylindricus* (Fabricius)
 - Face yellow with medial black vitta; wing completely microtrichose, except bare alula, without such a transverse band; anterior tibia pale orange (southern USA, Cuba) *costatus* (Say)
5. Wing with apical crossvein distinctly sinuate (Fig. 62–63); male hindbasitarsus simple 6
 - Wing with apical crossvein straight and perpendicular (Fig. 65); male hindbasitarsus with apical bristles (Fig. 48a) (Puerto Rico) *ornatipes* (Curran)
6. Metasternum pilose; abdomen short, much shorter than wing (Jamaica) *iris* Austen
 - Metasternum bare; abdomen very elongate, as long as or longer than wings 7
7. Wing microtrichose except for bare alula; abdomen narrow, 2nd tergum about twice as long as its narrowest width 14
 - Wing bare basally, always with basal portions of costal, basal, and anal cells bare (Figs. 27, 62); abdominal width variable 8
8. Anal lobe attenuated at base (Figs. 59, 61); thorax completely reddish brown; male with 5th sternum produced into a pair of long posterior prongs (Fig. 50a) 13
 - Anal lobe not attenuated at base (Fig. 62); mesonotal disc and pec-

- tus dark, shiny purplish black to black; male 5th sternum unmodified 9
9. Abdomen very narrow, 2nd tergum at least 8× as long as its narrowest width; ocellar triangle only slightly in front of hind margin of eye (Fig. 35) 10
- Abdomen narrow, 2nd tergum at most only 4–5× as long as its narrowest width; ocellar triangle much before hind eye margin, usually 2–3× its length in front of hind margin of eye (as in Fig. 37) (Jamaica) *sagittifer* (Austen)
10. Wing with basal cells almost completely bare, only with a few scattered microtrichia on apical portion (Fig. 62) 11
- Wing with basal cells extensively microtrichose, always with at least apical 1/3 of 1st basal cell microtrichose 12
11. Face with black medial vitta; thoracic pleuron yellow only on posterior mesopleuron and upper sternopleuron; scutellum black (Puerto Rico) *deceptor* (Curran)
- Face yellow; thoracic pleuron mostly yellow, only anterior portion of mesopleuron and lower portions of sternopleuron, hypopleuron, and metapleuron black; scutellum yellow (Cuba) ... *hyacinthus* (Hull)
12. Scutellum yellow; face all yellow; thoracic pleuron mostly yellow, only lower portions (i.e. pectus) of sternopleuron and hypopleuron black; wing hyaline, with apical 1/2 of 1st basal and apical 1/3 of 2nd basal cell microtrichose (St. Vincent Is.) species A
- Scutellum dark reddish brown; face yellow, with brownish vitta under antenna and on upper part of tubercle; thoracic pleuron at most bright yellow on posterior mesopleuron and upper sternopleuron, diffusely yellow on upper posterior triangular portion of pteropleuron and upper pleurotergite, elsewhere black, frequently much darker, wing brownish (male) or hyaline (female), with apical 1/3 of 1st basal cell microtrichose, with only scattered microtrichia on apical portion of 2nd basal cell (Jamaica) *?oenone* (Hull)
13. Wing extensively bare medially, basal 1/2 of 2nd costal cell, basal 1/4 of apical cell, basal 1/2 of discal cell, basal 1/2 of cubital cell and between branches of Rs to level of anterior crossvein (Fig. 59); male genitalia with a prong on 8th tergum (Fig. 50b) (Puerto Rico) *ferrugineus*, new species
- Wings extensively microtrichose, all of discal and apical cells microtrichose, only basal 1/4 or less of 2nd costal and cubital cells bare, area between branches of Rs almost completely microtrichose (Fig. 61); male genitalia with prong on 9th sternum (Fig. 51b) (Florida, Cuba, Puerto Rico) *parvicornis* (Loew)
14. Basalar yellow; abdomen with basolateral margins of 3rd through 5th terga yellow (Puerto Rico) species B

- Basalar black; abdomen with basolateral margins of 3rd through 5th terga dark (Hispaniola) *oriel* (Hull)
- 15. Alula reduced, only as wide as 2nd costal cell (Figs. 53, 55); scutellum without a ventral pile fringe; plumula absent; yellowish to brownish-orange flies with similarly and uniformly colored wings 16
 - Alula broader, distinctly wider than 2nd costal cell (Figs. 30-31, 64); scutellum usually with a distinct ventral pile fringe; plumula usually present; other characters variable (*v.i.*) 18
- 16. Abdomen broad, distinctly broader than thorax; 2nd tergum broader than long; thoracic pleuron dark on posterior $\frac{1}{3}$, most of hypopleuron and pleurotergite dark brownish; occipital cilia mostly black on upper $\frac{1}{3}$ (Puerto Rico) *ricus* (Curran)
 - Abdomen narrow, rarely as broad as thorax, never broader; 2nd tergum longer than broad; thoracic pleuron almost completely yellow, at most with a narrow black or brown vitta stretching from posterior coxa to base of abdomen; occipital cilia all yellow 17
- 17. Thorax without black spot above hindcoxa; wing bare basally, basal $\frac{1}{4}$ of 2nd basal cell, basal $\frac{1}{3}$ of anal cell and anal lobe bare (Fig. 53) (Puerto Rico) *neoparvicornis* (Telford)
 - Thorax with black spot above hindcoxa; wing usually completely microtrichose, rarely with extreme bases of basal and anal cell and lobe bare (Fig. 55) (Florida, Cuba) *cubanus* (Hull)
- 18. Metasternum pilose; scutellum bright yellow; abdomen broad, extensively yellow or with broad yellow fasciae 19
 - Metasternum bare; scutellum usually dark, brown to black, rarely dirty yellow; abdomen narrow or petiolate, never extensively yellow nor with complete yellow fasciae, either with vittae or spots . . 21
- 19. Face all yellow; sides of mesonotum in front of suture, posterior mesopleuron, and upper sternopleuron yellow and densely golden pollinose; anterior 4 legs orange; hindfemur orange with broad preapical black annulus; wing with basal $\frac{1}{5}$ of 2nd costal cell, basal $\frac{2}{3}$ of 1st basal cell, basal $\frac{4}{5}$ of 2nd basal cell, and basal $\frac{1}{4}$ of anal cell bare (Fig. 30); abdomen extensively orange with black medial spots (Jamaica) *superbus*, new species
 - Face yellow with medial black vitta; other characters variable (*v.i.*) 20
- 20. Sides of mesonotum in front of suture, posterior mesopleuron, and upper sternopleuron yellow and densely golden pollinose; anterior legs orange; hindfemur orange with broad preapical black annulus; wing with basal $\frac{1}{2}$ of 2nd basal cell and basal $\frac{1}{4}$ of anal cell bare (Fig. 31); abdomen with yellow fasciae on basal $\frac{1}{3}$ of 2nd and 3rd terga, 4th and 5th terga yellow with black markings (Fig. 40) (Florida, Cuba) *jactator* (Loew)

- Mesonotum and pleuron bluish black, sparsely silvery white pollinose; legs black, except slightly more brownish on anterior 4 tibiae; wing completely microtrichose; abdomen with subbasal yellow fasciae on 3rd and 4th terga, with fascia or fasciate spots on 2nd tergum, and with basal yellow fascia on 5th tergum (Fig. 42) (Cuba, Jamaica) *aequilineatus* (Hull)
- 21. Wing completely microtrichose 22
 - Wing partially bare, always with 2nd basal cell bare on anterobasal $\frac{1}{2}$, frequently with 1st basal and anal cells bare on basal $\frac{1}{2}$ or more (Figs. 57, 58, 60, 64) 24
- 22. Wings uniformly pale yellowish brown; occipital cilia and pile reduced, with only 1 row of cilia on upper $\frac{1}{3}$ and 2-3 rows of hairs at ocular notch; pale flies, thorax extensively yellow, only mesonotal disc and pectus black; mesonotum yellow pollinose with shiny vittae; abdomen yellow vittate 27
 - Wings black on basal $\frac{2}{3}$ or more; occipital cilia and pile not reduced, with 2-3 rows of cilia on upper $\frac{1}{3}$ and 4-6 rows of hairs at ocular notch (Fig. 38); dark flies, thorax almost completely black, only notopleuron, posterior mesopleuron and postalar callus partially yellow; abdomen mostly black, rarely sides or basolateral corners yellowish, never vittate (Fig. 1) 23
- 23. Face yellow, scutellum yellow to brownish yellow; frontal triangle and lower front with yellow sides; notopleuron frequently yellow pilose (all islands?) *scutellatus* Loew
 - Face whitish yellow, with medial brown to black vitta; scutellum black; frontal triangle and lower front all dark; notopleuron black pilose (all islands?) *dimidiatus* (Fabricius)
- 24. Wing with 1st basal cell densely microtrichose, with black anterior portion and medial fascia (Fig. 64); abdomen dark, bluish black with opaque black triangles on each tergum (Fig. 43); thorax all dark; frontal triangle and front dark; face yellow with indistinct brownish vitta (Hispaniola, Puerto Rico) *fasciatus* Roeder
 - Wing with 1st basal cell bare on basal $\frac{1}{2}$ or more, hyaline or uniformly brownish, never with black marking (Fig. 60) 25
- 25. Abdomen with 1st tergum yellow laterally, with yellow spots on other terga; posterior mesopleuron, upper sternopleuron, humerus, notopleuron and postalar callus all yellow; face yellow, with or without brownish medial vitta; frontal triangle and lower front partially yellow, more than 7 mm 26
 - Abdomen all dark, bluish black with opaque black markings; thorax all dark, bluish black, sparsely silvery white pollinose on pleuron; face mainly bluish black, sides narrowly yellow; front all bluish