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# BLOW FLIES FROM VANUATU (NEW HEBRIDES), WITH DESCRIPTIONS OF THREE NEW SPECIES OF THE GENUS *ONESIA* (DIPTERA: CALLIPHORIDAE)[1]

**Hiromu Kurahashi**[2]

*Abstract.* Seventeen species of the genera *Calliphora, Onesia, Hemipyrellia, Lucilia, Chrysomya, Rhinia* and *Stomorhina* are recorded from Vanuatu. *Onesia pubescens* and *Chrysomya nigripes* are new to the locality. *Onesia apouna,* n. sp., *O. gonidecoides,* n. sp., and *O. santamaria,* n. sp., are described and figured. The blow fly fauna of Vanuatu is characterized by the dominance of the endemic and Indo-Australian forms. All 17 Vanuatuan species are keyed.

The calliphorid flies collected during an expedition to Vanuatu (New Hebrides), 5–15 February, 1978 (Tokyo Medical and Dental University Overseas Scientific Research Project, 1977), were studied. I also had a chance to examine some specimens on loan from Bishop Museum, Honolulu, and British Museum (Nat. Hist.), London. Out of a total 443 specimens, 17 species were represented. Three of these species are new to science and 2 are recorded for the first time from Vanuatu.

Bezzi (1927) described *Calliphora aruspex* and *Lucilia calviceps* from Vanuatu (then the New Hebrides). Rageau & Vervent (1958) listed 11 species of the Vanuatuan Calliphoridae. James (1971a) and Kurahashi (1971) described *Hemipyrellia aureocrura* and *Calliphora espiritusanta* from Espiritu Santo, respectively. The dominance of endemic (6 spp., 35%) and Indo-Australian forms (5 spp., 30%) is characteristic of the blow fly fauna in Vanuatu. The Indo-Australian elements include *Chrysomya nigripes* Aubertin, *Ch. albiceps rufifacies* (Macquart), *Ch. megacephala* (Fabricius), *Stomorhina xanthogaster* (Wiedemann) and *S. discolor* (Fabricius). The endemic species are *Calliphora aruspex* Bezzi, *Ca. espiritusanta* Kurahashi, *Hemipyrellia aureocrura* James and 3 new species of *Onesia.* It is likely that these endemic elements originated from the Australian or Indo-Australian ancestral stocks within the islands of Vanuatu. The Australian elements (4 spp.) make up about 24% of the total blow fly fauna in Vanuatu. *Onesia pubescens* (Macquart), *Lucilia calviceps* Bezzi, *Chrysomya varipes* (Macquart), and *Ch.* sp. nr *megacephala* (Fabricius) represent these Australian elements. *Lucilia cuprina* (Wiedemann) and *Rhinia apicalis* (Wiedemann) are pan-tropical species.

Abbreviations for institutions housing specimens are as follows: Bishop Museum, Honolulu (BPBM); British Museum (Nat. Hist.), London (BMNH); Tokyo Medical and Dental University (TMDU).

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## Key to the species of Vanuatuan Calliphoridae

1. Stem vein setulose above ..... 2
   Stem vein bare ..... 3
2. Thoracic squama with hairs on dorsal surface; subcostal sclerite setulose; infra-alar bulla usually setulose (if bare, then metallic blue and yellow flies as in *Eucompsomyia* Malloch) . . . subfamily **Chrysomyinae,** genus **Chrysomya** ..... 10
   Thoracic squama bare above; subcostal sclerite with fine pubescence; infra-alar bulla bare . . . subfamily **Rhiniinae** ..... 14
3. Thoracic squama more or less hairy on dorsal surface . . . tribe **Calliphorini** ..... 4
   Thoracic squama quite bare . . . tribe **Luciliini** ..... 8
4. Abdomen reddish on at least sides and venter; distance between right and left of presutural *ac* rather large . . . genus **Calliphora (Paracalliphora)** ..... 5
   Abdomen submetallic bronzy or metallic blue, more or less densely covered with gray dusting which is sometimes conspicuously tessellated . . . genus **Onesia** .... 6
5. Humeri reddish ..... **Calliphora espiritusanta**
   Humeri metallic dark colored, usually concolorous with thoracic dorsum ..... **Calliphora aruspex**
6. Epaulet black; squamae fuscous; prothoracic spiracle fuscous; antennae largely fuscous except for reddish joints of 2nd and 3rd segments; postgena with black hairs ..... **Onesia gonidecoides, n. sp.**
   Epaulet brownish; antennae largely reddish ..... 7
7. Prothoracic spiracle fuscous; squamae fuscous; eyes in ♂ closely approximated; postgena with black and yellow hairs ..... **Onesia apouna, n. sp.**
   Prothoracic spiracle yellowish orange; squamae yellowish brown; eyes in ♂ subholoptic, broader than width of ocellar triangle; posterior parts of jowls and postgena with yellowish white hairs ..... **Onesia pubescens**
   Prothoracic spiracle fuscous; squamae fuscous; eyes in ♂ slightly less than width of ocellar triangle; postgena with black and yellow hairs .... **Onesia santamaria, n. sp.**
8. Supraspiracular convexity clothed with long, upstanding fine hairs ..... **Hemipyrellia aureocururа**
   Supraspiracular convexity bare or pubescent . . . genus **Lucilia** ..... 9
9. Basicosta black; subcostal sclerite with setulose hairs apically; postsutural *ac* 2 .... **Lucilia calviceps**
   Basicosta yellow; subcostal sclerite pubescent; postsutural *ac* 3 ..... **Lucilia cuprina**
10. Prothoracic spiracle white ..... 11
    Prothoracic spiracle fuscous ..... 13
11. Legs metallic black; parafacialia fuscous, densely silver-dusted; wings hyaline in ♂ and ♀; fore femur in ♂ with no conspicuous white hairs ..... 12
    Legs testaceous yellow in part; parafacialia orange, densely yellow-dusted; fore femur in ♂ with dense erect hairs on dorsal ⅔ ..... **Chrysomya varipes**
12. Sternopleuron with a single *st*; tergite 5 with black hairs only; eyes dichoptic in ♂ and ♀ ..... **Chrysomya nigripes**
    *St* 1+1; tergite 5 with black hairs intermixed with yellow ones; eyes in ♂ holoptic, dichoptic in ♀ ..... **Chrysomya albiceps rufifacies**
13. Body stout but rather elongate, submetallic dark blue; thoracic squama largely blackish; vibrissaria, medianae and facialia with black hairs ..... **Chrysomya sp. nr megacephala**

Body stout and rounded, metallic green; thoracic squama largely dark brown; vibrissaria, medianae and facialia only with yellow hairs .... **Chrysomya megacephala**

14. $R_5$ petiolate; sternopleuron glossy, without dusting; mesopleuron without setigerous spots; mesopleural row of bristles incomplete; legs yellow; tergite 1+2 with a row of long marginal bristles ..... **Rhinia apicalis**

$R_5$ open in wing margin or closed; if petiolate then sternopleuron is heavily dusted ... genus **Stomorhina** ..... 15

15. $R_5$ petiolate; *h* 2–3; sternopleuron densely dusted; thoracic squama lobulate ..... **Stomorhina xanthogaster**

$R_5$ open in the margin; *h* 1; anterior part of sternopleuron largely glossy, without dusting; thoracic squama not lobulate, inner margin diverging from scutellum . ..... **Stomorhina discolor**

## **Calliphora (Paracalliphora) aruspex** Bezzi

*Calliphora (Proekon) aruspex* Bezzi, 1927, Bull. Entomol. Res. **17:** 244.—Rageau & Vervent, 1958, Arthropodes Inter. Med. Vet. Nouv.-Hebrides, p. 35.
*Calliphora (Paracalliphora) aruspex:* Kurahashi, 1971, Pac. Insects **13:** 184.

Length: 7.0–9.5 mm.

*Specimens examined.* EFATE: 1♂, Pango Pt., 0–50 m, 19.III.1970 (N.L.H. Krauss) (BPBM). TANNA: 3♀, IX.1930 (L.E. Cheesman) (BMNH); 10♂,8♀, 23.I.1923 (E. Robertson) (BPBM).

*Bionomics.* Adults are attracted to decaying meat in native forests.
*Distribution.* Vanuatu (Efate and Tanna).

## **Calliphora (Paracalliphora) espiritusanta** Kurahashi

*Calliphora (Paracalliphora) espiritusanta* Kurahashi, 1971, Pac. Insects **13:** 180.
*Calliphora (Anastellorhina) augur:* Rageau & Vervent, 1958, Arthropodes Inter. Med. Vet. Nouv.-Hebrides, p. 35 (probably misident.).

Length: 8.0–9.5 mm.

*Specimens examined.* ESPIRITU SANTO: holotype ♂ and 3♂,1♀ paratypes, above Namatasopa, 400 m, 30–31.VIII.1957 (J.L. Gressitt) (BPBM).

*Bionomics.* Nothing is known.
*Distribution.* Vanuatu (Espiritu Santo).

## **Onesia apouna** Kurahashi, **new species** Fig. 1

♂. *Head:* eyes bare, separated at narrowest point by slightly more than the width of anterior ocellus; frons index 0.02; frontal stripe reddish black, widened anteriorly and posteriorly, reduced to a fine line at narrowest point; parafrontalia narrow, yellowish-gray dusted, with black setulae, provided with about 7 pairs of *ori* and several fine interstitials; parafacialia dark yellowish-gray dusted, black setulose above; face fuscous, dark gray, without median carina; facialia fuscous brown, setulose on lower ⅓; medianae and vibrissaria brown; vibrissae well developed; jowls and postgena black, dark gray dusted, clothed with black hairs, but postgena with yellow hairs posteriorly; occiput concolorous with jowls, clothed with blackish hairs except for yellow ones on central portion; antennae reddish, slightly darkened on dorsal surface of apex, the 3rd segment slightly more than 2× as long as 2nd; arista fuscous, long plumose on

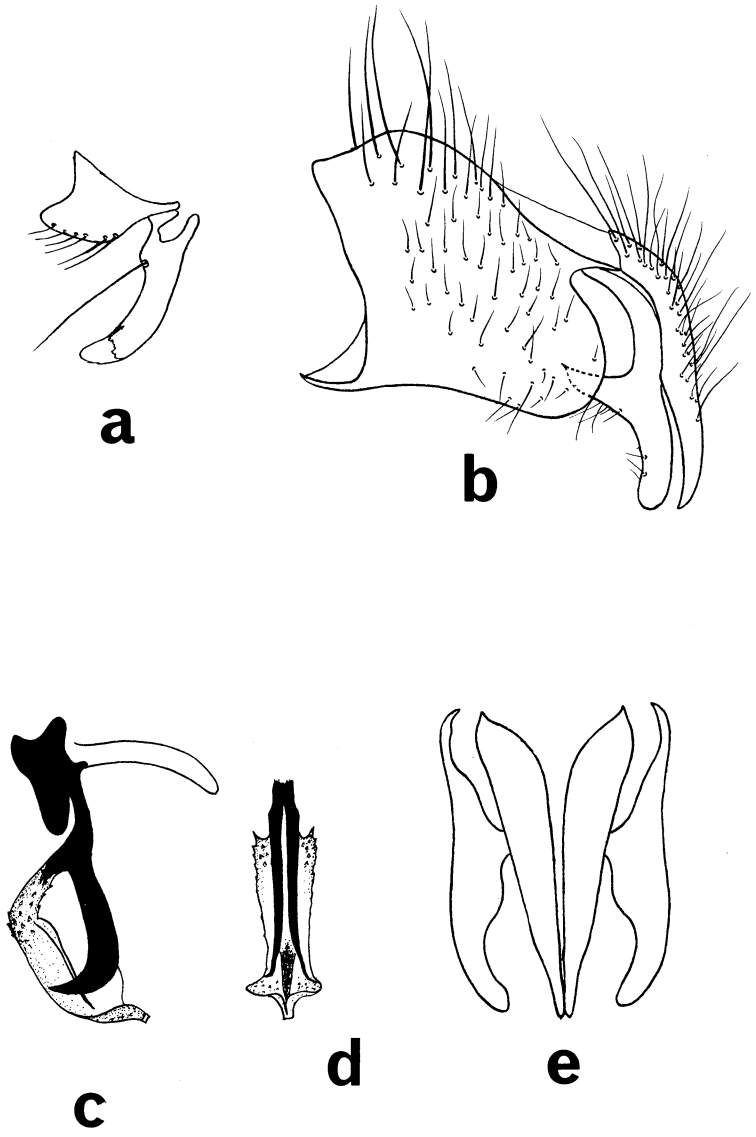


FIG. 1. *Onesia apouna,* ♂ hypopygium: **a,** anterior and posterior parameres, lateral view; **b,** epandrium, cercus and paralobus, lateral view; **c,** aedeagus, lateral view; **d,** aedeagus without basal portion, posterior view; **e,** cerci and paralobi, caudal view.

basal ¾; palpi yellowish brown. *Thorax:* black, with greenish tinge, rather densely covered with gray dusting; scutellum, humeri and postalar calli concolorous with scutum; prosternum and propleura setulose; supraspiracular convexity bare; prothoracic and metathoracic spiracles fuscous; pleurotergite with a patch of black setulae; postalar declivity with tuft of blackish hairs in central portion, a few black setulae present on posterior upper portion; tympanic tuft of

blackish hairs present; suprasquamal ridge with anterior parasquamal tuft of black hairs. Chaetotaxy: *ac* 2+3, *dc* 3+3, *ia* 1+2, *h* 3, *ph* 3, *prs* 1, *sa* 3, *pa* 2, *st* 2+1, *sc* 4+1, prostigmatal and propleural bristles developed. *Wings:* hyaline with brown tinge basally; veins fuscous brown; epaulet and basicosta reddish brown; subcostal sclerite brown, pubescent; node of 2nd and 3rd longitudinal veins with several black setulae above and below; 4th longitudinal vein bent with right angle, section of the 4th vein from bend to wing margin distinctly inflexed; squamae entirely fuscous, thoracic one lobulated, with fuscous hairs on upper surface. Halteres yellowish brown. *Legs:* black, with blackish hairs; front tibia with 1 *p* and 3 short *ad*; mid tibia with 1 *ad*, 2 *p* and 1 *v*; hind tibia with incomplete row of 5 *ad*, 2–3 *pd* and 1 *av*. *Abdomen:* metallic olivaceous green, gray dusted, clothed with black hairs; tergites 3–4 with a trace of dark longitudinal median stripe; tergites 1+2–3, each with decumbent lateral marginal bristles; tergites 4–5 with row of erect marginal bristles, tergite 5 with several fine bristles on disc; hypopygium small, as shown in Fig. 1.

♀. *Head:* eyes dichoptic; frons index 0.23–0.24; frontal stripe broad, black, sometimes slightly reddish anteriorly, slightly narrowed on middle of frons, slightly more than 2× the width of 1 of parafrontalia just in front of anterior ocellus; parafrontalia provided with about 8 pairs of *ori*; *ors* 2+1; *oc* developed; *acoc* minute; *ov* and *iv* well developed; *poc* divergent; *occ* 1. *Legs:* mid tibia with 2 *ad*, 1 *pd*, 2 *p* and 1 *v*; hind tibia with 3 *ad*, 1 *pd* and 2–3 *av*. *Abdomen:* metallic olivaceous green with copper tinge, slightly gray dusted; tergite 3 with decumbent marginals on lateral sides; tergite 4 with a row of decumbent marginals. Ovipositor short. Otherwise same as for ♂.

Length: 6.0–6.5 mm.

Holotype ♂, ESPIRITU SANTO: Apouna Riv, camp 3–1000 ft (3–900 m), 9–11.IX.1971 (G.S. Robinson, Roy. Soc. Exped.) (BMNH). Paratypes: 2♀, same data as holotype (BMNH). Holotype and paratypes are preserved in the British Museum (Nat. Hist.), London.

*Remarks.* The specific name is derived from the name of locality where these type specimens were collected.

*Bionomics.* Unknown.

*Distribution.* Vanuatu (Espiritu Santo).

## **Onesia gonidecoides** Kurahashi, **new species** Fig. 2

♂. *Head:* eyes bare, separated at narrowest point by slightly less than the width of ocellar triangle; frons index 0.05; frontal stripe blackish, widened anteriorly and posteriorly, reduced to a fine line at narrowest point; parafrontalia narrow, dark gray dusted, with black setulae provided with about 12 pairs of *ori* and several fine interstitials, parafacialia dark gray, blackish setulose above; face black, slightly dark gray dusted, with a trace of median carina at base of antennae; facialia fuscous brown, setulose on lower ⅓; medianae and vibrissaria dark brown; vibrissae well developed; jowls and postgena black, dark gray dusted, clothed with black hairs, but postgena with a few brownish hairs posteriorly; occiput concolorous with jowls, clothed with black hairs except for yellow ones on central portion; antennae fuscous, reddish on bases of 3rd segment ventrally, the 3rd segment 2× as long as 2nd; arista blackish, long plumose on basal ⅔; palpi orange. *Thorax:* black, with bluish tinge, covered with brownish-gray dusting; scutellum, humeri and postalar calli concolorous with dorsum; prosternum and propleura setulose; supraspiracular convexity bare; prothoracic and metathoracic spiracles fuscous; pleurotergite with a patch of brown to black setulae; postalar declivity with tuft of black hairs in central portion, posterior upper portion blackish setulose; tympanic tuft not developed, only

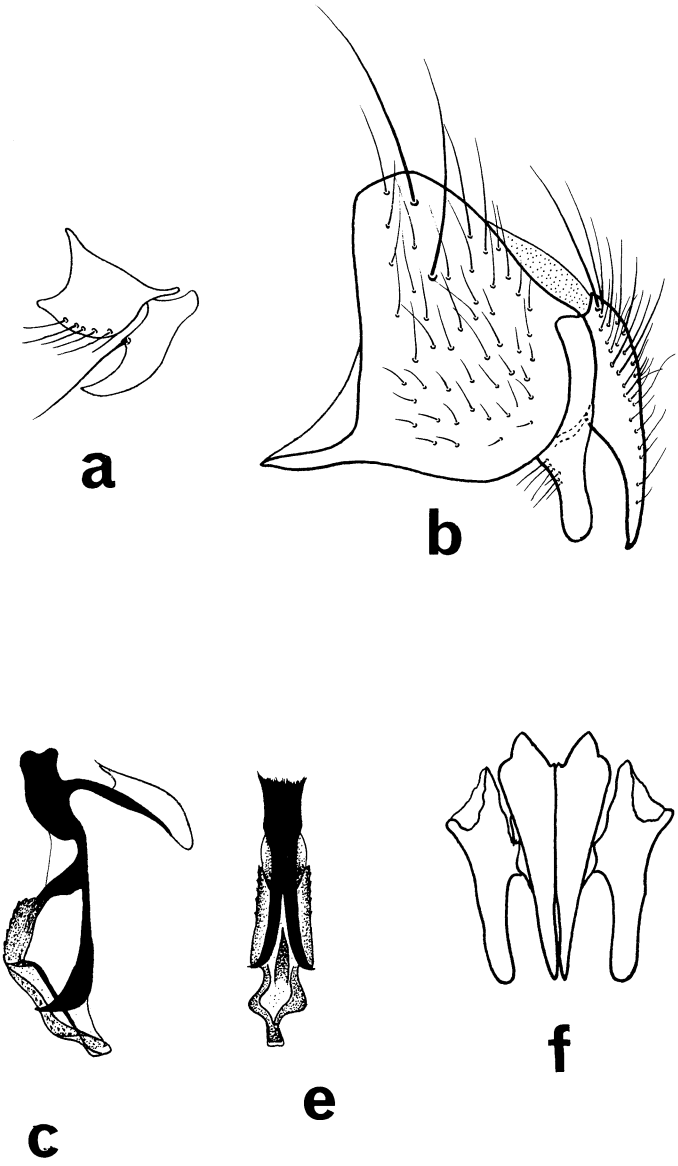


FIG. 2. *Onesia gonidecoides,* ♂ hypopygium: **a,** anterior and posterior parameres, lateral view; **b,** epandrium, cercus and paralobus, lateral view; **c,** aedeagus, lateral view; **d,** aedeagus without basal portion, posterior view; **e,** cerci and paralobi, caudal view.

a few black hairs are present; suprasquamal ridge bare except for a few black setulae on anterior parasquamal area. Chaetotaxy: *ac* 2+3, *dc* 3+3, *ia* 1+2, *h* 3, *ph* 3, *prs* 1, *sa* 3, *pa* 2, *st* 2+1, *sc* 3+1, prostigmatal and propleural bristles well developed. *Wings:* hyaline, with brown ridge basally; veins brown; epaulet blackish; basicosta yellow; subcostal sclerite brown, pubes-

cent; node of 2nd and 3rd longitudinal veins with several black setulae above and below; 4th longitudinal vein bent with distinct obtuse angle; section of 4th vein from bend to wing edge slightly inflexed; squamae entirely fuscous, thoracic one lobulated, with fuscous brown hairs on upper surface. Halteres brown, with blackish apex. *Legs:* black, with blackish hairs; front tibia with 1 *p* and 4–5 short *ad*; mid tibia with 1 long and 2 short *pd,* but without *v*; hind tibia with 2 *ad* and 2 *pd,* 1 strong and 2 fine *av* present. *Abdomen:* metallic bluish green, thinly silver-gray dusted, clothed with black hairs; tergites 1+2–3 with several long lateral marginal bristles; tergites 4–5 with a row of marginal bristles; tergite 5 with several fine bristles on disc; hypopygium small, as shown in Fig. 2.

Length: 5.5 mm.

Holotype ♂, ESPIRITU SANTO: Namatasopa, 300 m, light trap, 29.VIII.1957 (J.L. Gressitt) (BPBM 12,589). Holotype is preserved in the Bishop Museum, Honolulu.

*Remarks.* The present new species can be distinguished from the latter by the following characteristics: *ia* 1+2; no *v* on mid tibia; shape of male genitalia. The specific name is derived from the affinity with the New Caledonian species *O. gonideci* Kurahashi et Fauran.

*Bionomics.* Unknown.

*Distribution.* Vanuatu (Espiritu Santo).

**Onesia santamaria** Kurahashi, **new species** Fig. 3

♂. *Head:* eyes bare, separated at narrowest point by slightly less than the width of ocellar triangle; frons index 0.06; frontal stripe black, reddish anteriorly, widened anteriorly and posteriorly, narrowed at narrowest point, but not reduced to a fine line; parafrontalia narrow, dark gray dusted, with black setulae, provided with about 10 pairs of *ori* and several fine interstitials; parafacialia dark gray, blackish setulose above; face fuscous, dark gray dusted, without median carina; facialia fuscous brown, setulose on lower ½; medianae and vibrissaria reddish brown; vibrissae well developed; jowls and postgena black, dark gray dusted, clothed with black hairs, but postgena with yellow hairs posteriorly; occiput concolorous with jowls, clothed with blackish hairs except for yellow ones on central portion; antennae reddish orange, darkened apically, the 3rd segment 4× as long as 2nd; arista dark brown, long plumose on basal ¾; palpi yellowish orange. *Thorax:* black with bluish tinge, gray dusted; humeri, postalar calli and scutellum concolorous with scutum, postalar calli sometimes reddish along sutures; prosternum and propleura setulose; supraspiracular convexity bare; prothoracic and metathoracic spiracles fuscous, prothoracic one sometimes with yellowish tinge; pleurotergite with a patch of black setulae; postalar declivity with tuft of sparse black hairs in central portion; tympanic tuft not developed, only a few blackish hairs are present; suprasquamal ridge bare except for a few blackish setulae on anterior parasquamal area. Chaetotaxy: *ac* 2+3, *dc* 2–3+3, *ia* 1+2, *h* 3, *ph* 2, *prs* 1, *sa* 3, *pa* 2, *st* 2+1, *sc* 3+1, prostigmatal and propleural bristles developed. *Wings:* hyaline, with yellow tinge basally; veins yellowish brown; epaulet reddish brown; basicosta orange; subcostal sclerite yellowish brown, pubescent; node of 2nd and 3rd longitudinal veins with several black setulae above and below; 4th longitudinal vein bent with distinct obtuse angle; section of 4th vein from bend to wing edge slightly inflexed; squamae entirely fuscous brown, thoracic one lobulated with blackish hairs on upper surface. Halteres yellowish brown. *Legs:* black, with blackish hairs; front tibia with 1 *p* and 4–5 short *ad*; mid tibia with 1 *ad* and 2 *p,* without *v*; hind tibia missing. *Abdomen:* metallic blue, gray dusted,

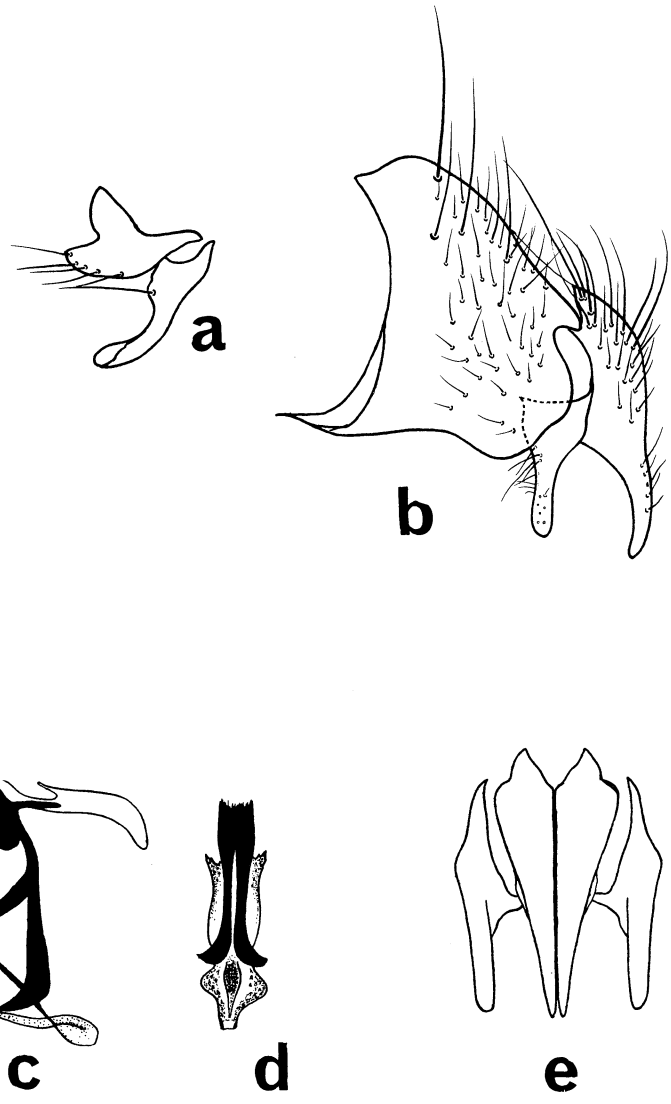


FIG. 3. *Onesia santamaria,* ♂ hypopygium: **a,** anterior and posterior parameres, lateral view; **b,** epandrium, cercus and paralobus, lateral view; **c,** aedeagus, lateral view; **d,** aedeagus without basal portion, posterior view; **e,** cerci and paralobi, caudal view.

clothed with black hairs; tergites 4–5 with row of marginal bristles; tergite 5 with several fine bristles on disc; hypopygium small, as shown in Fig. 3.

Length: 6.5 mm.

Holotype ♂, BANKS IS: Santa Maria I, Gaua, Nombur, 15.X.1922 (T.T. Barnard, BM 1922-371) (BMNH). Holotype is preserved in the British Museum (Nat. Hist.), London.

*Remarks.* The specific name is derived from the name of island where this type specimen was collected.

*Bionomics.* Unknown.

*Distribution.* Vanuatu (Banks Is).

**Onesia pubescens** (Macquart, 1851) Fig. 4

*Calliphora pubescens* Macquart, 1851, Mem. Soc. Sci. Agric. Lille **1850:** 242.
*Onesia pubescens:* James & Kurahashi, 1976, Steenstrupia **4:** 20.

♂. *Head:* eyes bare, separated at narrowest point by more than the width of ocellar triangle; frons index 0.07–0.10; frontal stripe reddish black, broader than width of anterior ocellus at narrowest point, widened anteriorly and posteriorly; parafrontalia narrow, gray dusted, with black setulae, provided with about 10 pairs of *ori* and several fine interstitials; parafacialia yellowish-gray dusted, blackish setulose above; face fuscous reddish on lower ⅓, yellowish-gray dusted, without median carina at base of antennae; facialia reddish brown, setulose on lower ½; medianae and vibrissaria brown; vibrissae well developed; jowls and postgena black except for anterior ½ of jowls reddish, dark gray dusted, with black hairs except for yellowish ones on posterior portion of jowls and postgena; occiput concolorous with jowls, clothed with blackish hairs except for yellow ones on central portion; antennae largely reddish, darkened apically, the 3rd segment 3× as long as 2nd; arista reddish, long plumose on ¾; palpi yellowish orange. *Thorax:* black, with bluish tinge, rather densely covered with gray dusting; humeri, postalar calli and scutellum concolorous with scutum; prosternum and propleura setulose; supraspiracular convexity bare; prothoracic spiracle yellow, metathoracic one fuscous; pleurotergite with patch of black setulae; postalar declivity with tuft of black hairs in central portion; tympanic tuft not developed; suprasquamal ridge bare except for a few blackish setulae on anterior parasquamal area. Chaetotaxy: *ac* 2+3, *dc* 3+3, *ia* 1+2, *h* 3, *ph* 2–3, *prs* 1, *sa* 3–4, *pa* 2, *st* 2+1, *sc* 3–4+1, prostigmatal and propleural bristles developed. *Wings:* hyaline, with brown tinge basally; veins brown; epaulet reddish brown to fuscous; basicosta yellow; subcostal sclerite yellowish brown, pubescent; node of 2nd and 3rd longitudinal veins with a few black setulae above and below; 4th longitudinal vein bent with distinct right angle, section of the 4th vein from bend to wing edge slightly inflexed on basal ½; squamae yellowish brown, thoracic one lobulated, with fuscous hairs on upper surface. Halteres yellow. *Legs:* black, with black hairs; front tibia with 1 *p* and 5 short *ad*; mid tibia with 1 long and 1 short *ad*, 1 *pd*, 2 *p* and 1 *v*; hind tibia with incomplete row of 2 strong *ad* and several short *ad*, 2 *pd* and 2 short *pd* and 2 *av*. *Abdomen:* metallic bluish green, silver dusted, clothed with black hairs; tergite 1+2–3 with strong lateral marginal bristles; tergites 4–5 with a row of strong marginal bristles; tergite 5 with several fine discals; hypopygium small, as shown in Fig. 4.

♀. *Head:* eyes separated at vertex by a distance equal to 0.27 of head width; frontal stripe reddish black, slightly narrowed posteriorly, slightly more than 3× the width of 1 of parafrontalia just in front of anterior ocellus; parafrontalia provided with about 9 pairs of *ori*; *ors* 2+1; *oc* developed; *acoc* absent; *ov* and *iv* well developed; *poc* parallel or divergent; *occ* 1. *Abdomen:* metallic blue, silver-gray dusted; tergite 3 with decumbent marginals on lateral sides; tergites 4–5 with a row of decumbent marginals. Ovipositor short. Otherwise same as for ♂.

Length: 4.0–9.0 mm.

*Specimens examined.* BANKS IS: 2♂,1♀, Santa Maria I, Gaua, Nombur, 8.X.1922, 13.X.1922 (T.T. Barnard) (BMNH). ESPIRITU SANTO: 1♂, above Namatasopa, 400 m, 31.VIII.1957 (J.L. Gressitt) (BPBM); 1♀, below Namatasopa, 250 m, 1.IX.1957 (Gressitt) (BPBM); 1♀, Tasmalum, 3 m, 4.IX.1957 (Gressitt) (BPBM). PENTECOST I: 1♂,5♀, 14.III.1964, 23.III.1964, 26.III.1964 (R. Straatman) (BPBM).

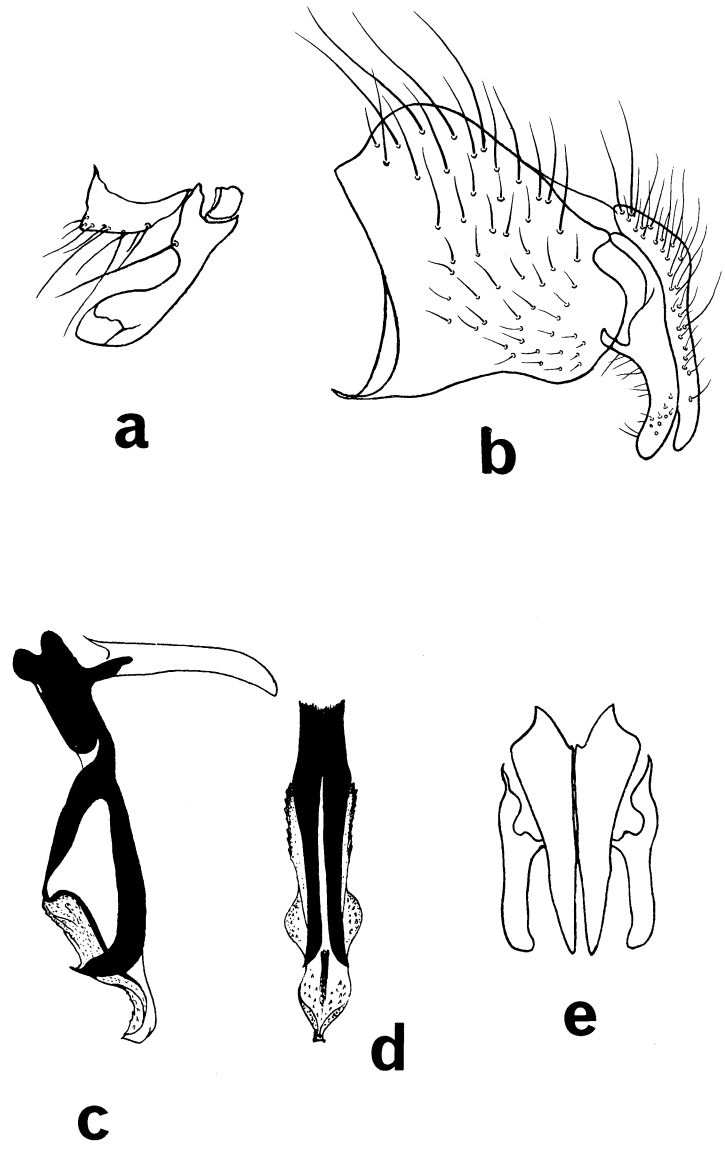


FIG. 4. *Onesia pubescens*, ♂ hypopygium: **a,** anterior and posterior parameres, lateral view; **b,** epandrium, cercus and paralobus, lateral view; **c,** aedeagus, lateral view; **d,** aedeagus without basal portion, posterior view; **e,** cerci and paralobi, caudal view.

MALEKULA: 1♂,4♀, Lakatoro, 23–29.IX.1967 (J. & M. Sedlacek) (BPBM); 4♀, N Lakatoro, 22–30.IX.1967 (Sedlacek) (BPBM); 1♂, Ounua, IV–V.1929 (L.E. Cheeseman, BM 1922-371) (BMNH); 2♂, 14.VI.1925 (P.A. Buxton) (BMNH). EPI: 1♂, Vaemali, 8.VIII.1967, malaise trap (Sedlacek) (BPBM); 1♂, 12.VI.1925 (Buxton) (BMNH). MAI: 1♂, 11.VII.1925 (Buxton) (BMNH). EFATE: 1♀, limestone plateau, N of Maat, 100 m, 18.VIII.1957 (Gressitt) (BPBM); 1♀, Vila, 0–100 m, III.1970 (Krauss) (BPBM); 2♀, 10 km NW of Vila, 12–

14.II.1978 (Kurahashi & Shima) (TMDU). EROMANGA: 1♀, Numpon, 250 m, 28.II.1964 (Straatman) (BPBM). TANNA: 1♂,2♀, Lenakel, 0–150 m, 0–200 m, I.1973, III.1970 (Krauss) (BPBM); 1♂, Loounapkaulangeus, 300–400 m, 3.III.1970 (Krauss) (BPBM).

*Bionomics.* Unknown.

*Distribution.* Vanuatu (Banks Is, Espiritu Santo, Pentecost I, Malekula, Epi, Efate, Eromanga, Tanna), Loyalty Is, New Caledonia, Bismarck Arch. and Australia (New South Wales) (Kurahashi & Fauran 1980).

## **Hemipyrellia aureocrura** James

*Hemipyrellia aureocrura* James, 1971a, Pac. Insects **13:** 5.

Length: 7.0–10.0 mm.

*Specimens examined.* EFATE: 20♂,52♀, 10 km NW of Vila, 8–11.II.1978, 12–14.II.1978 (Kurahashi & Shinonaga) (TMDU); 1♀, limestone plateau, N of Maat, 100 m, 20.VIII.1957 (Gressitt) (BPBM). ESPIRITU SANTO: 3♂,5♀, 25 km NW of Rougainville, 8–11.II.1978 (Kurahashi) (TMDU); 1♂,1♀, Tasmalum, 3 m, 4.IX.1957, ex fresh human excrement (Gressitt) (BPBM).

*Bionomics.* Adults are attracted to decaying meat in native forests.

*Distribution.* Vanuatu (Efate, Espiritu Santo).

## **Lucilia calviceps** Bezzi

*Lucilia calviceps* Bezzi, 1927, Bull. Entomol. Res. **17:** 238.—James, 1971a. Pac. Insects **13:** 7.—Rageau & Vervent, 1958, Arthropodes Inter. Med. Vet. Nouv.-Hebrides, p. 35.

Length: 7.0–10.5 mm.

*Specimens examined.* EFATE: 28♂,25♀, 10 km NW of Vila, 12–14.II.1978 (Kurahashi & Shinonaga) (TMDU). ESPIRITU SANTO: 7♂,16♀, 25 km NW of Rougainville, 8–11.II.1978 (Kurahashi & Shima) (TMDU).

*Bionomics.* Adults are attracted to decaying meat in forests.

*Distribution.* Vanuatu (Efate, Espiritu Santo), Loyalty Is, New Caledonia (Kurahashi & Fauran 1980), New Ireland, New Britain and New Guinea (James 1971a).

## **Lucilia cuprina** (Wiedemann)

*Musca cuprina* Wiedemann, 1830, Auss. Zweifl. Insekten **2:** 654.
*Lucilia (Phaenicia) cuprina:* Rageau & Vervent, 1958, Arthropodes Inter. Med. Vet. Nouv.-Hebrides, p. 35.

Length: 5.0–10.0 mm.

*Specimens examined.* EFATE: 2♀, 10 km NW of Vila, 12–14.II.1978 (Kurahashi) (TMDU). ESPIRITU SANTO: 5♂,3♀, 25 km NW of Rougainville, 8–11.II.1978 (Kurahashi) (TMDU).

*Bionomics.* Adults are found around garbage in dumps and human dwellings.

*Distribution.* Widely distributed in the temperate and tropical zones of the world.

**Chrysomya varipes** (Macquart)

*Lucilia varipes* Macquart, 1850, Dipt. Exot., Suppl. **4:** 259.
*Chrysomyia varipes:* Rageau & Vervent, 1958, Arthropodes Inter. Med. Vet. Nouv.-Hebrides, p. 35.

Length: 4.0–6.5 mm.

*Specimens examined.* EFATE: 13♂,34♀, 10 km NW of Vila, 12–14.II.1978 (Kurahashi & Shinonaga) (TMDU). ESPIRITU SANTO: 2♂,1♀, 25 km NW of Rougainville, 8–11.II.1978 (Kurahashi) (TMDU).

*Bionomics.* Adults are commonly found in forests and are attracted to decaying meat.

*Distribution.* Vanuatu (Efate, Espiritu Santo), New Caledonia (Kurahashi & Fauran 1980), Fiji, Australia (Queensland: Bezzi 1927; New South Wales: Malloch 1927), New Guinea (James 1971b).

**Chrysomya nigripes** Aubertin

*Chrysomya (Microcalliphora) nigripes* Aubertin, 1932, Ann. Mag. Nat. Hist., ser. 10, **9:** 26.

This species is newly recorded from Vanuatu.

Length: 6.0–7.0 mm.

*Specimens examined.* EFATE: 8♂,13♀, 10 km NW of Vila, 12–14.II.1978 (Kurahashi) (TMDU). ESPIRITU SANTO: 10♂,14♀, 25 km NW of Rougainville, 8–11.II.1978 (Kurahashi) (TMDU).

*Bionomics.* Adults are found in forests and are attracted to decaying meat.

*Distribution.* Vanuatu (Efate, Espiritu Santo), Sri Lanka (Senior-White et al. 1940), S China, Vietnam (Fan 1965), Thailand (Tumrasvin et al. 1979), and Malaysia (Inder Singh et al. 1979).

**Chrysomya albiceps rufifacies** (Macquart)

*Lucilia rufifacies* Macquart, 1843, Mem. Soc. R. Sci. Agric. Lille (**1842**): 303, (**1843**): 146.
*Chrysomya rufifacies:* Rageau & Vervent, 1958, Arthropodes Inter. Med. Vet. Nouv.-Hebrides, p. 35.

Length: 7.0–10.0 mm.

*Specimens examined.* EFATE: 11♂,7♀, 10 km NW of Vila, 12–14.II.1978 (Shinonaga & Kurahashi) (TMDU). ESPIRITU SANTO: 13♂,6♀, 25 km NW of Rougainville, 8–11.II.1978 (Kurahashi) (TMDU).

*Bionomics.* Larvae are predacious and attack other larvae of Calliphoridae, Sarcophagidae and Muscidae found in the same breeding place. *Ch. a. rufifacies* is also known to be involved in secondary myiasis and may be a primary cause under certain circumstances.

*Distribution.* Widely distributed in the Oriental and Australasian regions.

**Chrysomya sp. nr megacephala** (Fabricius)

This species is probably new to science and will be described in a separate paper.

Length: 8.5–10.0 mm.

*Specimens examined.* EFATE: 20♂,22♀, 10 km NW of Vila, 12–14.II.1978, 8–11.1978 (Kurahashi & Shinonaga) (TMDU). ESPIRITU SANTO: 14♂,11♀, 25 km NW of Rougainville, 8–11.II.1978 (Kurahashi) (TMDU).

*Bionomics.* Adults are found only in native forests.

*Distribution.* Vanuatu (Efate, Espiritu Santo), New Caledonia (Kurahashi & Fauran 1980) and Fiji (Kurahashi 1981).

### **Chrysomya megacephala** (Fabricius)

*Musca megacephala* Fabricius, 1794, Entomol. Syst. **4:** 317.
*Chrysomya megacephala:* Rageau & Vervent, 1958, Arthropodes Inter. Med. Vet. Nouv.-Hebrides, p. 35.

Length: 8.5–10.0 mm.

*Specimens examined.* EFATE: 1♂, 10 km NW of Vila, 12–14.II.1978, Kurahashi (TMDU). ESPIRITU SANTO: 1♀, 25 km NW of Rougainville, 8–11.1978 (Kurahashi) (TMDU).

*Bionomics.* Adults are commonly found on garbage in dumps and human dwellings. This is a common scavenger and sometimes produces myiasis of man and domestic animals.

*Distribution.* Widely distributed in the Oriental and Australasian regions and recently introduced into the Afrotropical and Neotropical regions (Kurahashi 1978, Guimaraes et al. 1978, Baez et al. 1981).

### **Rhinia apicalis** (Wiedemann)

*Idia apicalis* Wiedemann, 1830, Auss. Zweifl. Insekten **2:** 354.
*Rhinia testacea:* Rageau & Vervent, 1958, Arthropodes Inter. Med. Vet. Nouv.-Hebrides, p. 35.

No available material. Rageau & Vervent (1958) recorded this species from Espiritu Santo and Efate.

Length: 5.0–7.5 mm.

*Bionomics.* Adults were recorded to occur from May to July in Vanuatu (Rageau & Vervent 1958).

*Distribution.* Vanuatu (Espiritu Santo, Efate: Rageau & Vervent 1958), Indo-Australian region, from the Indian Ocean islands through to Australia (Northern Territory, Queensland) and into the Pacific as far as Hawaii and the Afrotropical Region (Dear 1977).

### **Stomorhina xanthogaster** (Wiedemann)

*Idia xanthogaster* Wiedemann, 1820, Nova Dipt. Gen.: 21.
*Stomorhina xanthogaster:* Dear, 1977, Aust. J. Zool. **25:** 808.

No available material. Dear (1977) recorded this species from Vanuatu.

Length: 9.5–11.0 mm.

*Bionomics.* Unknown.

*Distribution.* Loyalty Is and New Caledonia (Kurahashi & Fauran 1980), and Oriental and Australasian regions from Nepal to Vanuatu and Australia (Northern Territory, Queensland: Dear 1977).

**Stomorhina discolor** (Fabricius)

*Musca discolor* Fabricius, 1794, Entomol. Syst. **4:** 320.
*Stomorhina discolor:* Rageau & Vervent, 1958, Arthropodes Inter. Med. Vet. Nouv.-Hebrides, p. 35.

Length: 5.5–7.0 mm.

*Specimens examined.* EFATE: 34♂,7♀, 10 km NW of Vila, 12–14.II.1978 (Shinonaga & Shima) (TMDU). ESPIRITU SANTO: 4♂, 25 km NW of Rougainville, 8–11.II.1978 (Shima) (TMDU).

*Bionomics.* Larvae are predacious (Kurahashi & Fauran 1980).

*Distribution.* Widely distributed in the Oriental, Australasian and Pacific regions, from Sri Lanka to the Marquesas Is and Australia (Queensland and New South Wales: Dear 1977).

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