

NEW SPECIES AND OTHER RECORDS OF OTITIDAE (ORTALIDAE), PIOPHILIDAE, CLUSIIDAE, CHLOROPIDAE, AND DROSOPHILIDAE FROM THE MARQUESAS \*

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INTRODUCTION

I have in my possession a rather large collection of certain families of Diptera taken in the Marquesas Islands by the staff of the Pacific Entomological Survey. Unfortunately, lack of time available to make an exhaustive study of them has prevented me from doing much more than to make a cursory survey, though I have already reported upon certain small groups in the survey series of publications.<sup>56</sup> Herein I merely make a partial report on some species that appear to be of importance in connection with problems of geographic distribution or that are of interest from other points of view.

FAMILY OTITIDAE (ORTALIDAE OF AUTHORS)

Genus SCHOLASTES Loew

Of the six species listed by Hendel,<sup>57</sup> only one is among this material.

**Scholastes lonchifera** Hendel.

*Scholastes lonchifera* Hendel: Abh. K. K. Zool.-Bot. Gesell. Wien, vol. 8, no. 1, p. 253, 1914.

This species is much darker than the more common and widely distributed *cinctus* Guérin, being shining black, with the abdomen distinctly metallic blue, the pale thoracic markings yellowish white, and the wing markings black. The frons is longer than wide, with the usual three transverse yellow stripes, the face is yellowish white, with a transverse median black band, and both sexes have a preapical elongate lozenge-shaped widened part on the arista.

Hivaoa: Atuona Valley, altitude 100 feet, February 25, 1929, Mumford and Adamson.

Fatuhiva: Tevaitapu Valley, altitude 650 feet, August 23, 1930; Omoa [Oomoa] Valley, Punahitahi, altitude 650 feet, August 18, 1930, LeBronnec.

Uahuka: Vaipae Valley, September 20, 1929, Adamson.

Uapou: Hakahetau Valley, altitude 1,000 to 2,000 feet, January 31, 1930, and Papaika, altitude 1,000 feet, 1929, R. R. Whitten.

<sup>56</sup> Marquesan Insects I, B. P. Bishop Mus., Bull. 98, Pacific Ent. Survey Pub. I, arts. 1, 2, 11, 14, 1932.

<sup>57</sup> Hendel, Friedrich, Platystominae: Abh. K. K. Zool.-Bot. Gesell. Wien, vol. 8, no. 1, 1914.

\* Pacific Entomological Survey Publication I, article 22. Issued December 9, 1932.

Adamson has also collected a number of specimens from Tahiti, Society Islands.

The species was originally described from a male, type locality, Cook Islands, and I have already recorded it from the Society Islands.<sup>58</sup>

#### Genus PSEUDORICHARDIA Hendel

This genus is readily distinguished by its blue-black color and the very much thickened hind femora, which have two series of short stout bristles on most of the extent of their ventral surface between which series lie the hind tibiae when at rest.

#### *Pseudorichardia flavitarsis* (Macquart).

*Richardia flavitarsis* Macquart: Dipt. Exot., suppl. 5, p. 121, 1850.

*Richardia angulata* Thomson: Freg. Eugen. Res., Dipt., p. 576, 1868.

This is the genotype. Only one other species is known, *aristalis* Bezzi, which was recently described from Fiji. *P. aristalis* may be known from *flavitarsis* by the lack of the large discal black spot on the wing, and the wholly yellow legs. Bezzi described a variety *interrupta* from Fiji in which the large black mark on the center of the wings in typical *flavitarsis* is reduced to a stripe over the base of the discal cell extending to the stigma, and a small isolated dark cloud over the inner cross vein. A teneral example from Society Islands which I have before me and another which I have recorded from Samoa closely approach this form, but I believe that immaturity with consequent lack of pigmentation is the cause of the variation and that the varietal name is unnecessary.

Hivaoa: ridge northwest of Taaoa, altitude 2,800 feet, June 3, 1929, Mumford and Adamson.

A series of specimens in collection from Tahiti, Society Islands.

#### Genus ACROSTICTA Loew

This genus as I accept it is distinguished from *Euxesta* Loew mainly by the pitted or rugose frons.

#### *Acrosticta apicalis* (Williston).

*Euxesta apicalis* Williston: Ent. Soc. London, Trans., pt. 3, p. 375, 1896.

Hivaoa: Hanaheka [Tanaeka] Valley, altitude 1,450 feet, June 4, 1929, Mumford and Adamson.

Fatuhiva: Uia [Ouia] Valley, near sea level, September 1, 1930, Le-Bronnec.

<sup>58</sup> Malloch, J. R., Exotic Muscaridae (Diptera), 26; Ann. Mag. Nat. Hist., 10th ser., vol. 4, p. 99, 1929.



antennae except upper margin of third segment and the arista, and the entire palpi, orange yellow. Frons at vertex distinctly narrower than its length in center and over one-third of the head width, the orbits differentiated above from the interfrontalia by a slight gloss, all four verticals, the postverticals, and ocellars, long, the inner verticals very slightly proximad of the line of the outer pair; each orbit with two quite long upper reclinate bristles and anterior to these, three or more inner marginal bristles which are slightly shorter, the anterior one on each side usually incurved, the interfrontalia with numerous setulose hairs, sometimes with two in front much longer than the others and incurved, the hairing, however, rather irregular. Face in profile slightly produced at epistome, shallowly concave just above it but with a distinct fovea on each side so that the central line is raised in a narrowly rounded carina that becomes flattened above between the antennae; genae about as high as the width of the third antennal segment, with a series of marginal setae; third antennal segment longer than wide, rounded at apex; arista subnude.

Thorax black, with a slight bluish to bronzy luster. Mesonotum with two pairs of postsutural dorsocentrals, the posterior pair longest, and some setulae in front of the anterior pair, the intradorsocentral hairs in about six irregular series, prescutellar acrostichals well developed, sternopleura with one distinct bristle and some long bristly hairs, mesopleura with at least one hind marginal bristle, propleura with the central armature and the pair of lower bristles about the same length and strength, straight. Scutellum with four subequal bristles.

Legs bluish or greenish black, the tibiae brown, paler basally, and the tarsi testaceous yellow, darkened at apices. Fore femur with a series of posteroventral bristles which are very short basally and become long before apex.

Wings greyish hyaline, with dark brown markings and venation as shown in figure 48, the spur vein usually curved.

Halteres yellow.

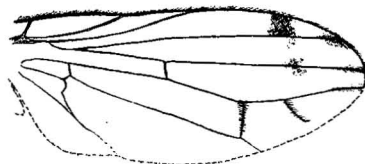


FIGURE 48. *Perissoneura diversipennis*, wing of male.

#### Female

Length, 3.5 to 4 mm. Differs from the male in having the wings entirely without dark markings and in very exceptional cases only with a trace of the spur vein, the tibiae and tarsi preponderantly testaceous, and the size greater.

Fatuuku: altitude 860 feet, September 19, 1930, type, male, allotype and many paratypes, H. Tauraa.

Hatutu [Hatutaa]: altitude 800 feet, April 28, 1931, a number of specimens of both sexes in a vial of alcohol, LeBrons and H. Tauraa.

#### Genus EUXESTA Loew

In my report on the Ortalidae in the "Insects of Samoa" in 1930 I did not distinguish from the present genus the species upon which Hendel based the genus *Pseudeuxesta* and consequently redescribed the genotype of

the latter as *Euxesta semifasciata*, new species. To the extent that I failed to identify Osten Sacken's species I failed admittedly, but in failing to distinguish the two concepts I did not err, and in the collection now before me I find a species that connects the Oriental and New World species so completely that I am compelled to propose the synonymizing of *Pseudeuxesta* with *Euxesta*. Mere geographic distribution can not be made the criterion for the generic separation of Oriental from New World forms, and here we have little else upon which to base the separation.

I had, with only the typical American species of *Euxesta* and the genotype of *Pseudeuxesta* in hand, some doubt as to the propriety of absolutely refusing to recognize *Pseudeuxesta*, but the new species described below caused me to decide definitely to take this course. In the comparison of the genotypes I was struck by the much higher genae of the Oriental form than of the American, in the Oriental form as high as or higher than the length of the entire antenna, whereas in true *Euxesta* species the genae are very much narrower, never greater than the length of the third antennal segment alone. In addition to this distinction, the frons in *Euxesta* in the strict sense has the hairs and bristles much stronger; those along the inner margins of the orbits are about as long as the longer of the upper reclinate orbitals in some species, though they vary somewhat in the genus. In *Pseudeuxesta* the frons is much shorter and somewhat more densely haired, with usually but one distinct upper reclinate orbital and no well-developed inner marginal bristles anteriorly. Apart from these characters and the more regularly forwardly inclined apical section of the fourth vein, I can find no distinctions of moment. It is therefore interesting to discover in the Marquesan material a form, represented by many specimens, that agrees in wing venation with the Oriental form, and in the frontal characters, and almost equally in those of the genae, with the American forms. This I deal with below.

***Euxesta hyalipennis*, new species.**

Male

Head red to brownish yellow, the face quite densely grey dusted, occiput shining bluish black, the vertex, ocellar triangle and upper third of the orbits colored as occiput but usually with a more distinct blue or violet tinge. Antennae brownish testaceous; genae black below, red above; palpi brownish to yellow testaceous. Frons at vertex a little more than one-fourth of the head width, slightly grey dusted on the dark parts, widened gradually to anterior margin, only the upper orbits differentiated in ground color, the extreme lateral edges proximad of these faintly yellowish grey dusted. All vertical bristles strong, the inner pair situated well behind the postocellar line and slightly proximad of the posterior verticals, the postverticals farther from posterior ocelli than the latter are from anterior ocellus; each orbit with two short but distinct reclinate bristles on the upper third, a few very much shorter setulae in front that are not reclinate, and the interfrontalia with scattered black setulose hairs which become longer and incurved anteriorly; length of frons about twice as great as its width at center. Genae about as high as width of third antennal segment. Face black below

the grey dust. Aristae subnude; third antennal segment about 1.25 times as long as its greatest width, broadly rounded at apex.

Thorax shining black, with a greenish or bluish tinge, usually more violet or purple near sides, the mesonotum with regular greyish pruinescence which does not very perceptibly obscure the ground color. The presutural bristle lacking as usual in this genus and its closest allies; dorsocentrals two pairs, the intradorsocentral hairs in six irregular series, rarely as many as eight, close to suture; prescutellar pair of acrostichals strong; scutellars consisting of four subequal bristles; propleural merely a fine hair, the central propleural hairs also very fine.

Abdomen colored as thorax, slightly brownish basally and sometimes on the sides; fourth visible tergite tapered to apex, not noticeably longer than third.

Legs bluish black, yellow at apices of fore coxae and all femora, bases of all tibiae, the basal segment of fore and basal two or three segments of mid and hind tarsi. Fore femur with a series of moderately strong posteroventral bristles.

Wings yellowish hyaline, veins pale brown; venation almost as in *prima* Osten Sacken, except that the first vein enters the costa farther from the apex of the subcosta; first posterior cell gradually narrowed to apex.

Halteres reddish or yellowish.

#### Female

Length, 2.5 to 4 mm. Similar to the male in all respects, but the mid and hind tarsi more extensively yellow. Fourth visible abdominal tergite distinctly shorter than third.

Hatutu [Hatutaa]: type, male, allotype, and paratypes, more than 70; the type, allotype, and several paratypes taken near nests of *Fregata minor*, altitude 800 feet, others at altitude 1,080 feet, near center of island, September 30, 1929, Adamson.

#### **Euxesta pruinosa**, new species.

#### Male

Very similar to the preceding species, differing in color in having the frons brighter, orange-red, the entire lateral margins of this and the vertex, ocellar triangle, upper edge of occiput, and the postocular orbits, densely grey dusted, the mesonotum also densely grey dusted so that the green ground color does not show as clearly as in *hyalipennis*, the abdomen aeneous, with much less distinct dust than the mesonotum, and the mid and hind tibiae testaceous yellow, only the fore pair extensively black, and the hind pair rather faintly browned.

Frons at vertex about one-fourth of the head width, not widened in front as in the preceding species but parallel-sided, the bristling and hairing much the same, but the two pairs of upper orbitals are stronger and longer, the posterior one is a little in front of a line drawn across the anterior ocellus, and the anterior one is much farther in front of the posterior one than in *hyalipennis*, the distance being greater than that from the posterior bristle to the anterior ocellus while in the other it is distinctly less; genae a little higher than in *hyalipennis*.

Thorax differing, apart from the color, in having the intradorsocentral setulae in four rather irregular series close to suture.

Fore femur with the posteroventral surface with several series of quite long dense bristly hairs, most conspicuous basally, and apically with a few distinct bristles; mid tibia with a series of very short fine erect hairs on the entire extent to the anterodorsal surface which are not distinguishable in *hyalipennis*.

Wings as in the preceding species, but the veins more yellow at base.

## Female

Length, 4 to 5 mm. Similar to the male, the fore femora not as densely haired below and the fine erect mid-tibial hairs less evident.

Hivaoa: Tahauku, sea shore, July 10, 1929, type, male, Mumford and Adamson.

Mohotani: seashore, January 31, 1931, paratypes in poor condition, 1 male and 4 females, LeBrons and H. Tauraa.

Eiao: Vaituha, October 2, 1929, at light, allotype and 1 female paratype, Adamson.

The numerous fine and bristly hairs on the ventral surface of the fore femora in both sexes readily distinguish the species from *hyalipennis*, which has in both sexes a single series of well-developed bristles on the entire extent of the posteroventral surface of the fore femora.

## Genus HETERODOXA, new genus

This genus as I propose to accept it is, according to tenets laid down in many related families, quite heterogeneous, but I am inclined to consider that despite the varied characters of the constituent species they have all been derived from one common form and that by distinguishing them as other than merely species I should be doing violence to my principle of attempting to coordinate related forms on the basis of the facts disclosed in the particular region under examination rather than upon facts pertaining to the fauna of other regions. The degree of hairing of the first and third wing veins is a character that has been applied to the purpose of generic separations in most families of Diptera with a large degree of success, but not infrequently the too rigid application of a rule, such for example as the existence or nonexistence of setulae on the base of the third vein, will be found to result in the separation in some examples of the sexes of one species or, in others, in the separation of different specimens of the same species into two different genera. Having this in mind, I have handled the present material conservatively, and, I believe, in accordance with the best interests of our study, retaining the varied forms in one genus.

I would here point out that I consider the name proposed to be sufficiently distinct from *Heterodoxus* Le Souef and Bullen to entitle me to use it here despite the opinion of some of my contemporaries.

The position of the genus in the classification would evidently be in the subfamily Pterocallinae because of the setulose first vein of the wing, the rounded apex of the third antennal segment, the general dull color, and nonconvergent apices of the ultimate sections of the third and fourth wing veins. The genus runs down fairly well to *Callopietromyia* in Hendel's key to the genera of this group,<sup>59</sup> but the head is very different in structure,

<sup>59</sup> Hendel, Friedrich, Pterocallinae: Genera Insectorum, fasc. 96, p. 6, 1909.

with the height equal to, or exceeding, the width instead of much greater than the width, and the frons either parallel-sided or slightly widened in front instead of distinctly wider behind. In the wing venation there are also some distinctions, but I consider these of less importance than the cephalic characters. For other characters see the description below. The species before me may be distinguished as in the appended key. Genotype, *Heterodoxa uapouae*, new species.

#### Key to the Species

1. First wing vein setulose on its upper surface from close to the humeral cross vein to the apex, the markings as in figure 49, *a*.....1. **uapouae**  
First wing vein setulose on its upper surface only on the section from below, or very slightly proximad of, apex of the subcosta to its tip..... 2
2. Inner cross vein distinctly proximad of the middle of the discal cell, markings as in figure 49, *b*; scutellum testaceous yellow, with a central blue mark.....2. **hivaoae**  
Inner cross vein at or very close to the middle of the discal cell; scutellum without a central blue mark..... 3
3. Second visible tergite of abdomen velvety black; markings of wings as in figure 49, *c*.....2. **uahukae**  
Second visible tergite of abdomen testaceous yellow, with three dark brown vittae, one in center and one at each lateral dorsal curve; markings in wings as in figure 49, *d*.....4. **fatuhivae**

#### 1. *Heterodoxa uapouae*, new species (fig. 49, *a*).

General color brownish yellow, nowhere distinctly shining. Head with the ocellar spot fuscous, upper half of occiput with a dark brown line on each side of the central part from which the brown color is carried outward less intensively to almost the lateral edges; frontal orbits, lunule, face, and postocular orbits grey dusted; third antennal segment browned below. Frons at vertex about one-third of the head width and less than one-half as wide as its length in center, parallel-sided, all vertical, the ocellar, postvertical, and orbital bristles long, the anterior pair of orbitals distinctly shorter than the posterior pair and situated about midway from posterior ocelli to anterior extremity, the orbitals distinct on the entire extent, as far as the grey dust is concerned, but the true orbits apparently ceasing at the upper bristle, the anterior one not situated on the grey dusted stripe but mesad of it; interfrontalia with numerous rather long setulose hairs, longer in front, curved over the central line. Face slightly concave in center in profile, without any definite antennal foveae; genae well defined, the entire jowl about as high as width of third antennal segment, the lower edge of genae with a series of quite long bristly hairs. Antennae not elongated, third segment broadly rounded at apex, and about 1.5 times as long as wide; aristae bare; palpi normal.

Thorax with greyish dust, the mesonotum with three broad and two linear brown vittae, all poorly defined, the linear pair along the bases of the dorsocentral series and somewhat punctiform, the larger bristles each with a distinct brown dot at base; pleura varied with dark brown. Two pairs of well developed postsutural dorsocentrals and one pair of presutellar acrostichals present. Scutellum without distinct dark marks, the four bristles long. Sternopleura and mesopleura each with one strong bristle and numerous hairs; propleural hair-like; prosternum bare.

Abdomen with some small dark brown spots, a partial central vitta, and the apices of the tergites with a fascia of the same color.

Legs unicolorous tawny yellow. Fore femur with a series of posteroventral bristles;



mid femur with two apical posterior bristles; hind femur with two preapical dorsal bristles.

Wing marked with dark brown as in figure 49, *a*; first vein setulose on upper side from near humeral cross vein to apex, bare below; third vein bare.

#### Female

Length, 5 mm. Similar to the male in all respects except the genitalia.

Uapou: Hakahetau Valley, altitude 1,000 to 2,000 feet, January 1, 1930, type, male, and allotype, R. R. Whitten.

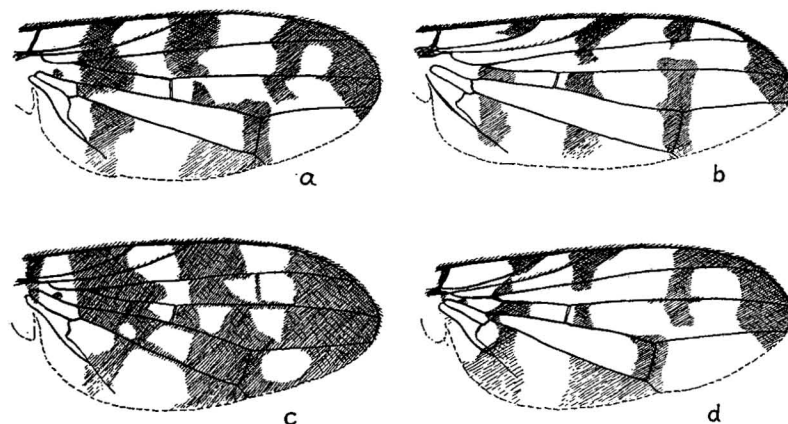


FIGURE 49. Wings of *Heterodoxa* species: *a*, *H. uapouae*; *b*, *H. hivaoae*; *c*, *H. uahukae*; *d*, *H. faihivae*.

#### 2. *Heterodoxa hivaoae*, new species (fig. 49, *b*).

#### Male

Length, 5 mm. General color brownish yellow, as in the preceding species, but the thorax, and more especially the abdomen, more distinctly shining.

Head in addition to the black ocellar spot with a shining brownish black spot connected with it and behind the posterior ocelli. Structurally similar to the preceding species, but the anterior orbital not as far forward. Antennae both lacking except the basal two segments; these are yellow.

Mesonotum with grey dust and three broad though poorly defined fuscous vittae, the central one continued over the disc of the scutellum where it becomes distinctly blue in tone; pleura with two fuscous vittae, one near upper margin, the other on the upper part of sternopleura. Bristling as in the preceding species, the presutural not present.

Abdomen almost glossy, somewhat greasy so that the markings are obscured, but in the main similar to the preceding species though the first two visible tergites are more preponderantly blackened and the remainder less so.

Legs entirely tawny yellow, armed as in the preceding species.

Wings narrower than in the other species, when seen from the tip against the light distinctly yellow except in the anterior basal cell between the inner cross vein and the dark mark basad of it, in the first posterior cell, the apical section of the submarginal cell, and in the second posterior cell, which are whitish hyaline; the markings shown in figure 49, *b*, dark brown. The inner cross vein is distinctly before the

middle of the discal cell; to which character I do not attach the same importance as does Hendel in his classification of the subfamily, referred to above.

Hivaoa: Mount Temetiu, altitude 2,500 feet, July 24, 1929, type, miscellaneous sweeping, Mumford and Adamson.

### 3. *Heterodoxa uahukae*, new species (fig. 49, *c*).

#### Female

This species is of the same general color as the preceding two, but has the second abdominal tergite velvety black or brownish black, the brown mesonotal vittae all interrupted, the scutellum irregularly brown at base, and the wings marked as in figure 49, *c*.

Head with the ocellar spot fuscous, and the genae brown above, otherwise orange yellow, the third antennal segments missing in type; back of head slightly dark in center as the other species. All frontal bristles rubbed off, but from the size of the insertion scars they appear to be rather large, the anterior pair of orbitals about midway from the posterior ocelli to anterior margin.

Mesonotum with the central vitta extending from anterior margin to the suture at which latter point it is dilated, and at the bases of the presutural acrostichals it is again present in the form of two spots at bases of the bristles, the sublateral vittae broken into three parts, one on anterior margin, a second at the suture, and a third on the postalar convexity; pleura largely blackish brown; scutellum with a rather variable dark brown basal mark. Chaetotaxy as in the two preceding species.

Abdomen entirely dull, the basal two tergites dark, the others tawny yellow and with rather irregular velvety brown markings. Sheath of ovipositor black, yellowish at base.

Legs tawny yellow, femora darkest, the armature as in the genotype.

Wings more extensively blackened than in any of the others, the inner cross vein close to middle of the discal cell (fig. 49, *c*).

Halteres yellow.

Uahuka: Hitikau Ridge, altitude 2,900 feet, March 4, 1931, type, Le-Bronnec and H. Tauraa.

### 4. *Heterodoxa fatuhivae*, new species (fig. 49, *d*).

#### Female

Like the other species, this one is tawny yellow, though the type specimen is teneral, whence it is difficult to describe the exact color and markings. The mesonotum has much more distinct and complete dark brown vittae than the next preceding species, the abdomen has less extensive dark markings than in the latter, and the wings are marked as in figure 49, *d*.

Head with the same dark marks as in the next preceding species, but the occiput more extensively dark brown. The two pairs of orbital bristles are much closer than in the last species, the anterior pair about half as far from the posterior ocelli as they are from the anterior margin. Third antennal segments missing.

Thorax dull tawny yellow, with yellowish grey dust. Mesonotum damaged by the pin so that it is impossible to be sure whether the central vitta is present anteriorly, but there is a pale brown trace of it on the presutural area, as there is also on the disc of the scutellum; the sublateral vittae are quite conspicuous, dark brown, narrowly interrupted and angulate at the suture; pleura with a rather faint brown upper vitta and a similar central one over the upper part of the sternopleura. Chaetotaxy normal, the prescutellar acrostichals strong.

Abdomen tawny yellow, with a dark brown central vitta and apices of the same color to most of the tergites, the sheath of the ovipositer tawny yellow.

Legs tawny yellow, apices of the tarsi browned.

Wings with the markings as in figure 49, *d*, the inner cross vein white, as in the other species, and close to the middle of the discal cell.

Halteres yellow.

Fatuhiva: Teavaipuhiau, altitude 2,150 feet, August 25, 1930, sweeping over *Paspalum conjugatum*, type, LeBronnec.

Because of the general condition of the type specimen, the markings of the wings shown in figure 49, *d*, may not prove to be accurate for mature specimens. In mature examples the wing markings are generally more extensive.

#### FAMILY PIOPHILIDAE

##### Genus PIOPHILA Fallen

The members of this genus are, as far as is known, scavengers, feeding in decaying animal matter. Several of them are of almost world-wide distribution.

##### **Piophila casei** (Linné).

Eiao: Vaituha, near sea level, October 1, 1929, Adamson.

This is the most generally distributed and common species of the family. Its frequent occurrence in preserved meats and cheese is largely responsible for its distribution from New Zealand northward to Siberia in the Old World, and from Patagonia to arctic Canada in the New World.

#### FAMILY CLUSIIDAE

##### Genus TONNOIRIA Malloch

This genus was erected for the reception of a Society Islands species. I have before me a series of specimens dealt with below, and have also representatives from Guam.

##### **Tonnoiria palliseta** Malloch.

Hivaoa: Teava Uhia i te Kohu, above Puamau, on *Hibiscus tiliaceus*, Mumford and Adamson.

One female without head belongs here and agrees with a number taken on Tahiti, Society Islands, altitude 1,500 feet, by A. M. Adamson.

The larvae undoubtedly live in dead wood, but nothing is as yet known of the life history of this genus.

The Guam species is distinct from the present one, and apparently undescribed.

## FAMILY CHLOROPIDAE

## Genus PROHIPPELATES Malloch

**Prohippelates pallidus** (Loew).

Hatutu [Hatutaa], 1,010 feet; Uahuka 880 feet; Fatuhiva, 50 feet; Hivaoa, 2,500 feet; Mohotani, on seashore, 975 feet and 1,000 feet.

A number of specimens from Tahiti, Society Islands, 1,500 feet, were taken by A. M. Adamson.

This species is very widely distributed in tropical regions from the West Indies to the Hawaiian islands, the Seychelles, and Samoa.

Of the many specimens in the collection, the greatest number belongs to the typical form with entirely yellow thorax and antennae, but others show the two dark mesonotal vittae that distinguish form *bilineatus* de Meijere, and in a number of specimens the antennae are black, which latter may be accepted as *nigricornis* Thomson, considered as merely another variation.

The species has been reared from larvae feeding in dead shellfish.

## Genus CADREMA Walker

This genus, generally accepted as *Hippelates* Loew, is represented by one species in the Marquesas Islands, but at present I have not determined it specifically.

In North America certain species are known as eye-flies and are very annoying in summer by flying around people and getting into the eyes and nostrils, especially during hot humid weather. They are suspected of being carriers of certain eye diseases, and an intensive investigation of their life-histories is being made in North America by the United States Bureau of Entomology.

I have seen one species from New Zealand and several from Australia.

## Genus MICRONEURUM Becker

This genus is readily known by the very short second wing vein, the tip of this ending in the costa at less distance from first than the latter is from the humeral cross vein. I have seen one Australian species. The others come mainly from the tropical sections of the Old World.

**Microneurum signatum** Wollaston.

Teuaua Islet, off Uahuka, September 21, 1929, 25 specimens, Adamson. This species is distributed from the Madeira Islands to Formosa.

## Genus OSCINOSOMA Lioy

This is the most widely distributed genus of the subfamily Oscinosominae. At this time I present the description of one new species which might

with some plausibility be placed in *Gaurax* Loew, but the latter is a very poorly defined group, about the only character for its distinction from *Oscinosoma* being the more distinctly haired aristae.

***Oscinosoma uahukae*, new species.**

Female

Length, 3 mm. Head yellow, triangle and upper two-thirds of back of head glossy black; antennae and aristae black; palpi orange-yellow; hairs and bristles on frons dark, the hairs on lower margin of gena yellow. Frontal triangle extending to or a little beyond middle of frons, the extreme edges and the ocellar spot slightly dusted; length of frons slightly over its width, the vertical bristles well developed, the inner marginal hairs on orbits quite long, and the surface hairs on interfrontalia quite strong; third antennal segment moderately large, somewhat reniform; arista with the longest hairs longer than its basal diameter; gena almost linear.

Thorax glossy black, including the scutellum, the mesonotum with a fairly large triangular yellow mark above the notopleural suture; lower edge of propleura yellowish brown. The usual 1 + 2 notopleurals present; scutellum with two moderately large apical and two much smaller preapical bristles, the disc haired; mesonotum not punctured.

Abdomen black.

Legs yellow, all femora blackened from near, or before, middle to near apices; all tibiae blackened from near base to beyond middle, the fore pair least distinctly so; apical three segments of fore and mid tarsi and apical two segments of hind pair black. Sensory area on hind tibia short but distinct.

Wings hyaline, much damaged in type so that the venation can not be described definitely.

Uahuka: Hitikau Ridge, altitude 2,900 feet, March 4, 1931, on *Weinmannia* species, type, female, LeBronnec and H. Tauraa.

FAMILY DROSOPHILIDAE

There is a very large number of specimens of this family amongst the material in my hands, though the number of species is not particularly large. Most of the species belong to *Drosophila* in the wide sense, but some others belong to genera in which there are comparatively few species. It is impossible to deal with the entire collection at this time, but a few of the most interesting species are covered in this paper.

Genus **DICLADOCHAETA**, new genus

This genus is very similar to *Cladochaeta* Coquillett, differing in having the head more elongate, with the posterior ocelli well in front of the vertex, the postvertical bristles closer together, the proclinate orbital distinctly in front of the very small reclinate one, the main branch of the arista with a very small hair near its apex above, and the mesonotum with but two series of intradorsocentral hairs.

Genotype, *Dicladochaeta biseriata*, new species.

**Dicladochaeta biseriata**, new species.

## Male and Female

Length, 2.5 to 3 mm. Head varying from tawny yellow to orange-yellow, with the frons rather densely whitish grey dusted on each side, the dust extending over the vertex on each side of the ocelli; antennae entirely yellow, ocellar spot, a spot on each side of vertex below the upper level, and sometimes the upper orbits, fuscous below the pale dust; the hairs and bristles and also the arista dark. Frons at vertex about half the head width, becoming slightly narrower to anterior margin, the orbits well differentiated because of the grey dust, narrow above, widened to the proclinate bristle which is situated about two-thirds from the vertex and well away from the eye, and narrowed from that point to anterior margin, at widest point fully half as wide as the interfrontalia at same point. All verticals well developed, postverticals convergent, about as long as the upper reclinate orbitals; ocellars slightly behind level of anterior ocellus and in line with the posterior ocelli and bases of postverticals; anterior reclinate pair mere short hairs; surface hairs very sparse. Face concave in profile, with no well developed vertical central carina, the parafacials hardly visible in side view; gena linear; vibrissa single; antennae normal, third segment about 1.5 times as long as second, rounded at apex, second with two or three short black bristles; arista consisting of a lower ray from which one about equally as long emanates near base, and usually a very short hair near apex on upper side of arista.

Thorax variable in color, sometimes tawny yellow, distinctly shining, and paler ventrally, and sometimes with two rather distinct dorsal brown vittae; the mesonotum usually with evident grey dust. Two pairs of strong dorsocentrals present, the anterior pair a little nearer to the suture than to the posterior pair, presutural bristle well developed, humeral one, intradorsocentral hairs in two regular series, prescutellar acrostichals undeveloped, sternopleurals two, the upper one weak; scutellars four.

Abdomen colored as thorax, rather variable also, but in the material before me generally unmarked.

Legs tawny yellow. Fore femur with a series of widely spaced posteroventral bristles, all tibiae with a fine, moderately long preapical dorsal bristle; claws of all legs quite large and conspicuously curved.

Wings hyaline, veins brownish. Costa with quite noticeable, fine, rather widely spaced erect hairs from apex of first to apex of third vein, and one bristle at the subcostal break. Sixth vein short but distinct, ending about midway to margin of wing. Outer cross vein at fully its own length from apex of fifth vein. Third vein ending in wing tip.

Halteres yellow.

Hivaoa: Matauuna, altitude 3,760 feet, July 24, 1929, type, male, allotype, and 5 paratypes, Mumford and Adamson.

The genus *Cladochaeta* occurs in tropical America only, and though the above genus is compared with it, this course is adopted because it is to the American genus it will run in existing keys to the genera. It is, however, my opinion that the new genus is more closely allied to *Scaptomyza* than to *Cladochaeta*.

Genus **BUNOSTOMA**, new genus

This genus, like the one just described, has but two series of intradorsocentral hairs on the entire extent of the mesonotum, and the prescutellar acrostichals undeveloped, but the arista are numerous rayed above and

furnished with two or more rays below (fig. 50, *a*). In general the genus resembles *Drosophila* Fallen, but the face is very different in form, having a mound-like elevation over its entire width which tapers downward to the epistome, and gradually narrows into a slender interantennal carina above (fig. 50, *b*). The frons is similar to that of typical *Drosophilidae*, and, whereas in *Scaptomyza* Hardy there are but two series of intradorsocentral hairs, the face is not as in the present genus, and the species are much more slender.

Genotype, *Bunostoma flavifacies*, new species.

***Bunostoma flavifacies***, new species (fig. 50, *a, b*).

Male and Female

Length, 2.5 to 3 mm. Shining brownish black, the abdomen deeper black and more glossy than the thorax, the frons and mesonotum with very slight greyish dust, the abdomen without dust.

Head black, face except upper third varying from dull yellow to yellowish brown, second antennal segment sometimes reddish, palpi fuscous. Frons at vertex one-half of the head width, narrowed to anterior margin, its length in center distinctly less than equal to its width at vertex; inner verticals distinctly longer than outer pair, the latter equal to ocellars and upper reclinate orbitals in length; postverticals a little shorter than outer verticals, converging at tips; anterior reclinate orbital very minute, very slightly before the proclinate pair and nearer to eye than these, the proclinate bristles not more than half as long as the upper reclinate pair; orbits distinct to base of proclinate bristle, extending almost to anterior margin, the triangle shining and extending almost to anterior margin also; face yellow to pale brown below, evenly convex between vibrissae (fig. 50, *b*); profile of head as in figure 50, *a*; palpi with a rather long apical, and some much shorter preapical, setulae.

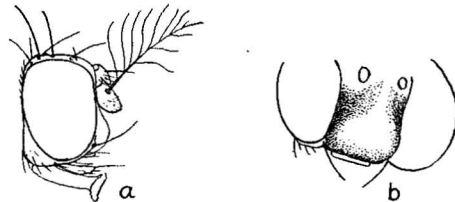


FIGURE 50. *Bunostoma flavifacies*: *a*, head in profile; *b*, face, oblique view.

Thorax shining brownish black, with slight grey or brownish dusting on mesonotum. Bristling as follows: two pairs of long equally widely spaced dorsocentrals, the anterior pair nearer to suture than to posterior pair, one humeral, two notopleurals, one supraalar, one short prealar, two postalars, and one long presutural; intradorsocentral hairs in two series which do not extend entirely to hind margin; scutellum slightly flattened on disc, the apical bristles closer together than they are to the basal pair; sternopleurals two, the upper one short.

Abdomen glossy black. Seventh tergite in male reduced to a mere ring because of the truncate slightly concave apex of the abdomen, the sixth tergite with a series of quite long preapical bristles on each side below the curve. Genital lamellae of female very similar to those of *Scaptomyza incana* Meigen, the general color testaceous yellow, their inferior edges with short stubby bristles.

Legs shining black, extreme apices of femora, both extremities of tibiae, and all of the tarsi testaceous yellow. No exceptional armature present, all tibiae with a fine preapical dorsal bristle.

Wings greyish hyaline, veins brown. Costa with a series of minute rather widely spaced setulae on upper side which do not project forward but upward and are thus seen only when the wing is viewed from hind margin against the light; section of the costa between apices of second and third veins fully twice as long as the one beyond it and a little less than one-third as long as the preceding section; outer cross vein at about 1.5 times its own length from apex of fifth vein; ultimate section of fourth vein fully 1.5 times as long as penultimate section.

Halteres yellow.

Hivaoa: Kopaafaa, altitude 2,770 feet, August 2, 1929, in miscellaneous sweeping, type, male, allotype, and 3 male paratypes; Mount Temetiu, north-east slope, altitude 2,800 feet, September 13, August 3, 24, and 29, 1929, in miscellaneous sweeping, 4 paratypes; Mumford and Adamson.

#### Genus SCAPTOMYZA Hardy

This genus is distinguished from *Drosophila* merely by the less numerous series of intradorsocentral hairs. Recent writers have treated the genus variously. Duda at one time expressed the opinion that it was at most a subgenus of *Drosophila*, and then proposed dividing it into two subgenera. Hendel<sup>60</sup> has still more recently given it full generic status, realigned the type species of Duda's concepts pointing out the errors in Duda's papers, and elevated the two segregates to generic rank. The action taken by Hendel was predicated upon the characters of the bristling and hairing of the thorax, and apparently upon the food habits of the species involved. *Scaptomyza* as restricted by him contains *graminum* Fallen, with two doubtful forms, in which the mesonotum has but two series of intradorsocentral hairs, one strong humeral bristle, the face with a very distinct nose-like elevation, and larvae that occur as a rule in decaying vegetable matter or in fruits, only occasionally mining in leaves. *Scaptomyzella* (*Scaptomyzetta*, *erratum*) includes two species which have the intradorsocentral hairs in four series, two humerals, the face less distinctly elevated centrally, and the larvae true leaf-miners.

Unfortunately the habits of the larvae are not always known to one when specimens are submitted for identification, so this last character can hardly be maintained as of systematic value, particularly as it is not one that can be applied invariably even in the two groups under discussion. We are thus compelled to use only the structures listed above, and to some extent the minor characters of the terminal segments of the abdomen in both sexes mentioned by Hendel. In attempting to apply these to the North American

<sup>60</sup> Hendel, Friedrich, Über die minierenden europaischen Scaptomyza-Arten und ihre Biologie (Diptera): Zool. Anz., vol. 76, p. 289, 1928.



species we find that *adusta* Loew, which has been found in the larval stage mining the leaves of cabbages, does not fit in either, having one strong humeral bristle and four series of intradorsocentral hairs so that it would appear to require either another genus for its reception or the dropping of the new one proposed by Hendel, *Scaptomyzella*. Of the other three North American species known to me, one would fit into *Scaptomyza*, the other into *Scaptomyzella*, Hendel's genus, but the other, *vittata* Coquillett, though falling into *Scaptomyza* on the characters cited above as to thoracic armature, has an additional pair of dorsocentral bristles and assumably might be considered as the basis for a fourth generic concept. My personal opinion is that one genus might well contain all four types and I suggest that *Scaptomyzella* be considered as a synonym of *Scaptomyza*.

In the Marquesas material before me there are a number of specimens referable to the genus, apparently representing three species, all of them with biseriate intradorsocentral hairs and one humeral bristle, and consequently they belong to *Scaptomyza* in the strict sense as defined by Hendel. I describe two of these as new.

***Scaptomyza latifrons*, new species.**

Female

Length, 3 to 3.5 mm. A testaceous yellow species, with the thorax slightly, and the abdomen more distinctly, shining, ocellar spot hardly darkened, abdomen with a dark lateral mark on apex of each tergite from third to fifth inclusive, a less evident central apical dark mark on the same tergites, usually more noticeable on fifth, and a large fuscous mark on almost the entire dorsal exposure of the sixth. Wings hyaline.

Head entirely yellow. Frons at vertex half of the head width, much narrowed to anterior margin, its length in center about equal to its anterior width, the orbits slightly differentiated and with very faint grey dust, practically uniform in width on their entire length, the triangle poorly defined. Vertical bristles well developed; upper reclinate orbital a little below middle of frons and fully three times as far from vertical as from the proclinate bristle, the anterior reclinate bristle very short and fine, situated slightly laterad and in front of the proclinate one; postverticals situated below vertex and separated by a distance about 1.5 times as great as that across the posterior ocelli. Face much as shown in the figure of that of the next preceding genus, but the carina not as gradually rounded off below, though the nose-like form found in *graminum* Fabricius is quite different. Arista with 7 rays above and 2 long rays below, as compared with the normal 5 above and 1 below in *graminum*. Palpus with a moderately long terminal bristle. Gena not over one-fourteenth of the eye height; marginal hairs moderately long; vibrissa single.

Thorax with the same bristles and hairs as in the genotype, the two pairs of dorsocentrals equally strong, widely separated, and the prealar short but distinct; scutellum with four subequal marginal bristles; sternopleura with one long and one much shorter and finer upper bristle.

Abdomen normal, the apical dorsal process broadly rounded at apex, with numerous fine hairs, two at apex longer than the others; genital lamellae typical of the genus, with numerous small black points on the margin apically.

Legs normal, fore femur with the posteroventral bristles less numerous than in *graminum*, only three on apical half well developed.

Wings rather slender, third vein terminating in tip, the section of the costa beyond it about half as long as the one immediately before it.

Halteres yellow.

Hivaoa: Kopaafaa, altitude 2,770 feet, August 2, 1929, in miscellaneous sweepings, type and 3 paratypes, Mumford and Adamson.

It appears worth noting that the eyes are quite distinctly haired and have a much more marked emargination of the lower posterior border than in the North American species.

**Scaptomyza biseta**, new species.

Male

Length, 2 mm. A paler species than the one described above, without dark abdominal markings, but the type is rather greasy and it is difficult to determine the true condition.

Differs from *latifrons* in having the head longer, in profile about 1.25 times as long as high, instead of about as high as long, the gena about one-sixth of the eye height, the eyes more distinctly emarginate on lower posterior border, the frons a little less than half the head width and distinctly longer than its anterior width, with the two long orbitals more widely spaced, and the postverticals closer. The outstanding distinction is found in the antennal arista which has only two long upper and no lower rays.

Thorax and abdomen much as in the preceding species.

Fore femur with much weaker posteroventral bristles than in *latifrons*.

Hivaoa: Matauuna, altitude 3,700 feet, March 4, 1930, miscellaneous beating, type, Mumford and Adamson.

**Scaptomyza** species.

One specimen which is very close to, if not identical with *australis* Malloch. The back of the head is yellow in the center behind the ocelli and black on each side. The eyes are less noticeably emarginate than in the two preceding species. I hope to obtain more material to determine whether this Australian species occurs in the Marquesas.

Hivaoa: Tahauku, July 10, 1929, Mumford and Adamson.

Genus **MARQUESIA**, new genus

This genus is very similar to *Drosophila* Fallen, but differs in having the mesonotum with four pairs of well developed dorsocentral bristles, the anterior pair in front of, the second pair at, the suture. The head is similar to that of *Drosophila*, but the lower margin of the gena is quite densely haired, the mesonotum has about six irregular series of intradorsocentral hairs, and the sixth wing vein is very thick and incomplete, attaining a length of more than half that to the wing margin. For other characters see description of the genotype.

Genotype, *Marquesia major*, new species.

**Marquesia major**, new species.

## Male

Length, 6.5 mm. A large stout testaceous yellow species with conspicuous dark brown markings, the abdomen mainly of the latter color, with a conspicuous yellow, grey dusted spot on each side of the apex of each tergite. Wings pale brownish, darker at base and narrowly so on outer cross vein.

Head testaceous, dull, with greyish dust on the pale parts, the frons dark brown except on angles of the triangle and narrowly along the outer edge of each orbit, face with an irregular dark brown transverse stripe below middle; back of head with a large irregular dark brown mark on each side behind lower half of eye but not attaining the margins of eyes. Antennae brown, third segment almost black, the arista black; palpi fuscous. Frons at vertex about half of head width, with a very noticeable depression on each side of the posterior ocelli, all the vertical bristles long, the postvertical pair about as long as the ocellars, length of frons at center equal to its width at posterior ocelli, the sides convergent slightly in front; orbitals rubbed off but almost in longitudinal line, the smallest one well developed. Eyes narrowed below, the posterior margin appearing transverse from above middle to lower margin, the hairs dense, short, and erect; gena almost linear, with dense biseriate setulose lower marginal hairs which run up to the strong vibrissa, and adjacent to the vibrissa two or three slightly shorter bristles; face with very well developed central vertical carina that is readily seen in profile, and a transverse deeply impressed line about midway from apex of third antennal segment to epistome. Arista with about nine upper rays and two lower. Palpi slightly club-shaped, downy, with one fine apical bristle.

Thorax testaceous yellow, with greyish dust on the pale parts, mesonotum with five broad dark brown vittae, pleura with the surface so broadly dark brown that only a vitta from propleura over middle of mesopleura and a narrow line below that on level of upper margin of the sternopleura remain yellow; scutellum slightly yellow at tip; postnotum brown on sides. Dorsocentrals 1 + 3, prescutellar acrostichals undeveloped; sternopleura with one long lower and two short upper bristles; scutellum with disc flattened, the margin slightly angulate at base of each bristle.

Abdomen dark brown, dull, with a conspicuous yellow, grey dusted spot on each side of apex of all tergites on dorsal exposure, some of the pairs connected, and no pale ventral markings. Hypopygium small, the forceps consisting of opposed rounded lobes that are rather densely haired, and the penis (?) of a slender chitinous downwardly directed blunt tipped process.

Legs dark brown, bases of tibiae and of tarsi testaceous yellow. Fore femora with a rather irregular series of posteroventral bristles; all tibiae with a preapical dorsal bristle.

Wings brownish hyaline, darker at bases, the outer cross vein with a narrow dark cloud. Third vein ending in apex, the section of costa beyond the vein about two-thirds as long as the preceding section; outer cross vein at about its own length from apex of fifth vein; penultimate section of fourth vein hardly shorter than ultimate section; sixth vein short and thick.

Halteres yellow.

Hivaoa: Matauuna, altitude 3,700 feet, March 2, 1930, type, Mumford and Adamson.

This species reminds one of some of the very large Hawaiian species of the genus *Drosophila*, but I have found none of the latter in which there are four pairs of well developed dorsocentral bristles, all known to me agreeing with typical species of that genus in having two postsutural pairs.