Vol. 105. Part 6. Pp. 97–116. 9 figs. 25th June, 1954

THE

TRANSACTIONS

OF THE

ROYAL ENTOMOLOGICAL SOCIETY

OF

LONDON

World List abbreviation: *Trans. R. ent. Soc. Lond.*

CONTENTS

LONDON:
PUBLISHED BY THE SOCIETY AND
SOLD AT ITS ROOMS, 41, QUEEN'S GATE, S.W. 7

Price 7s. 0d.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

Founded 1833. Incorporated by Royal Charter 1885.

PATRON:

HER MAJESTY THE QUEEN.

OFFICERS AND COUNCIL FOR THE SESSION, 1954–1955.

PROF. P. A. BUXTON, C.M.G., F.R.S. *President.*

DR. N. E. HICKIN
DR. W. J. HALL, C.M.G., M.C.
MR. F. T. VALLINS
} *Vice-Presidents.*

DR. N. E. HICKIN, *Treasurer.*
MR. E. B. BRITTON, *Secretary.*
MR. J. BALFOUR-BROWNE, *Editor.*

Other Members of Council.

DR. C. H. ANDREWES, F.R.S.
MR. R. F. BRETHERTON, C.B.
MISS T. CLAY
MISS R. M. DAVENPORT
DR. G. H. L. DICKER
DR. J. W. EVANS
MR. A. E. GARDNER
MR. W. D. HINCKS
MR. R. W. LLOYD
DR. K. MELLANBY, C.B.E.
PROF. O. W. RICHARDS

MISS E. EVANS, *Registrar.*

Finance and House Committee.

DR. J. W. EVANS (Chairman).

MR. R. F. AVERY
DR. G. H. L. DICKER
MR. PAUL FREEMAN
DR. K. MELLANBY, C.B.E.
PROF. G. C. VARLEY

Publication and Library Committee.

PROF. O. W. RICHARDS (Chairman).

DR. B. M. HOBBY
MR. E. O. PEARSON
MR. J. F. PERKINS
MR. H. L. G. STROYAN
DR. C. B. WILLIAMS, F.R.S.

Nomenclature Committee.

MR. FRANCIS HEMMING, C.M.G., C.B.E. (Chairman).

PROF. W.A.F. BALFOUR-BROWNE, F.R.S.E.
PROF. O. W. RICHARDS
MR. N. D. RILEY, C.B.E. (Secretary).

Committee for the Protection of British Insects.

MR. H. M. EDELSTEN, O.B.E. (Chairman).

MR. R. B. BENSON
MR. R. F. BRETHERTON, C.B.
LIEUT.-COL. C. A. W. DUFFIELD, M.C., J.P.
DR. B. M. HOBBY
CAPT. R. A. JACKSON, C.B.E., R.N.
LIEUT.-COL. W. B. L. MANLEY
DR. A. M. MASSEE, O.B.E.
MR. A. ROEBUCK
MR. N. D. RILEY, C.B.E. (Secretary).

The Executive Officers of the Society are *ex-officio* members of all Committees.

DELEGATES OF THE SOCIETY TO:

1. **British National Committee for Biology** (Royal Society).
   Prof. G. C. Varley, appointed 1952.
   Dr. E. B. Ford, F.R.S., appointed 1949.
2. **Local Committee of Management of Wicken Fen.**
   Mr. H. M. Edelsten, O.B.E. (nominated by Committee for the Protection of British Insects).
3. **National Trust for Places of Historic Interest or Natural Beauty.**
   Mr. H. M. Edelsten, O.B.E., appointed 1944.
4. **New Forest Association.**
   Mr. C. W. Mackworth-Praed, appointed 1948.
5. **New Forest Joint Committee.**
   Lt.-Col. F. C. Fraser, appointed 1949.
6. **Council for the Promotion of Field Studies.**
   Dr. W. H. Thorpe, F.R.S., appointed 1944.
7. **Joint Bioclimatic Committee.**
   Dr. B. P. Uvarov, C.M.G., F.R.S., appointed 1945.
   Dr. C. B. Williams, F.R.S., appointed 1945.
8. **Yorkshire Naturalists' Trust, Ltd.**
   Mr. W. D. Hincks, appointed 1946.
9. **The Biological Council.**
   Dr. N. E. Hickin, appointed 1952.
10. **The Parliamentary and Scientific Committee.**
    Dr. N. E. Hickin, appo ‹1953.

SOME NOTES ON AND ADDITIONS TO THE DROSOPHILIDAE (DIPTERA) OF SAMOA AND FIJI.

By Roy A. Harrison. F.R.E.S.

(*Plant Diseases Division, Department of Scientific and Industrial Research, Auckland, New Zealand.*)

Manuscript received 13th May, 1953.

(Read 4th November, 1953.)

With 9 Text-figures.

Contents.

1. Introduction.

During the period from November 1950 to January 1951, about 1500 flies belonging to the family Drosophilidae were collected in Samoa. From this collection, 764 specimens were mounted for detailed examination. The remainder, which belonged to common species, were examined and preserved unmounted. During this period one specimen was also collected at Suva, Fiji.

An account of the collections is given in this paper.

The sole contribution to our knowledge of the Drosophilidae of Samoa is contained in a paper by Malloch (1934), in which 28 species belonging to ten genera were recorded. Two of these genera, viz. *Hirtodrosophila* Duda and *Spinulophila* Duda, are now included in the genus *Drosophila* Fallén and in this paper a third genus, viz., *Hopkinsomyia* Malloch is reduced to a synonym of *Microdrosophila* Malloch. Two further genera, viz., *Liodrosophila* Duda and *Leucophenga* Mik are recorded here for the first time from Samoa. The total genera of this family known to occur in Samoa therefore remains at ten.

The present collection contained 18 species of the family, ten of which were already known from Samoa. The remaining eight species are new and are described here. With these additions the total number of species of Drosophilidae recorded from Samoa is now thirty-six. One new species was discovered in Fiji and its description is included in this paper because it shows affinities to a Samoan form.

The greater part of the collecting was done on Manono Island. This is a small island within the coral reef and reaches a maximum height of about 200 feet above sea level. Its whole area may be regarded as a typical coastal habitat. Collections were also made at two localities on Upolu, both a few miles from Apia. These were at Vailima (600 ft.) on the lower edge of the rain forest and at Malololelei (2000 ft.). In these two localities collecting was mainly restricted to virgin rain forest well removed from inhabited areas.

As might be expected in a tropical habitat, Drosophilid flies are exceedingly numerous in Samoa. Swarms were always present about fallen fruit and collecting of such flies was easy. Sweeping over foliage and along bush tracks was also productive of many specimens. Traps were seldom used, not because they were inefficient but because it was easier to collect specimens with a net.

An analysis of the mounted collection shows that it is composed of the following:

Drosophila ananassae Doleschall . .	322 specimens.
D. nasuta Lamb	180 ,,
D. bryani Malloch	161 ,,
D. hypopygialis Malloch . . .	72 ,,
All other species	29 ,,

The unmounted portion of the collection consisted entirely of the four named species.

The majority of the specimens were collected by the author. Types of new species are retained in the author's collection.

2. List of Species of Samoan Drosophilidae.

The following is a list of the species of Drosophilidae known to occur in Samoa:

Drosophila seminigra Duda, 1923.
D. unicolor Malloch, 1934.
D. innocua Malloch, 1934.
D. manonoensis sp. n.
D. fuscovittata sp. n.
D. marjoryae sp. n.
D. samoaensis sp. n.
D. excepta Malloch, 1934.
D. bryani Malloch, 1934.
D. melanogaster Meigen, 1830.
D. montium de Meijere, 1916.
D. ananassae Doleschall, 1858.
D. nasuta Lamb, 1914.
D. hypopygialis Malloch, 1934.
D. albifrontata Malloch, 1934.
D. pleurovittata sp. n.
D. convexa Malloch, 1934.
D. nigrifrons Malloch, 1934.
D. upoluae Malloch, 1934.
Leucophenga samoaensis sp. n.
Liodrosophila flavipes sp. n.
Lissocephala versicolor Malloch, 1934.
L. pallidipennis sp. n.
Microdrosophila convergens (Malloch), 1934.
Mycodrosophila nigrithorax Malloch, 1934.
M. buxtoni Malloch, 1934.
M. gratiosa (de Meijere), 1916.
Scaptomyza stamineipes Malloch, 1934.
S. bicolor Malloch, 1934.
Upolumyia pictifrons Malloch, 1934.
U. bimaculata Malloch, 1934.
Samoaia comma Malloch, 1934.
S. hirta Malloch, 1934.
S. nuda Malloch, 1934.
S. ocellaris Malloch, 1934.
Zygothrica samoaensis Malloch, 1934.

The following species is an addition to the Fijian fauna: *Lissocephala fijiensis* sp. n.

3. Key to Genera of Samoan Drosophilidae

The key given by Malloch (1934) remains satisfactory except for the absence of *Leucophenga*, but a more up to date and comprehensive key has been compiled for the Pacific region, (Wheeler 1952).

The following key is based on Wheeler's key (loc. cit.) but is restricted to Samoan genera.

1. Mesonotum with three pairs of strong dorsocentrals, anterior pair close to suture . . . . . **Samoaia** Malloch.
   Mesonotum with one or two pairs of strong dorsocentrals, all postsutural . . . . . 2.
2. Entire front highly polished or with a large glossy central triangle extending to anterior margin and only narrowly separated from the shining orbits; more or less metallic coloured species . . . . 3.
   Not as above, the front usually only slightly shining or dull, the triangle usually small; if metallic coloured in part, then the front is not highly shining . . . . . 4.
3. Entire front highly polished; fore femora without a comb of small spines on inner surface . . . . . **Lissocephala** Malloch.
   The shining front and orbits separated by a narrow dull line on each side of the triangle; fore femora with a comb on inner apical half or more (?) . . . . . **Liodrosophila** Duda.
4. Acrostichal hairs in six or more rows . . . . . 5.
   Acrostichal hairs in two or four rows . . . . . **Scaptomyza** Hardy.
5. Acrostichal hairs in ten or more rows . . . . . **Leucophenga** Mik.
   Acrostichal hairs in six or eight rows . . . . . 6.
6. Distal costal incision exceptionally deep, the lobe thus formed prominent and black, usually protruding beyond margin . . . . . 7.
   Costal incision normal, the lobe sometimes dark but not protruding beyond wing margin . . . . . 8.
7. All three orbitals large and of about equal size; hind tibia with a distinct bristle about one-third from base on postero-dorsal surface; two pairs of subequal dorsocentrals; mostly pale yellowish species with darker markings . . . . . **Upolumyia** Malloch.
   Anterior reclinate orbital usually much smaller than other two; hind tibia without described bristly hair; often with only one pair of dorsocentrals; usually dark species or dark above and contrastingly pale below . . . . . **Mycodrosophila** Oldenberg.
8. Proboscis heavily chitinized, stout, straight and downwardly projecting, the apical section often as long as head height; central frontal triangle often distinct, large and subshining; oral margin indented medianly, the cheeks extended forward on either side; orbitals often in nearly straight row and about equally separated at bases . . . . . **Zygothrica** Wiedemann.
   Not entirely as above; rarely with any of the above characters . . 9.
9. Anterior dorsocentrals close to suture . . . **Microdrosophila** Malloch.
   Anterior dorsocentrals well separated from suture and close to posterior dorsocentrals . . . . . **Drosophila** Fallén.

4. Descriptions of and Notes on the Species.

Drosophila Fallén, 1823.

The genus *Drosophila* is the largest representative of the family in Samoa. A key to the species of the genus occurring in Samoa is given below. In compiling the key much use has been made of Malloch's (1934) key to species, especially in order to include those species unrepresented in the present collection.

Key to species of the genus *Drosophila* Fallén in Samoa.

1. Third antennal segment large, covered with long hairs . . . . . 2.
   Third antennal segment normal, covered with short fine pile . . . 5.
2. Costa with a small, distinct, dark mark at apex of first costal section **unicolor** Malloch.
   Costa without small dark mark at apex of first costal section . . . 3.
3. Front, face, upper half of occiput, mesonotum and scutellum black, remainder of insect pale yellow . . . . . **seminigra** Duda.
   General colour testaceous to yellow . . . . . 4.
4. Basal scutellars equal in length to apical scutellars . **manonoensis** sp. n.
   Basal scutellars just over half length of apical scutellars . **innocua** Malloch.
5. Prescutellar bristles present . . . . . 6.
   Prescutellar bristles absent . . . . . 10.
6. Scutellar bristles equal or subequal . . . . . 7.
   Basal scutellar bristles about half length of apical scutellars **bryani** Malloch.
7. Costal index less than 2·0 . . . . . 8.
   Costal index greater than 2·0 . . . . . 9.
8. Eyes bare . . . . . **samoaensis** sp. n.
   Eyes with dense, short, erect hairs . . . . . **excepta** Malloch.
9. Eyes bare . . . . . **fuscovitatta** sp. n.
   Eyes with dense, short, erect hairs . . . . . **marjoryae** sp. n.
10. Fore femora with an antero-ventral series of short stout spines **nasuta** Lamb
    Fore femora without such series of short stout spines . . . . . 11.
11. Arista with 11 or more branches . . . . . 12.
    Arista with 10 or less branches . . . . . 16.
12. Front densely silvery-white except on orbits and middle line **albifrontata** Malloch.
    Front without dense silvery-white colouration . . . . . 13.
13. Vibrissa single . . . . . 14.
    Vibrissa duplicated . . . . . 15.
14. Light coloured species, black abdomen, bivittate pleura **pleuvovittata** sp. n.
    Entirely dark species, no vittae on pleura . . . . **nigrifrons** Malloch.
15. Dark brown species; heavy bristles on four fifths of third costal section . . . . . **upoluae** Malloch.
    Light coloured species; heavy bristles on half of third costal section **hypopygialis** Malloch.
16. Blackish species . . . . . **convexa** Malloch.
    Light coloured species . . . . . 17.
17. Acrostichal hairs in six rows . . . . . **montium** de Meijere.
    Acrostichal hairs in eight rows . . . . . 18.
18. Costal index above 2·0 . . . . . **melanogaster** de Meijere.
    Costal index below 2·0 . . . . . **ananassae** Doleschall.

Drosophila manonoensis sp. n.

Male.

General : a light yellow species with dark abdomen. Body length about 2·5 mm.; wing length about 2·0 mm.

Head : arista with about six branches, one below in addition to the terminal fork; blackish brown, yellowish-brown basally. Antennae light yellowish-brown; third segment at least twice length of second segment, covered with long, fine, whitish pile and longer hairs on anterior margin; second segment with two bristles. Front yellowish-brown; just less than half width of head at vertex; ocellar triangle between ocelli, brown and distinctly raised. Three strong fronto-orbitals, the ratio of their lengths, anterior to posterior, 3 : 2 : 3, the anterior reclinate closer to proclinate than to posterior reclinate and on the line between these two bristles; row of short hairs on anterior half of frontal orbit extending from anterior reclinate; about four or five small, inwardly directed hairs on either side of anterior median region of front. Face light yellow. Carina narrow and sharply ridged, extending at most two-thirds down face, not sulcate. One strong vibrissa; second oral bristle not differentiated; two bristles at lower angle of cheek. Eyes dark red in pinned specimens; almost bare, with a few, fine, short hairs only. Vertical diameter of eye about eight times width of cheek in same axis. Cheeks yellowish-brown. Proboscis light yellow, brown at lobes; palpi yellowish-brown, one strong apical and one smaller median bristle.

Thorax : yellowish-brown dorsally; yellow laterally. Scutellum yellowish-brown, slightly convex. Acrostichals in about eight irregular rows; no prescutellars; anterior dorsocentral just greater than half length of posterior dorsocentral; basal scutellars divergent and equal in length to apicals; three humerals; two sternopleurals, sterno-index about 0·5.

Legs light yellow. Apical bristles on first and second tibiae, that of second strong; weak preapicals on all three tibiae.

Wings clear; veins light brown; third costal section with heavy bristles on its basal nine-tenths; two bristles at distal costal break, one stronger than the other; costal index about 1·6; fourth vein index about 1·8; 4*c* index about 1·25; 5*x* index about 2·2.

Halteres brown, light yellow basally.

Abdomen : first segment yellowish-brown; remaining segments with yellowish-brown band anteriorly, wide dark brown, uninterrupted band posteriorly. Both bands becoming progressively darker towards posterior segments so that apical segments appear almost completely black.

Type male, SAMOA : Manono Island, 6.xi.1950.

This species is a member of the subgenus *Hirtodrosophila* Duda, but because of the lack of knowledge of some internal characters, and of immature forms, it cannot yet be placed in any species group of the subgenus.

This species brings the number of species of the subgenus known from Samoa to four.

Drosophila bryani Malloch.

D. bryani Malloch, 1934, *Insects of Samoa*, Part VI : 310. (fig. 7 ; fig. 4.)

The following additional or more precise descriptions of some characters of this species are given below:

Arista with eight branches, two below in addition to the terminal fork; branches long and slender, bent terminally at tip, those nearest base bent most strongly.

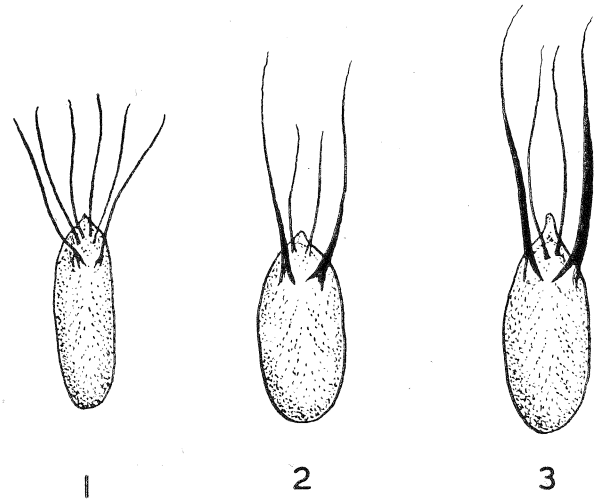
Three prominent sternopleurals, the two dorsal ones equal in length or the anterior of the pair just shorter; ventral bristle below and posterior to the middle one; sterno-index

about 0·7–0·75. Basal scutellars convergent. Costal index about 1·65; 4th vein index about 2·3; 4*c* index about 1·4; 5*x* index about 2·5.

External male genitalia have the following characters: Genital arch broad below; densely bristled on lower portion, upper portion with two smaller bristles; ventral margin not concave; heel with horn-like process; toe rounded, broad. Anal plate separated from genital arch; heavily bristled. Clasper without obvious lobe-like process projecting below primary teeth; about 12 primary teeth in a concave row; no secondary teeth.

Eggs with six filaments all approximately equal in length and about three-quarters length of egg.

Specimens were collected by sweeping foliage and from rotting fruit at Vailima and Malololelei, Upolu and Manono and Apolima Islands from November, 1950, to January, 1951. 161 specimens were examined but about twice this number were collected.

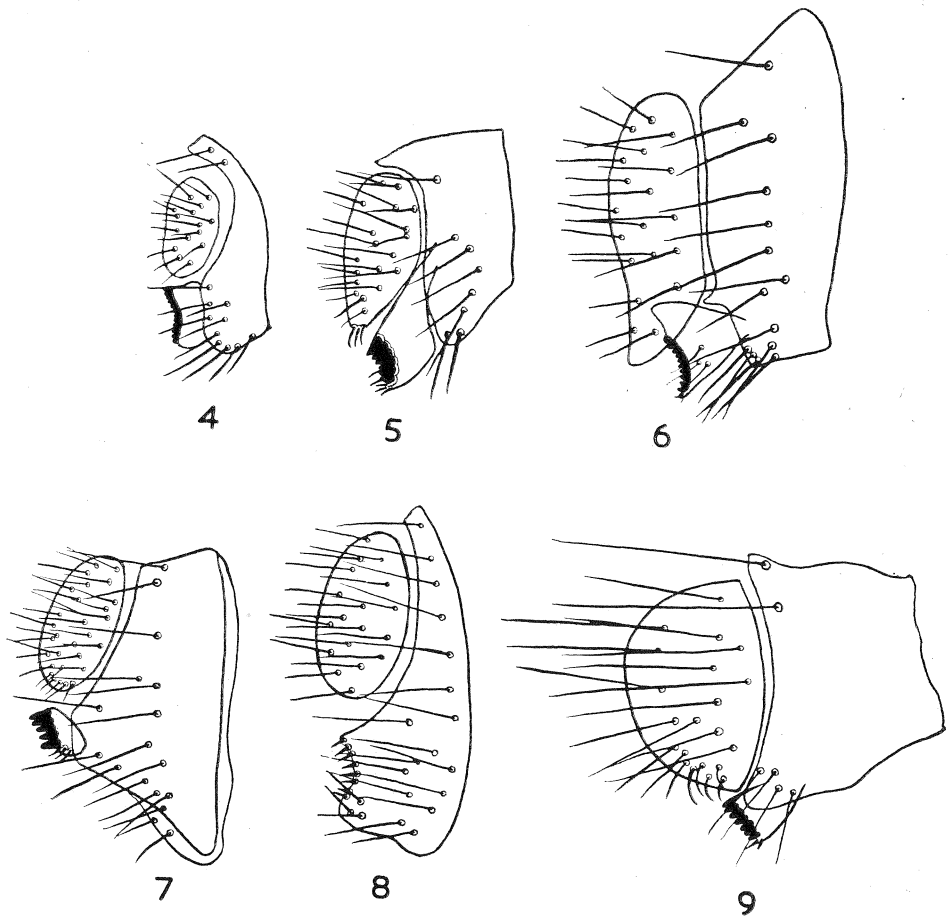


FIGS. 1–3.—Eggs of (1) *Drosophila bryani* Malloch, (2) *D. hypopygialis* Malloch, (3) *D. nasuta* Lamb.

Wheeler (1949) considers that this species possibly belongs to the *victoria* species group of the subgenus *Pholadoris* Sturt. With the knowledge of the above characters its position in this species group is even more certain. The sternopleurals are quite definitely three in number and not two as Malloch (1934) recorded; costal index is below 2·0; 4th vein index is between 2·2 and 2·4; 5*x* index is between 1·4 and 2·4; external male genitalia have a horn-like process on the genital arch, the teeth of the clasper are in a concave row and the arch and anal plate are heavily bristled especially ventrally; egg has six filaments. All these are important subgeneric or species group characters. Two characters, viz., convergent basal scutellars and clasper without obvious lobe-like process projecting below primary teeth, are not in accordance with the present definition of the *victoria* species group. However, in this species the orientation of the basal scutellars is a difficult character to describe and its

importance should not be emphasised too much. The clasper character may not prove to be of major importance in separating the species groups.

Because of the lack of knowledge of the internal characters of the adult and of larval and pupal characters, this species cannot yet be placed with certainty in the *victoria* species group.



FIGS. 4–9.—Male external genitalia of (4) *Drosophila bryani* Malloch, (5) *D. nasuta* Lamb, (6) *D. hypopygialis* Malloch, (7) *D. samoaensis* sp.n. (8) *D. nigrifrons* Malloch, (9) *D. fuscovittata* sp. n.

Drosophila samoaensis sp. n. (fig. 7).

Male.

General: a small fulvous species. Body length 1·5–2·0 mm.; wing length 1·25–1·5 mm.

Head: arista with about seven branches, two below in addition to the terminal fork; blackish-brown, basal segment brown. Antennae yellowish-brown; third segment covered with fine pile; second segment with two bristles. Front light golden brown with anterior

region and orbits narrowly yellowish-brown; small blackish-brown or reddish-brown spot between or slightly posterior to posterior ocelli; ocellar area between ocelli raised. Three fronto-orbitals, the ratio of their lengths, anterior to posterior, 5 : 2 : 7, the anterior reclinate orbital closer to proclinate than to posterior reclinate; row of small hairs on anterior half of frontal orbit, extending from anterior reclinate; some few, small, inwardly directed hairs in a V-like formation on median front. Face light yellow. Carina distinct, widens slightly ventrally and stops short of epistome, not sulcate. One strong vibrissa; second oral bristle not differentiated, two bristles at lower angle of cheek. Occiput brown. Eyes dark red in pinned specimens; bare. Vertical diameter of eye about 10 times width of cheek in same axis. Cheeks light yellowish-brown. Proboscis yellowish-brown with brown oral lobes; palpi yellowish-brown with about four bristles on anterior margin.

Thorax: yellowish-brown. Scutellum slightly convex. Acrostichal hairs in about six irregular rows; pair of enlarged prescutellars about three quarters length of anterior dorsocentral; anterior dorsocentrals half length of posterior dorsocentrals; basal scutellars parallel or slightly convergent, just larger than apical scutellars and just under half way from base of scutellum to apical scutellars; two humerals; three prominent sternopleurals, the two dorsal ones equal in length, ventral one below and just posterior to middle one; sterno-index about 0·73.

Legs light yellowish-brown, tarsal tips not darkened. Apical bristles on 1st and 2nd tibiae; preapicals on all three.

Wings clear, veins light brown; third costal section with heavy bristles on its basal two-thirds; one differentiated bristle at distal costal break; costal index about 1·75; 4th vein index about 2·35; 4*c* index about 1·4; 5*x* index about 2·25.

Halteres light yellowish-brown.

Abdomen: yellowish-brown; 4th segment with blackish-brown posterior band narrowed or completely interrupted medianly and widened to almost complete width of tergite laterally; remaining segments completely blackish-brown.

External male genitalia have the following characters: genital arch broad below, not rounded, with a large projecting heel; toe at a higher level than heel; about 14 hairs on lower half, one about one-third way down and two dorsally. Anal plate separated from genital arch; about thirty bristles, shorter and closer together near ventral corner. Clasper small, triangular, a single row of five very stout, strong and prominent teeth arranged in straight or slightly convex row; some strong hairs on lower portion; lower portion does not project beyond lower teeth.

Type male, SAMOA: Manono Island, swept off foliage, 6.xii.1950.

Paratypes: three males, same data as type.

This species would appear to be a member of the subgenus *Pholadoris* Sturt. The following characters are in agreement with those of the subgenus; prescutellars present; hairs on front form a V; arista has seven branches, two below; second oral bristle is short; sterno-index is between 0·7 and 0·9; middle sternopleural is well developed; costal index is less than 2·0; 4th vein index is between 2·2 and 2·4; cheek is narrow; middle orbital is short; heavy bristles on basal two thirds of third costal section.

The following characters show that, of the two established species groups, this species is more closely related to the *mirim* group than the *victoria* group. It is a yellowish species with black abdominal markings; anterior scutellars are convergent; cheeks very narrow; bristles on male genitalia not very dense below; clasper small and triangular. One character is not in accord with the definition of the *mirim* species group. There are six and not eight rows of acrostichal hairs. In the series studied the rows are very irregular and the interpretation of this character could be in error.

The important group differentiating characters of the larvae and of the malpighian tubules are not known. This species therefore cannot yet be placed in any species group.

Drosophila marjoryae sp. n.

Female.

General : an entirely yellowish-brown species with brown bristles. Body length about 2·5 mm. ; wing length about 2·25 mm.

Head : arista with about seven branches, two below in addition to the terminal fork ; axis black apically, yellowish-brown basally. Antennae fulvous ; third segment normal ; second segment with two bristles. Front golden yellow, fulvous anteriorly ; about half width of head at vertex ; ocellar triangle between ocelli brown and distinctly raised above level of front. Post-verticals small ; three fronto-orbitals, the ratio of their lengths, anterior to posterior bristle, 10 : 5 : 9, the anterior reclinate just closer to proclinate than to posterior reclinate and just lateral to the line between these two bristles ; row of distinct hairs from anterior reclinate along anterior orbit ; many inwardly directed hairs on most of anterior region of front and on median front almost to ocelli and a pair of almost parallel rows of strong hairs. Face yellowish-grey. Carina narrow dorsally and prominent and nose-like ventrally, not sulcate. Strong vibrissa, no differentiated second oral bristle ; two or three bristles at lower angle of cheek. Eyes dark red in pinned specimens, covered with dense whitish-brown pile. Vertical diameter of eye about ten to twelve times width of cheek in same axis. Cheeks brown. Proboscis predominantly brown ; palpi yellowish brown, with up to four large bristles on anterior margin and many smaller hairs.

Thorax : yellowish-brown except shaded darker region on anterior mesonotum. Scutellum convex. Acrostichals hairs in eight rows ; pair of prescutellars present, about equal in length to anterior dorsocentrals ; anterior dorsocentrals about half length of posterior dorsocentrals ; basal scutellars divergent, just shorter than apical scutellars and placed about half way between latter and base of scutellum ; two humerals ; three prominent sternopleurals of the two dorsal ones the anterior is just larger than the posterior ; ventral one below and slightly posterior to middle one, sterno-index about 0·8.

Legs light yellowish brown, not darkened at tarsal tips. Apical bristles on first and second tibiae ; preapicals on all three ; those of second tibia strong.

Wings clear ; veins yellowish-brown ; third costal section with heavy bristles on its basal two-thirds ; distal costal break without a well-differentiated pair of enlarged bristles ; costal index about 2·3 ; 4th vein index about 1·9 ; 4*c* index about 1·0 ; 5*x* index about 1·1.

Halteres yellowish-brown.

Abdomen : yellowish-brown.

Type female, SAMOA : sealevel, Manono Island, 27.xii.1950

Paratypes : 3 females. Same data as type.

This species is named in honour of my wife who assisted in the tedious task of labelling specimens in this collection.

This species would appear to belong to the subgenus *Pholadoris* Sturt. on the basis of the following characters : Prescutellars are present ; hairs on median front numerous and arranged in a pair of nearly parallel rows ; arista with seven branches, two below ; three strong sternopleurals ; sterno-index between 0·7 and 0·9 ; third costal section with heavy bristles on basal two-thirds ; middle orbital about half other two ; second oral bristle reduced ; cheeks narrow. All these are important subgeneric characters but their combined value is reduced somewhat by the wing indices. In this species the costal index is 2·3 which is higher than any yet recorded for the subgenus. Likewise the 4th vein index of 1·9 is lower than any yet recorded for the subgenus and

the 5*x* index of 1·1 is outside the range of those recorded. These differences cannot be regarded as excessive and *D. marjoryae* would appear to be most satisfactorily placed as an unclassified species of the subgenus *Pholadoris*.

Drosophila fuscovittata sp. n. (fig. 9).

Male and Female.

General : a yellowish-brown species. Body length about 2·5 mm. ; wing length about 2·0 mm.

Head : arista with about 10 to 12 branches, three or four below in addition to the terminal fork ; axis black, yellowish-brown basally. Antennae yellowish-brown ; third segment brown on outer and apical margin ; second segment with two bristles. Front golden yellow, lighter yellow anteriorly ; ocellar triangle not darkened between ocelli, slightly raised above level of front. Three fronto-orbitals the ratio of their lengths, anterior to posterior bristle, 6 : 3 : 8, the anterior reclinate lateral to and level with or slightly anterior to proclinate ; some minute hairs on anterior half of orbit anterior to middle orbital ; some few inwardly directed strong hairs on anterior median region of front. Face light greyish-yellow. Carina distinctly ridged and extends about two thirds down face, not sulcate. One vibrissa ; hairs on cheek strong and second oral bristle slightly longer than remaining hairs ; two prominent bristles at lower angle of cheek. Occiput dark brown. Eyes dark red in pinned specimens ; bare. Vertical diameter of eye about 10 times width of cheek in same axis. Cheeks light yellow. Proboscis yellowish-brown, rostrum margined with brown anteriorly ; palpi yellowish-brown, with about four bristles on anterior margin.

Thorax : yellowish-brown with three longitudinal brown vittae ; one vitta extending from dorsal humerus, above notopleural suture, to dorsal of wing base ; another broader vitta extending from below humerus, across mesopleura, below wing base to haltere ; another vitta extending from behind anterior coxa, through the dorsal half of the sternopleura and across the hypopleura. Scutellum slightly convex. Acrostichal hairs in eight rows ; pair of prescutellars present, just longer than anterior dorsocentrals ; anterior dorsocentrals under half length of posterior dorsocentrals ; basal scutellars divergent, just longer than apical scutellars in length and about one third of distance from base of scutellum to apical bristles ; two humerals ; three sternopleurals, posterior pair prominent, the posterior bristle of the dorsal pair about twice length of anterior bristle ; ventral bristle below and posterior to middle one ; sterno-index about 0·4.

Legs light yellowish-brown, tarsal tip not darkened. Apical bristles on first and second tibiae ; preapicals on all three tibiae ; those of second tibiae strong.

Wings light brown ; veins brown, third costal section with heavy bristles on its basal three-quarters ; two distinct bristles at distal costal break ; costal index about 2·5 ; 4th vein index about 1·9 ; 4*c* index about 1·0 ; 5*x* index about 1·6. Halteres yellowish-brown.

Abdomen : yellowish-brown with tesselated pattern of irregular brown areas on basal three segments and more regular brown areas in the form of posterior bands on tergites of posterior segments. Bristles and hairs on tergites stronger on apical segments. Genital plate of female large, broadly triangular, heavily chitinized dark blackish-brown, with large black teeth, about three on ventral margin and about seven on dorsal edge.

External male genitalia have the following characters : Genital arch not heavily chitinized mostly covered by preceding tergite ; heel prominent ; toe at higher level than heel ; two dorsal bristles and four ventral bristles extending over clasper. Anal plate large ; separated from genital arch ; many long bristles scattered over its whole surface with slightly bunched shorter hairs at lower corner. Clasper small, triangular ; seven or eight distinct black teeth in a straight row ; one narrow and one broad short hair at lower corner below teeth.

Type male, SAMOA : Upolu, Vailima, 17.xi.1950.

Paratypes male, same data as type ; female, SAMOA : Manono, 24.xi.1950.

This species has several characters which are typical of the subgenus *Pholadoris* Sturt., viz., prescutellars present ; second oral bristle reduced ; three sternopleurals; cheeks narrow; heavy bristles on basal three quarters of third costal section. There are, however, some important characters which are quite distinct from those of the subgenus as understood at the present time. The arista has ten to twelve branches ; sterno-index is 0·4 ; wing indices are different from those defined for the subgenus ; female genital plates are large and distinct. The external male genitalia are not typical of the subgenus ; the clasper agrees well but the anal plate is very much enlarged and densely covered with bristles while the arch is almost bare.

As a result the position of *D. fuscovittata* in the subgenus is very doubtful and it would best be regarded at the present time as unplaced in the genus, but with possible affinities to the subgenus *Pholadoris*.

Drosophila ananassae Doleschall.

D. ananassae Doleschall, 1858, *Nat. Tijd. Ned. Ind.* **17** : 128.
D. errans Malloch, 1934, *Insects of Samoa*, Part VI : 301.

322 specimens were examined and many more were collected. It is of interest to note that no other members of the *melanogaster* species group were obtained. Two other members were recorded by Malloch (1934), viz., *D. melanogaster* Meig. and *D. montium* de Meij. Malloch (loc cit.) gave no indication of the proportions of these three species which he had made available to him but there can be no doubt from the large number of *D. ananassae* in this collection that it is the predominant species of the group in Samoa.

Specimens were obtained at Vailima and Malololelei, Upolu and Manono Island and Apolima Island from November, 1950, to January, 1951.

Drosophila nasuta Lamb (figs. 3 and 5.).

D. nasuta Lamb, 1914, *Trans. Linn. Soc. Lond.* **16** : 346.
Spinulophila nasuta (Lamb) Malloch, 1934, *Insects of Samoa*, Part VI : 311.

The following additional and more precise description of some characters of this species are given :

Male and Female.

Two sternopleurals, often a third small middle bristle dorsal to the posterior bristle and anterior to it ; sterno-index about 0·6. Costal index about 3·4 ; 4th vein index about 1·46 ; 4*c* index about 0·66 ; 5*x* index about 1·15.

External male genitalia have the following characters : Genital arch broad at top, narrow and distinctly rounded beneath ; about eight bristles on lower half, two smaller ones near top. Anal plate not attached to genital arch with dense fairly evenly placed bristles, two or three smaller curved bristles at lower corner. Clasper single, with six or seven strong black teeth in a concave row, some fine bristles near lower corner and at the corner a few stout bristles.

Eggs with four filaments ; anterior pair equal to length of egg, posterior longer than egg.

Specimens were collected off foliage and rotting fruit at Vailima and Malololelei, Upolu and at Apolima and Manono Islands, Samoa during November,

December, 1950, and January, 1951. About 180 specimens are mounted but many more were captured.

This species is a member of the *immigrans* species group of the subgenus *Drosophila*.

Drosophila hypopygialis Malloch (figs. 2 and 6.).

D. hypopygialis Malloch, 1934, *Insects of Samoa*, Part VI : 307.

The following additional and more precise description of the characters of this species are given.

Male and Female.

Three prominent sternopleurals, rather than two as given in the original description, two dorsal bristles, posterior one about two-thirds length of anterior, ventral bristle below and posterior to middle bristle, sterno-index about 0·7–0·75.

Costa with one strong bristle at distal costal break ; costal index about 3·8 ; 4th vein index about 1·33 ; 4*c* index about 0·60 ; 5*x* index about 1·07.

Acrostichal hairs in eight rows which are usually regular in the female but irregular in the male.

External male genitalia have the following characters : genital arch fairly evenly broad and rectangular below with horn like projection on posterior margin just above clasper ; about 14 bristles with a few of them clustered at posterior lower corner. Anal plate separated from genital arch ; with dense evenly spaced bristles. Clasper single with concave row of about ten black teeth on lower three-fifths of the posterior margin, some stout hairs projecting beyond teeth and bristle-like hairs at lower corner.

Egg with four filaments ; anterior pair about two-thirds length of egg and tapering ; posterior pair about equal to egg length and tapering.

Specimens were collected by sweeping foliage and from rotting fruit at Vailima and Malololelei, Upolu and Manono Islands, Samoa during November, 1950, to January, 1951. Seventy two specimens were collected.

From what is now know of this species it would appear to be a member of the subgenus *Drosophila* Fallén. The following characters are essentially of this subgenus : egg with four filaments, anterior pair tapering ; abdomen with dark posterior bands ; sterno-index greater than 0·5 ; costal index over 3·0. Malloch (1934) suggested an affinity with *Spinulophila nasuta* (Lamb) which we now understand as a member of the *immigrans* species group of this subgenus. *D. hypopygialis* does not have the row of femoral spines which is so characteristic of the species group, but instead has a distinct row of hairs in the normal position of the spines in some specimens. These are slightly stronger than the surrounding hairs. It may be found that the presence of a row of distinct femoral spines need not be a distinguishing characteristic of the group. The external male genetalia show characters of the *immigrans* species group such as the concave row of ten primary teeth on the clasper and the presence of stout bristles on its posterior margin.

D. hypopygialis is best regarded at the present time as a member of the subgenus *Drosophila* without obvious relationship to any species group.

Drosophila pleurovittata sp. n.

Female.

General : a fulvous species with black abdomen and distinct vittae on the pleura. Body length about 2·5 mm. ; wing length about 2·0 mm.

Head : arista with about fourteen branches, three below in addition to the terminal fork which in the type consists of three branches ; brownish-black, basal segment yellowish-brown. Antennae yellowish-brown ; third segment with relatively long fine, whitish pile giving a matt appearance ; second segment with two black bristles and a few short hairs ; first segment with small black hairs. Front somewhat shining reddish brown, lighter anteriorly ; about half width of head at vertex ; ocellar triangle black and raised between ocelli. Three fronto-orbitals, the ratio of their lengths, anterior to posterior bristles, 7 : 3 : 11, the anterior reclinate orbital closer to proclinate than to posterior orbital ; some small hairs on anterior half of frontal orbit ; no hairs on anterior median region of front. Face yellowish-brown dorsally, grey medianly and whitish-grey ventrally. Carina reduced to a small raised ridge on dorsal third of face, not sulcate. Strong vibrissa ; no differentiated second oral bristle ; two bristles at lower angle of cheek. Occiput brown, sharply ridged at vertex. Eyes dark red ; with minute sparse blackish short hairs. Cheeks linear, yellowish-brown with a black line along lower margin. Proboscis black, yellowish-brown on posterior rostrum ; palpi black, stout with black apical bristle and smaller anterior bristles.

Thorax : mesonotum fulvous anteriorly to dark reddish-brown posteriorly ; pleura yellowish-brown with one dark reddish-brown vitta from below humerus to wing base and another vitta from behind middle of fore coxa, fringing sternopleura dorsally and extending to near base of the haltere. Scutellum darker than mesonotum, convex. Acrostichal hairs in six rows ; no prescutellars ; basal scutellars divergent, equal to apical scutellars in length ; anterior dorsocentrals two-thirds posterior dorsocentrals ; two small humerals ; one enlarged hair mediad to presutural ; three prominent sternopleurals, the two dorsal ones equal in length ; ventral one below and posterior to the middle one, sterno-index 0·7.

Legs yellowish-brown except for fuscous regions on apical third of femora and basal quarter of tibia, of the mid and hind legs ; tarsal tip not darkened. Apical bristles on first and second tibiae, that of second particularly strong ; preapicals on all three tibiae.

Wings clear but smoky at base ; veins light yellowish-brown, darker basally ; third costal section with heavy bristles on its basal three-sevenths ; two strong bristles at distal costal break ; costal index about 3·35 ; 4th vein index about 1·5 ; 4*c* index about 0·66 ; 5*x* index about 1·3. Halteres reddish-brown with light yellow pedicel and scabellum.

Abdomen : shining black, some slight grey dusting on tergites of basal three segments.

Type female, SAMOA : Upolu, Malololelei, swept off foliage, 18.xi.1950.

This species is very similar to *D. albifrontata* Malloch especially in shape and general coloration. However, it is regarded as a distinct species on the following morphological grounds : The distinctive white vittae on the front of *D. albifrontata* are lacking ; the proboscis is predominantly black ; wings are darkened at base, some wing indices show apparent differences ; eyes are only sparsely clothed with hairs ; legs have dark bands.

Both these species are not yet known well enough to be able to place them in any of the established subgenera. They do show, however, in the possession of relatively long hairs on the third antennal segment, a similiarity to the subgenus *Hirtodrosophila*.

Drosophila nigrifrons Malloch (fig. 8.).

Drosophila nigrifrons Malloch, 1934, *Insects of Samoa*, Part VI : 304.

The following additional characters are given :—

Arista with about thirteen branches, three below in addition to the terminal fork. Three sternopleurals, the anterior dorsal bristle about three-quarters length of posterior

dorsal one, ventral bristle below and posterior to middle one; sterno-index about 0·6. Costal index about 3·4; 4th vein index about 1·5; 4*c* index about 0·68; 5*x* index about 1·3.

The male external genitalia have the following characters: genital arch long, narrow dorsally, widens below to quadrangular shape; ventral margin slightly concave; heel lower than toe; about seventeen strong bristles evenly situated over body of arch; about eight smaller stubby light brown hairs on posterior margin; three bristles near lower posterior corner. Anal plate separated from arch; about 17 strong bristles evenly situated on its surface. Clasper absent.

Specimens were collected by sweeping vegetation at Malololelei, Upolu, 18.xi.1950 and at Manono, 5 and 6.xii.1950.

This species is interesting because of the complete absence of a distinctly separated clasper. In this case the clasper may have become indistinguishably fused to the arch. There are no distinct teeth but stout short hairs on the posterior edge of the arch which apparently have taken over the function of clasper teeth.

This species cannot be placed yet with certainty into any subgenus.

Genus *Microdrosophila* Malloch, 1921.

This genus is represented by one species in Samoa.

Microdrosophila convergens (Malloch) (**comb. nov.**).

Hopkinsomyia convergens Malloch, 1934, *Insects of Samoa*, Part VI: 289.

The following additional characters for this species are given :—

Apical scutellars distinctly divergent. Sterno-index about 0·45. Costal index about 1·2; 4th vein index about 4·0; 4*c* index about 2·8; 5*x* index about 4·0.

Specimens were collected at Malololelei, Upolu (2000 ft.) on 18.xi.1950 and Manono Island on 28.xii.1950.

There can be no doubt that *Hopkinsomyia* Mall. is a synonym of *Microdrosophila* Malloch for it agrees with all generic characters as defined for *Microdrosophila* by Malloch (1921) and Sturtevant (1942). Although *M. convergens* is close to the genotype *M. quadrata* (Sturt.) it differs in the number of branches of the arista, the wing indices and possibly the number of acrostichal hairs (eight in *M. quadrata* but six irregular rows in *M. convergens*).

As stated above *M. convergens* has distinctly divergent apical scutellars and this character may become an important generic character when it is known for some other members of the genus.

Leucophenga Mik, 1886.

This genus is well known from many parts of the world. Malloch (1934) suggested the possibility of it occurring in Samoa. It is not common there and only one specimen was obtained.

Leucophenga samoaensis sp. n.

Male.

General: a light brown species with unmarked wings. Body length about 2·5 mm.; wing length about 2·0 mm.

Head : arista with about ten branches, three below in addition to the terminal fork ; axis black apically, light brown basally. Antennae light brown ; third segment darker brown and covered with thick fine pile ; second segment with one median black bristle and some few black hairs ; first segment with a few conspicuous hairs on inner margin. Front reddish-gold, lighter anteriorly ; under half width of head at vertex ; ocellar triangle small, black and raised above level of front between ocelli ; orbits brown. Post-verticals small ; three fronto-orbital bristles, the ratio of their lengths, anterior to posterior bristle, 11 : 3 : 11, the anterior reclinate closer to proclinate than posterior reclinate and lateral to it, proclinate and posterior reclinate relatively close ; some small hairs in a line from anterior reclinate anteriorly along orbit ; inwardly directed small hairs on a narrow area from ocelli, to middle of anterior margin of front. Face light brown. Carina almost entirely absent and discernible only dorsally. Strong vibrissae present ; second oral bristle not differentiated. Eyes dark red in pinned specimen ; bare. Cheeks light yellowish-brown ; linear. Proboscis yellowish-brown ; palpi brownish-black, curved, with one apical bristle and several smaller and finer hairs anteriorly.

Thorax : mesonotum light reddish-brown, somewhat shining, pleura lighter. Scutellum coloured as for mesonotum, convex. Acrostichals hairs in about ten irregular rows ; prescutellar acrostichals all enlarged, middle pair very strong about one and one-third times length of anterior dorsocentral ; basal scutellars divergent, 1·5 times as long as apical scutellars ; anterior dorsocentrals two-fifths posterior dorsocentrals ; one humeral ; two sternopleurals, sterno-index about 0·8.

Legs light yellow, not darkened at apical tarsal segments. Apical bristles on first and second tibiae, that of first short ; preapicals on all three tibiae ; mid tarsi with row of closely adherent short stout spinules along entire length of each segment on posterior ventral and anterior ventral surfaces.

Wings slightly pointed ; clear but marginal cell somewhat darkened ; veins all light yellowish-brown ; costa ending at apex of third vein ; third castal section with heavy bristles on its basal two thirds and small black wart-like protuberences on the underside ; pair of slightly enlarged bristles at distal costal break ; costal index about 2·5 ; 4th vein index about 2·0 ; 4*c* index about 1·2 ; 5*x* index about 1·5.

Halteres light brown.

Abdomen : basal segment light brown ; second segment light reddish-brown interrupted by black area about the incurving edge of the tergite ; third segment same, but the black areas are shifted to the lateral margin of the tergite and a small black spot at the middle of the posterior margin ; fourth segment black with a small indefinite yellowish-brown area on anterior median region of tergite ; remaining segments black.

Type male SAMOA : Manono Island, swept off foliage, 6.xii.1 950.

The above species constitutes the first record of the occurrence of the genus *Leucophenga* in Samoa. The species is quite distinctive with its blackish palpi, almost clear wings which are somewhat pointed, and the abdominal colour pattern. It would appear to be closely related to *L. guttiventris* de Meijere, a species which has been found in Fiji as well as elsewhere in Australian region.

Lissocephala Malloch, 1929

Key to the species of the genus *Lissocephala* Malloch occurring in Samoa and Fiji.

1. Wings with dark basal transverse streak . . . . . 2.
–. Wings without black basal streak . . . . . **pallidipennis** sp. n.
2. Knob of halteres black . . . . . **versicolor** Malloch.
–. Knob of halteres light reddish-brown . . . . . **fijiensis** sp. n.

Lissocephala versicolor Malloch.

L. versicolor Malloch, 1934, *Insects of Samoa*, Part VI : 287.

The following additional characters are given :—

Pair of slightly enlarged prescutellar hairs. Sterno-index about 0·9. Costal index about 0·8 ; 4th vein index about 2·0 ; 4*c* index about 1·7 ; 5*x* index about 2·25. Dark streak at base of wing commences on the costa at either side of the distal costal break.

Specimens were collected by sweeping foliage at SAMOA : Upolu, Vailima, 17.xi.1950 and at Manono Island, 28.xi.1950, and taken on rotting fruit SAMOA : Manono Island, 26.xii.1950.

Drosophila metallescens de Meij., as Malloch (1934) suggested, would appear to be a *Lissocephala*. From its description, it is related to *L. versicolor* but is probably closer to *L. fijiensis*.

Lissocephala fijiensis sp. n.

Female.

General : a glossy light reddish-brown species. Length of body about 2·25 mm. ; length of wing about 1·75 mm.

Head : arista with about seven branches ; three below in addition to the terminal fork ; dark brown, light brown basally. Antennae light reddish-brown ; third segment a shade darker apically and covered with distinct fine pile ; second segment with two strong bristles and strong hairs. Front glossy, dark reddish-brown posteriorly, brown anteriorly and medianly ; about half head width at vertex. Post-verticals short ; three fronto-orbitals, the ratio of their lengths, anterior to posterior, 5 : 3 : 8, the anterior reclinate lateral to and level with or just anterior to proclinate ; few hairs on anterior half of frontal orbit ; some inwardly directed hairs on anterior region of front. Face brown. Carina narrow but prominent, ending abruptly before epistome ; not sulcate. One strong vibrissa ; second oral not differentiated ; two fine bristles at lower angle of cheek. Eyes brownish-red in pinned specimens, with thin short brown pile. Cheeks linear, brown. Proboscis light reddish-brown ; palpi light brown with one strong and two weaker bristles in a cluster near apex.

Thorax : entirely glossy, light reddish-brown with slight metallic violet hue. Scutellum dull brown, not markedly dusted at apex, almost flat. Acrostichal hairs in about six rows ; pair of slightly enlarged hairs in prescutellar region ; basal scutellars parallel or slightly convergent, about half length of apicals ; one humeral ; two sternopleurals, sterno-index about 1·0.

Legs light yellowish-brown, tarsal tip not darkened. Fore tibiae with weak apical and preapicals ; mid tibiae with strong apical and preapicals ; hind tibiae with strong preapicals only.

Wings clear with narrow blackish band extending from distal portion of first costal section diagonally across first vein and back through posterior cells to alular region ; veins light brown ; costa strong to a point just beyond apex of third vein, hence very weak to apex of fourth vein ; third costal section with heavy bristles on its basal five-sixths ; pair of bristles at distal costal break, one stronger than the other ; costal index about 0·7 ; 4th vein index about 1·7 ; 4*c* index about 1·7 ; 5*x* index about 1·75.

Halteres light reddish-brown,

Abdomen : glossy light reddish-brown to dark brown with faint metallic hues in some lights.

Type female, FIJI : Suva, Botanical Gardens, swept off grass, 14.xi.1950.

This species is close to *L. versicolor* Mall. The two species are readily distinguished by means of the key but they also differ in general coloration, particularly on the thoracic pleura, and in the wing vein indices such as the fourth vein and 5*x* indices.

Lissocephala pallidipennis sp. n.

Female.

General : a small shining brown species with clear unmarked wings. Body length about 1·5 mm. ; wing length about 1·75 mm.

Head : arista with about nine branches, three below in addition to the terminal fork ; brownish-black. Antennae brown ; third segment blackish-brown apically and dorsally, covered with distinct fine pile ; second segment with two bristles and distinct hairs. Front glossy shining brown with large ocellar triangle extending to anterior margin of front. Ocellars and verticals long ; post-verticals short ; three fronto-orbitals, the ratio of their lengths, anterior to posterior, 13 : 2 : 12, the anterior reclinate much closer to proclinate than to posterior reclinate. Face brown and somewhat shining. Carina slightly developed dorsally and only differentiated about one third distance down face, not sulcate. One strong vibrissa present ; no differentiated second oral bristle. Eyes dark red in pinned specimen ; covered with distinct dark pile. Vertical diameter of eye at least 10 times width of cheek in same axis. Cheeks light brown. Proboscis yellowish-brown ; palpi dark brown and with one strong bristle near apex and other weaker bristles on anterior margin.

Thorax : glossy light brown dorsally and laterally as far as the dorsal margin of sternopleura, hence light yellowish-brown. Scutellum also glossy light brown with, however, some light dusting ; markedly convex especially at margin. Acrostichal hairs in about eight irregular rows ; no prescutellars ; anterior dorsocentral just over half length of posterior dorsocentral ; basal scutellars divergent and equal in length to apical scutellars ; two humerals ; two sternopleurals, sterno-index about 0·5.

Legs light yellowish-brown ; tarsal tip not darkened. Apical bristles on first and second tibiae, that of first minute, that of second very strong ; preapicals on all three tibiae, that of first minute, that of second strong.

Wings clear, without darkened veins or dark stripes ; veins light yellowish-brown, third costal section with heavy bristles on its basal two-thirds ; one strong bristle at distal costal break ; costal index about 0·85 ; 4th vein index about 2·5 ; 4*c* index about 2·2 ; 5*x* index about 2·75.

Halteres brown.

Abdomen : shining light brown with some slight greyish dusting.

Type female, SAMOA : Upolu, Vailima, 17.xi.1950.

This species is similar and apparently related to *L. versicolor* Mall., but it is readily distinguished by the lack of the black stripe at the base of the wing.

Liodrosophila Duda, 1922.

This genus is close to *Lissocephala* Malloch but is readily separated from it by having the front not entirely glossy.

Liodrosophila flavipes sp. n.

Male.

General : a shining black fly with light yellowish legs. Body length about 2·25 mm. ; wing length about 2·25 mm.

Head : arista with about fifteen branches, four below in addition to the terminal fork ; black. Antennae blackish-brown ; third segment with fine short pile which is larger and tuft-like apically ; second segment with brown area on apical dorsal region, two black bristles and some long hairs on inner apical margin. Front with large ocellar triangle reaching anterior margin, shining black ; orbits shining black ; dull stripe between triangle and orbits narrowed to vertex ; over half width of head at vertex. Three fronto-orbitals, the ratio of their lengths, anterior to posterior, 7 : 2 : 12, the anterior reclinate orbital closer to proclinate than posterior reclinate ; few small hairs on anterior half of frontal orbit ; no hairs on anterior median region of front. Face shining blackish-brown. Carina reduced and only present on dorsal half of face, not sulcate. One strong vibrissa ; second oral bristle not differentiated ; two bristles at lower angle of cheek. Eyes reddish-brown in pinned specimens ; with fine short and sparsely situated hairs. Cheeks dark brown and linear. Proboscis brown to dark-brown with blackish-brown lobes ; palpi dark brown with one strong apical and two smaller bristles on anterior margin.

Thorax : entirely shining blackish-brown with some dusting but yellowish ventrally. Scutellum slightly convex. Acrostichals in four rows ; no prescutellars ; anterior dorsocentrals about two-thirds posterior dorsocentrals ; basal scutellars divergent close to base of scutellum and equal in length to the apicals ; two humerals ; three prominent sternopleurals, the posterior dorsal one larger than anterior dorsal, ventral one below and posterior to middle one, sterno-index about 0·5.

Legs light yellow, tarsal tip not darkened. Apical bristles on first and second tibiae, that of second very strong ; preapicals on all three tibiae, that of second also very strong.

Wings clear ; veins light brown ; third costal section with heavy bristles on its basal two-fifths ; pair of strong bristles at distal costal break, costa extends to fourth vein ; costal index about 3·8 ; 4th vein index about 1·65 ; 4*c* index about 0·65 ; 5*x* index about 1·5.

Halteres yellowish-brown basally, more fulvous apically.

Abdomen : shining dark brown dorsally ; bristly.

Type male, SAMOA : Upolu, Malololelei, swept off foliage, 18.xi.1950.

This species is placed in the genus *Liodrosophila* Duda because of the distinctive characters of the front. In this species, however, the row of stout spines on the antero-ventral surface of the fore femora is absent. This character has heretofore been regarded as an important character of the genus, especially as a means of distinguishing between it and *Lissocephala* Mall., but when further information about the genus is obtained this character may be relegated to one of subgeneric value.

It can be noted here that *Liodrosophila australis* Mall. is almost certainly a *Lissocephala* and is very similiar to *Lissocephala versicolor* Mall. and *L. fijiensis* and *Drosophila mettalescens* de Meij.

Zygothrica Wiedemann, 1830.

Zygothrica samoaensis Malloch.

Z. samoaensis Malloch, 1934, *Insects of Samoa*, Part VI : 278.

The following additional and more precise description of some characters of this species are given :—

Eyes with a covering of fine very short and sparsely situated hairs. Sterno-index about 0·55. Costal index about 2·0 ; 4th vein index about 1·9 ; 4*c* index about 1·1 ; 5*x* index about 1·6. Third costal section with heavy bristles on its basal half.

One specimen was collected by sweeping foliage at SAMOA : Upolu, Vailima, 17.xi.1950.

Samoaia Malloch, 1934.

Samoaia ocellaris Malloch.

S. ocellaris Malloch, 1934, *Insects of Samoa*, Part VI : 271.

Additional characters for this species are :—

Sterno-index about 0·6. Costal index about 2·2 ; 4th vein index about 0·5 ; 4*c* index about 1·0 ; 5*x* index about 0·5. Third costal section with heavy bristles on its basal half.

Specimens were collected by sweeping along bush track, SAMOA : Malololelei, 2000 ft., and at Vailima, Upolu, 17 and 18.xi.1950.

Samoaia hirta Malloch.

S. hirta Malloch, 1934, *Insects of Samoa*, Part VI : 275.

Additional characters for this species are :

Sterno-index about 0·6. Costal index about 1·8 ; 4th vein index about 1·4 ; 4*c* index about 1·1 ; 5*x* index about 1·3. Third costal section with heavy bristles on its basal two-thirds.

One specimen was collected by sweeping vegetation at SAMOA : Malololelei, 2000 ft., Upolu, 18.xi.1950.

5. DISCUSSION.

As no attempt was made to culture the species, this study of the Drosophilid fauna of Samoa has been a morphological one. Thus some important characters are lacking for all species and as a result it has been impossible to place the majority of species into their species group or subgenera with certainty. Where specimens were collected in sufficient numbers, however, to allow dissections of male external genitalia and the recovery of eggs from ovipositors and ovaries, it has been possible to assign such species with more accuracy to their proper positions in their genera.

Thus in the Samoan members of the genus *Drosophila* there are four members of the subgenus *Hirtodrosophila*, five possible members of the subgenus *Pholadoris*, three of the *melanogaster* species group of the subgenus *Sophophora*, one of the *immigrans* species group of the subgenus *Drosophila* and some unclassified species.

Morphological characters satisfactorily distinguish the subgenus *Hirtodrosophila* and it is of great interest that Samoa has four members of a total of 27 known for the world. One of the most interesting facts is the presence of so many species which appear to belong to the subgenus *Pholadoris*. This subgenus has recently been surveyed by Wheeler (1949) and he recorded a total of nine described species as well as some as yet undescribed. There are indications that this subgenus is also well represented inNew Zealand (unpublished data). These facts may indicate that in the South Pacific a sizeable proportion of the Drosophilid fauna has developed from the *Pholadoris* division of the genus.

The analysis of the collection shows that the predominant Drosophilids in Samoa during November to January are *D. ananassae*, *D. nasuta*, *D. bryani* and *D. hypopygialis*. Collection records show that all are common in the coastal region about domestic habitats. Other species are less common. The figures may have been influenced by the great ease in collecting the four common species as they are all feeders on rotting fruit and thus plentiful in the coastal plantations.

Our knowledge of the Samoan Drosophilidae is far from complete. There are undoubtedly more species awaiting discovery, more particularly, perhaps, in the inland rain forest areas. In addition most species need to have many more of their characters described before their taxonomy is fully understood.

6. Acknowledgments.

The collections were made while the author was a member of a medical research expedition to Samoa. This expedition was organised and financed by the Medical Research Council of New Zealand. Grateful acknowledgments and thanks are extended to the Council for the privilege and opportunity of visiting Samoa.

Thanks are extended to Dr. J. Armstrong, Apia Hospital, Samoa, for organising and facilitating collecting trips to various localities.

Acknowledgment is also made of the assistance of the British Museum (Natural History) in lending specimens for purposes of comparison.

7. Summary.

Notes on a collection of Drosophilidae made in Samoa from November 1950, to January 1951, are given.

Additional or corrected taxonomic characters are given for the following species: *Drosophila bryani* Mall., *D. nigrifrons* Mall., *D. nasuta* Lamb, *D. hypopygialis* Mall., *Microdrosophila convergens* Mall., *Lissocephala versicolor* Mall., *Zygothrica samoaensis* Mall., *Samoaia ocellaris* Mall. *S. hirta* Mall.

The following new species are described: *Drosophila manonoensis*, *D. fuscovittata*, *D. marjoryae*, *D. samoaensis*, *D. pleurovitatta*, *Leucophenga samoaensis*, *Lissocephala pallidipennis*, *Liodrosophila flavipes*.

The following new species from Fiji is also described: *Lissocephala fijiensis*.

8. References.

Malloch, J. R., 1921, *Ent. News* **32**: 312.

——, 1934, *Insects of Samoa*, Part VI: 267–313.

Sturtevant, A. H., 1942, The classification of the genus *Drosophila* with descriptions of nine new species. *Univ. Tex. Publ.* **4213**: 5–51.

Wheeler, M. R., 1949, The subgenus *Pholadoris* (*Drosophila*) with descriptions of two new species. *Univ. Tex. Publ.* **4920**: 143–156.

——, 1952, A key to the genera of Drosophilidae of the Pacific Islands (Diptera). *Proc. Hawaii. ent. Soc.* **14**: 421–423.

PUBLICATIONS

The principal Publications of the Royal Entomological Society are *Transactions* and *Proceedings*.

The **Transactions** form an annual volume, each paper in the volume being issued as a separate part. The parts are issued irregularly throughout the year.

The **Proceedings** are issued in three series:

Series A General Entomology
Series B. Taxonomy
Series C. Journal of Meetings

Series A and B are issued in twelve parts, forming an annual volume of approximately 240 pages each.

The following information is supplied for the guidance of authors wishing to submit papers for publication in any of the Society's journals.

TRANSACTIONS

Papers offered for publication in the *Transactions* are considered by the Publication Committee of the Society which meets usually in the months of May and November. In order that papers may be considered at these meetings it is necessary for the manuscript and drawings for illustrations to be in the hands of the Registrar fourteen days before the meeting of the Committee.

The Society is prepared to undertake the provision of a reasonable number of figures, in line or half-tone. Colour work is accepted only by special arrangement.

Papers of less than eight printed pages (approximately 7,000 words) will not normally be accepted for the *Transactions* and papers by authors who are not Fellows of the Society must be communicated by a Fellow.

PROCEEDINGS SERIES A AND SERIES B

Papers submitted for publication in either *Series A* or *Series B* of the *Proceedings* are considered by the Editor and may be submitted at any time. Papers by authors who are not Fellows of the Society may be accepted if they are communicated by a Fellow.

Line blocks will be provided by the Society. Half-tone and colour work are accepted only by special arrangement and the author may be required to pay for the blocks.

PROCEEDINGS SERIES C

Series C is issued before every General Meeting. It contains abstracts of communications to be made, together with the titles of papers accepted for publication in the *Transactions*.

The annual subscription to *Series A, General Entomology*, is £2 0*s*. 0*d*.; *Series B, Taxonomy*, £2 0*s*. 0*d*. (single parts 4*s*. 0*d*.); and *Series C, Journals of Meetings*, 6*s*. 0*d*.

As from January, 1936, the journal *Stylops* is continued as *Proceedings Series B, Taxonomy*. Copies of volumes 1–4 are available at £1 16*s*. 0*d*. each, post free.

GENERAL

The original drawings for all figures must be supplied by authors and must be drawn to a scale which will permit of their reduction, singly or after grouping, to an area of dimensions not exceeding 7 by $4\frac{1}{2}$ in.

A uniform method is adopted for the citation of bibliographical references in the Society's publications as follows:

SMITH, A., 1936, New species of COCCIDAE. *Proc R. ent. Soc. Lond.* (B) 6 : 301–306, pl. 1.

——, 1936, New species of COCCIDAE. *Trans R. ent. Soc. Lond.* 84 : 901–936.

Titles of periodicals cited are to be abbreviated in the manner indicated in the *World List of Scientific Periodicals, 3rd edition*, 1952.

Authors are entitled to receive 25 copies of their papers free of charge and may purchase additional copies provided that request be made before publication.

Papers offered for publication should be sent to the Registrar, Royal Entomological Society of London, at 41, *Queen's Gate, London, S.W.* 7, and must be typewritten on one side of the paper only, with double spacing. **All papers must be provided with a summary.**

MEETINGS

TO BE HELD IN THE SOCIETY'S ROOMS

41, Queen's Gate, S.W. 7

1954

Friday-Monday, July 23–26 **(at York).**
Wednesday, October 6.
,, November 3.
,, December 1.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

The Fellowship and Fees

Fellows pay an Admission Fee of £2 2*s*. The Annual Contribution, £3 3*s*., is due on the first day of January in each year, and is payable in advance. Fellows under the age of 25 years on the date of election are exempt from the payment of the Entrance Fee.

Fees should be paid to the Hon. Treasurer, at 41, Queen's Gate, S.W. 7, and *not to the Hon. Secretary*.

Fellows desiring to pay their Annual Contribution through their bankers may obtain an official form of bankers' order by applying to the Hon. Treasurer.

Fellows whose Contributions for the current year have been paid are entitled to receive the *Transactions* and *Proceedings* of the Society free of charge. Further copies may be purchased at reduced prices by applying to the Hon. Secretary.

Forms for application for Fellowship, copies of the Bye-Laws and the List of Fellows may be obtained from the Hon. Secretary.

Meetings and Exhibitions

Fellows and others wishing to make a communication to a General Meeting of the Society are requested to send in their names, the title of their exhibit, and a short abstract of their remarks, to the Hon. Secretary fourteen days before the meeting at which it is proposed to make the communication. Should it be desirable to publish a fuller account of the communication the manuscript may be submitted for publication in *Proceedings Series A* or *Series B*. If the epidiascope is required, 24 hours' notice must be given. Objects for projection should not exceed 6 in. by 6 in.

Fellows resident abroad, or otherwise unable to attend meetings, are reminded that notes or observations sent to the Hon. Secretary may be communicated to a General Meeting on their behalf.

PRINTED FOR THE SOCIETY BY ADLARD AND SON, LTD., BARTHOLOMEW PRESS, DORKING.