

(*Timberlake*), (paratypes); seven females, eight males reared from material collected March 24, 1920, Honolulu Plantation, Oahu (*Swezey*), (paratypes). Also from the following Formosa material, from eggs of *Perkinsiella saccharicida* and possibly of other Delphacidae on sugar cane: two females, one male reared March 13-28, 1916, Tainan, Formosa (*Muir*), (paratypes); and one female, one male reared December 7, 1916, Tainan, Formosa (*H. Sauter*), (paratypes).

Types and paratypes in the collection of the Hawaiian Sugar Planters' Experiment Station, No. 1003, paratypes in the author's collection.

On Some Samoan Fulgorids (Homoptera).

BY F. MUIR.

Hawaiian entomologists have always been interested in the insect fauna of the Samoan archipelago, especially since Dr. Perkins described a species of *Proterhinus** from there. As none of the Hawaiian entomologists could arrange to visit Samoa, Mr. W. M. Giffard did the next best thing—he interested a resident of Pago Pago in insects and persuaded him to collect.

In the latter part of 1917 Mr. Giffard, through his friend, Captain J. H. Trask of the S. S. Sonoma, started a correspondence with Captain J. M. Poyer of the U. S. N. who at that time was Governor of American Samoa. Governor Poyer referred him to Dr. H. C. Kellers, U. S. N., then stationed in Tutuila. This was a very fortunate choice as Dr. Kellers, although professing to be no entomologist, got together a very interesting collection which, in some of the groups of smaller insects, has given us our first good idea of what is present in the islands of Tutuila and Niue. This good result is also partly due to Mr. Giffard's advice as to what to look for and to the collecting apparatus that he forwarded to Dr.

* Pro. Haw. Ent. Soc. I, 3, p. 88, July, 1907.

Kellers. Hawaiian entomologists must, therefore, thank Governor Poyer, Dr. Kellers, and Mr. Giffard for our increased knowledge of Samoan insects. I must also mention Captains Trask and Dawson of the Oceanic S. S. Coy, who kindly took charge of packages and saw to their safe delivery.

The length of time it has taken to work out this collection is due first to the war, which turned the attention of so many scientific men to work immediately connected with the war, and then to the difficulty of getting specialists to work up some of the groups. At present some are in the hands of specialists and we hope the remainder will shortly be attended to.

The present paper deals only with the fulgorids and gives us some idea of that group in the islands of Tutuila and Niue for the first time. It consists of twenty-six species distributed in nineteen genera and seven families, viz:

Cixiidae, five genera, six species.

Delphacidae, six genera, nine species.

Achilidae, one genus, two species.

Ricaniidae, one genus, two species.

Derbidae, two genera, two species.

Tropiduchidae, two genera, two species.

Issidae, two genera, three species.

When we compare these with Hawaiian fulgorids a distinct difference is at once seen. Not a single genus is common to both regions, with the exception of the introduced *Perkinsiella*, and in this instance the species are distinct. Hawaii has only two families represented, Cixiidae by two genera and a few species and Delphacidae with numerous species, and several genera belonging to a tribe not present in Samoa. Turning to the Cicadoidea we find a still greater difference, as Samoa has representatives of Cicadidae, Cercopidae and Cicadellidae, whereas Hawaii has only representatives of Cicadellidae.

This strongly indicates that there has been no land connection between these two archipelagoes, since they received their fulgorid fauna which, judging by the antiquity of the suborder to which they belong, must have been from about the time of their first appearance on dry land bearing vegetation.

When we compare the Samoan with the Fijian fulgorids a strong relationship is revealed. So far as we know at present the Samoan fulgorid fauna is a poor representation of the Fijian, which in turn is a poor representation of the Malayan and Philippine.

Hitherto the Malay Archipelago has been considered with little reference to the Philippines, but as the latter is the richest part of the Malays, so far as insects are concerned, it will be necessary in future to reconsider many conclusions as to dispersal in the light of recent work in the Philippines. It is to be hoped that the outlying islands of the Polynesian plateau will be thoroughly worked in the near future so that we may be able to trace the line of migration of many of these insects.

Samoa, judging by the fulgorids of Tutuila, is an outpost of the Polynesian plateau and derived its fulgorids from that region. It is not necessary to join it up to that region by land to account for their presence, as I think they could have arrived by natural means of transport across a moderately wide expanse of water. In some cases, such as *Perkinsiella* in Niue, man may have been the agency.

The genitalia of most of the families of Fulgoroidea have not been studied, or only in a very superficial manner. I believe that detailed studies will lead to a better understanding of the relationship of the families. Some interesting forms are found among this small collection revealing complexities quite unexpected.

The types have all been deposited in the collection of the Hawaiian Sugar Planters' Experiment Station, Honolulu, and numbered with the type number of that collection. The measurements are from apex of vertex to apex of abdomen and from the base to apex of one tegmen.

CIXIIDAE.

Myndus roggeweyni sp. n. Fig. 6.

Male. Length 2.8 mm., tegmen 3.4 mm. Vertex considerably longer than width at base, which is broader than apex; a faint transverse carina about middle; length of face equal to width, widest at apical third; median ocellus distinct.

The genitalia are asymmetrical; the anal tube is large and broad, on the left side it is produced into a large, blunt spine, the right side is expanded with two small projections on its edge; the pygofer on medio-ventral edge produced into an acutely angular process, the left margin slightly curved, the right produced into a flat, quadrate process about the middle; genital styles flattened, angular, narrowest at base, apex truncate; penis long, jointed near apex, which is membranous, with functional orifice at apex, the penis is surrounded by a long, tubular sheath with two small spines at apex and a long spine at base.

Stramineous, slightly darker over mesothorax. Tegmina hyaline, slightly stramineous, veins same color, tubercles numerous, small, bearing light macrotrichia; apical veins tinged with brown, especially at apices, cross veins also brownish; wings hyaline, veins yellowish.

Female. Length 3 mm., tegmen 3.4 mm. Similar to male. The ovipositor brown.

Described from four males and three females from Tutuila, Samoa, from 750 to 1200 feet elevation. (*Kellers*, April to December, 1918.) Type No. 1004. Named after the navigator who is credited with having been the first European to see the Samoan islands and named them Bauman Islands.

***Leirioessa lamononi* sp. n.**

Male. Length 2.8 mm., tegmen 4 mm. Typical of the genus and closely related to the genotype, *L. tortricomorpha* Kirk. Head, pronotum and mesonotum brown, apex of clypeus and legs lighter, abdomen slightly darker. Tegmina light brown, a dark mark from base of costal cell to middle of claval margin, where it is darker; a broader band from middle of costa across tegmen to apex of clavus, the margins being darker, a small dark mark at stigma, another on hind margin slightly beyond clavus, a dark mark across apical radial and apical median cells; veins same color as membrane, tubercles minute, brown; wings fuscous with darker veins.

Ventral edge of pygofer emarginate with an acute angular projection in the middle; anal segment long, apex obtusely pointed, lateral margins deflexed and inflexed, anus about one-third from apex; genital styles flat, narrow at base gradually widening to rounded apex, angular at apical third.

Female. Length 3.8 mm., tegmen 5 mm. In color slightly darker than the male. In this genus the abdominal sternites are not V-shape but transverse, the base of the ovipositor being near the apex of abdomen and projecting well beyond.

Described from one male and two females from Tutuila, Samoa, 700 to 1200 feet elevation. (*Kellers*, April, June,

July, 1918.) Type No. 1005. I name this species after the ill-fated naturalist of the Astrolabe who lost his life at Tutuila in 1788.

Austroloma baumanensis sp. n. Figs. 7, 7a.

Male. Length 2.6 mm., tegmen 3.8 mm. In the tegmina M3+4 bent at nearly right angle, forcing the apical portions of Cu1 and Cula* together.

Medio-ventral edge of pygofer produced into a small process, lateral edges roundly produced; anal segment short and broad, apex slightly rounded, broad, with a short, angular projection near each corner, anus slightly distad of middle; genital styles flat, slightly curved, slightly broadest at apex, which is subtruncate and slightly oblique; aedeagus large and complex, basal two-thirds tubular, flexed at one-third from apex, a small spine just basad of the joint, apex with a strong, curved spine at the apex of which the functional orifice appears to be situated; basad of this there is a membranous lobe on each side.

Light brown, outer angles of mesothorax laterad of outer carinae dark brown; a series of small, brown spots on temples and sides of clypeus; legs with small brown bands; abdomen yellow or light brown, pygofer dark. Tegmina hyaline, fuscous at base, in middle of clavus, from stigma to middle of tegmen, over cross veins spreading out to apex; veins mostly lighter with brown tubercles.

Female. Length 2.7 mm., tegmen 4.2 mm. Ovipositor not projecting beyond apex of abdomen; inclined to be darker than the males, especially the abdomen, which is brown.

Described from twenty-six males and thirty-seven females from Tutuila, from 700 to 1200 feet elevation. (*Kellers*, April to December, 1918.) Type No. 1006. This insect is named after the islands called Bauman islands by Roggewein in 1721, and supposed to be the same as the Samoan islands.

Austroloma wilkesi. sp. n. Fig. 16.

This species differs from *A. baumanensis* in being uniformly light brown with no dark marks on legs, few or no dark tubercles on tegmina and the lateral portions of mesonotum not darker than middle.

The male genitalia are very distinct. There is no projection from the edge of the anal segment and the genital styles are not quite so curved. From the apex arises on the right side a long, sinuate process nearly as long as the aedeagus, from the left side of apex a thin, wider process with a small spine near base and a larger one about

* I agree with Tillyard in considering Cu2 as forming the claval suture.

the middle; a spine arises about the middle of the aedeagus. Length of male 2.3 mm.; tegmen 3.3 mm. Length of female 2.8 mm., tegmen 3.5 mm.

Described from two males and two females from Tutuila, Samoa, from 760 to 1200 feet elevation. (*Kellers*, April and December, 1918.) Type No. 1007. This insect is named after the navigator who first surveyed the Samoan islands. There are six specimens of females which I placed in this species but have not considered as paratypes. They are darker with more or less black tubercles on the tegmina.

Urvillea dumonti sp. n.

This genus hitherto has been represented only by one species from Fiji. This species from Samoa is quite typical but specifically distinct.

Male. Length 2.7 mm., tegmen 4.8 mm. Vertex and face dark brown with carinae light, pronotum light brown, darker on lateral portions, mesothorax and abdomen dark brown, legs light. Tegmina hyaline, the apical cells and portion of subapical cells infuscate, veins yellow, tubercles minute bearing fine, light macrotrichia; wings hyaline, apical area fuscous, veins dark.

Anal segment large, flattened horizontally, anus at apex; pygofer long ventrally, short dorsally, considerably flattened horizontally, medio-ventral edge produced into a small, angular process, lateral margins roundly produced; genital styles small, flat, apex truncate, oblique, outer margin slightly concave, inner margin convex slightly sinuate; aedeagus complex but not dissected out.

Described from one male specimen from Tutuila, Samoa (*Kellers*, June, 1918), from 1200 feet elevation. Type No. 1008. This genus and species is named after Dumont d'Urville who explored the Pacific in the *Astrolabe*.

Meenoplus Fieb.

I have not been able to procure specimens of *Meenoplus albosignatus* Fieb., the type of the genus, but Fieber's figures and descriptions are excellent and leave little to be desired. The only difference that I can find between *Nisia* Mel. and this genus is the absence of an apical vein (M2). The claval veins may join together slightly basad in *Nisia* and Fieber shows a small vein from the second claval to hind margin which does not exist in *Nisia*. But these differences do not

warrant a generic separation in my opinion. It is no uncommon thing to find the apical veins differing on each tegmen of a specimen.

The group of genera to which this genus belongs forms a distinct division of the Cixiidae and could form a subfamily, Meenoplinae. The following nine genera, perhaps with some others, would come into the subfamily: *Meenoplus* Fieb., *Anigrus* Stal, *Nisia* Mel., *Phaconeura* Kirk., *Suva* Kirk., *Eponisia* Mats., *Paranisia* Mats., *Inxwala* Dist., *Paranigrus* Bergr.

Dr. E. Bergroth* has recently written on this group and it is hoped that in the near future he will give us a critical survey of the genera composing it.

My interpretation of the venation of some of these genera is shown in figures 2 and 3. In *N. atrovenosus* (Leth.) from Ceylon M2 is missing, M3 and Cu1 are fused for some distance. Cula is strongly angled near the base and there are two cross-veins, one of which is diagonal. *M. albosignatus* Fieb. appears to be similar but for the presence of M2. The first claval and the Sc + R are granulate. *Paranisia* is similar to *Nisia* in venation and *Eponisia* to *Meenoplus*. *Suva* differs from *Meenoplus* in having junction of M3 and Cu1 nearer the base of the former. *Phaconeura* agrees with *Suva* with the exception that M3 and Cu1 remain together to the margin of tegmen in the type species, but in *P. laratica* Muir they part company before the apex. In some specimens, including the type of this last species, there are three apical veins to the radius. It is to be hoped that the tracheation of these tegmina will be worked out in the nymph.

***Meenoplus langlei* sp. n.** Fig. 3, 3a.

Male. Length 1.7 mm.; tegmen 3.4 mm. M2 present, Cu1 touching M3 at its base then free, one cross vein between Cu1 and Cula, granulate along Sc + R and A1 (first claval), A1 and A2 meeting near apex of clavus. Anal segment short, curved, apex produced into two rounded processes; aedeagus fairly long, curved; genital styles long, thin, curved inward, their apices meeting on middle line, apices slightly

* Arkiv. for Zoologi. K. Svenska Vetensk. 12, 17 (1920).

expanded. Uniformly light yellow; tegmina hyaline, slightly white and opaque with waxy secretion, veins light yellow; wings hyaline, opaquely white with waxy secretion, veins yellowish.

Female. Length 1.7 mm.; tegmen 3.4 mm. Pregenital plate wider than long, quadrate, slightly emarginate apically; styles fairly large, projecting beyond the small anal segment. Color as in male.

Described from two males and one female from Tutuila, from 1000 to 2000 feet elevation (*Kellers*, April and September, 1918). Type No. 1009. This might easily be placed in a new genus judging by the venation, but I prefer to place it in *Meenoplus* until the group is revised. The species is named after the ill-fated De Langle of the *Astrolabe*, who was killed at Tutuila in 1788.

Nisia atrovenosa has been reported from such widely separated places as Madagascar, India and Australia, but an examination of the genitalia of specimens from Formosa and Australia shows specific differences. It is, therefore, possible that there are several species standing under this name. I have no males from Ceylon, so cannot say which are the typical genitalia.

ACHILIDAE.

Eurynomeus granulatus sp. n. Figs. 1, a, b, c, d.

This species conforms to the generic type with the exception that there are four branches to the media, and in some specimens the first branch is furcate at apex, making five apical median veins.

Male. Length 4 mm., tegmen 4.5 mm. Cinnamon, buff or clay color, darker over mesonotum. Tegmina thickly covered with light granules, most numerous basad of cross veins, darker bands across tegmina, one from costa to middle of hind margin of clavus, another from costa to apex of clavus and a very light one over cross veins; these bands fade out on some specimens; wings dark fuscous with dark brown veins.

The male genitalia of Achilidae are complex and have never been adequately described so far as I am aware. The pygofer of this species is comparatively short dorsally and laterally, but longer ventrally where the median portion of the hind margin is produced into two flat, pointed processes. The lateral edges being slightly emarginate; the anal segment is flat, broadly rotundate with the apex emarginate, anus distad of middle, anal style subovate; genital styles large, narrowest at base, broadest at apex where the upper or outer angle is produced, curved, and turned inward as two small points, another inwardly curved point nearer the middle, the inner angle roundly produced, the outer margin is thickened and from near the middle rises a long, curved,

strong, spine. The aedeagus is complex and consists of two parts forming more or less complete tubes. The inner tube is composed of a pair of flat, narrow processes, rounded at their apices and joined together at their bases where, in conjunction with a membrane, they form a tube into which the ejaculatory duct opens; a chitinous process proceeds from the base of this organ to the bases of the genital styles and co-ordinates their movements. The outer tube is composed of three pairs of processes joined together at their bases; the dorsal pair are pointed and bear small teeth along their dorsal surface. The lateral pair are larger, produced into a triangular spine at their bases, the distal portion being narrow, slightly sinuate and the apices rounded; the ventral pair are bifurcate, one portion projecting distad as a strong spine and the other curving under and inward as a strong spine. A strong, chitinous framework connects this outer tube to the base of the anal segment.

Female. Length 4 mm.; tegmen 5 mm. The eighth sternite is divided in the middle. the inner rounded edges meeting together, the seventh sternite is widely and roundly emarginate on the posterior margin. In coloration similar to the male.

Described from eight males and six females from Tutuila, Samoa, from 760 to 1200 feet elevation (*Kellers*, April, June, August, 1918). Type No. 1010. There are two other female specimens, larger and darker, which may represent another species.

***Eurynomeus niger* sp. n.**

This is congeneric with the above and has the same venation. Length 4.2 mm., tegmen 5 mm. Black; two small white marks at base of clypeus continued onto genae and on lateral margin of pronotum, legs dark brown, hind legs lighter. Tegmina black, a whitish mark across the middle of clavus to costa near base, broadest in clavus, thinning out to a point on costa, this area being thickly granulate, a few light granulations scattered about; wings dark fuscous with darker veins.

Described from one female from Tutuila, Samoa, about 1000 feet elevation (*Kellers*, June, 1918). Type No. 1011.

DELPHACIDAE.

***Ugyops kellersi* sp. n. Figs. 12, a.**

Male. Macropterous; length 6 mm., tegmen 5.4 mm. Vertex longer than wide (1.4 to 1), apex slightly wider than base, base slightly in front of middle of eyes; length of face 2.3 times the width, widest slightly before apex, two median carinae obscure at base but distinct at apex; antennae longer than head and thorax together, second joint 1.8 times the length of first.

Anal segment large, more than half the length of the abdomen, steeply tectiform, narrowed to apex which is rounded, anus about one-third from apex. Pygofer long on ventral aspect, medio-ventral edge produced into two small processes with rounded and slightly expanded apices; lateral margins widely angular; genital styles narrow, flattened, outer surface slightly concave, sides subparallel, apex with outer angle produced and curved round, apex and inner angle curved over; aedeagus long, thin, subtubular, passing through a basal sheath tube, bent and jointed about the middle.

Apple green or dull green yellow, turning stramineous in old specimens, darker, or in some specimens red between the median frontal carinae; legs inclining to light brown, tarsi and apical portion of first and second tibiae darker; the second joint of antennae darker than first with the apical half darker than basal; abdominal tergites and dorsal portion of anal segment brown. Tegmina hyaline, slightly greenish or yellowish, veins slightly darker, tubercles very minute, same color as veins, bearing small dark macrotrichia; a dark fuscous mark over the first apical median cell; wings hyaline, slightly fuscous, veins dark.

Female. Macropterous; length 6.8 mm., tegmen 6 mm. Anal segment, long, tubular, concave along the ventral side. Anus at apex; ovipositor projecting beyond anal segment. In color similar to male.

Tutuila, Samoa, from 700 to 1200 feet elevation; Pago Pago, Samoa, 300 feet elevation. (*Kellers*, April to October, 1918.) Type No. 1012. Described from twenty-eight males and twenty-five females. There is also a small series of young of this or one of the other species.

***Ugyops samoensis* sp. n.** Fig. 10.

Male. Macropterous; length 4.2 mm., tegmen 3.5 mm. Length of vertex 1.2 times the width of apex, base considerably narrower than apex, carinae slightly projecting in middle of apex, continued on to the face separately; length of face 1.8 times the width, narrowest at base, widest on apical half, median carinae separate and distinct till near apex, where they converge together and become obscure; antennae reaching to apex of clypeus, second joint 1.7 times the length of first.

Pygofer long on ventral aspect, short on dorsal; medio-ventral edge deeply emarginate, the bottom of the emargination projecting as a lip with truncate apex, angles of emargination slightly produced beyond which the edge is slightly emarginate; anal segment large, slightly longer than broad, anus near apex; genital styles small, largest at base gradually decreasing to pointed apex, slightly curved and recurved; aedeagus long, characteristic of the genus.

Light brown; vertex and base of face mottled with dark brown, a dark mark across face about one-third from apex; antennae with two darker bands around second joint; front and middle tibiae banded with

two small dark bands; pronotum with darker mottlings. Tegmina hyaline, clear, veins of similar color broken by dark marks, tubercles small bearing dark macrotrichia; wings hyaline with darker veins.

Female. Macropterous; length 4.8 mm., tegmen 4.2 mm. Anal segment tubular, ventral surface grooved longitudinally, length twice the width, anus at apex, ovipositor reaching to apex of anal segment. Color similar to male.

Described from eleven males and ten females from Tutuila, Samoa, from sea level to 1200 feet elevation, and ten males and three females from Savage Island or Niue. (*Kellers*, April to October, 1918.) Type No. 1013. The latter can be distinguished by the small projections at the angles of the emargination being larger than in the Tutuila specimens.

***Ugyops bougainvillei* sp. n.** Fig. 9.

Male. Macropterous; length 5.7 mm., tegmen 5.4 mm. Length of vertex 1.4 times the width at apex, which is slightly wider than base and moderately rounded, base considerably before the middle of eyes; length of face 2.4 times the width, narrowest between eyes, broadest a little before apex, two median carinae distinct to apex; antennae reaching beyond apex of clypeus, second joint twice the length of the first.

Anal segment large, length about 2.5 times the width, tectiform, anus near apex; pygofer long ventrally, short dorsally, medio-ventral margin emarginate, produced in middle into two small processes, slightly flattened laterally and pointed at apex, sides widely angularly produced; genital styles subparallel sided, slightly curved and recurved, excavate on front surface, the apex at outer angle produced into a small square process turned at right angle to the body of style, the inner angle produced into two processes, the distal one the larger; aedeagus long, characteristic of the genus, the apical portion being longer than in *U. kellersi*.

Stramineous, second joint of antennae fuscous, the apical half distinctly so, a faint trace of red between median frontal carinae, fuscous along the hind margin of mesonotum. Tegmina hyaline, stramineous, veins slightly darker, black or fuscous over greater portion of subcosta, at base and before cross veins on radius and over the other veins to hind margin at these two points, fuscous at base of margin of clavus, apex fuscous, forming a small spot at apex of radial cell; tubercles small, bearing black macrotrichia; wings hyaline, veins brown.

Female. Macropterous; length 6.4 mm., tegmen 6 mm., ovipositor projecting slightly beyond anal segment. Darker than the male, the fuscous on veins of tegmina darker and more extensive.

Described from one male and three females from Tutuila, Samoa, from 1100 to 2141 feet elevation (*Kellers*, April to September, 1919). Type No. 1014. This species is named after the great navigator who gave the old world the first knowledge of Samoa.

***Ugyops brevipennis* sp. n.** Fig. 11.

Male. Brachypterous; length 4.5 mm., tegmen 3.2 mm. Length of vertex equal to width, apex slightly wider than base, the two medio-lateral carinae continuing on to the face separately, projecting beyond apex; length of face twice the width, broadest between antennae, sides slightly arcuate, two distinct median carinae; antennae reaching beyond apex of clypeus, second joint very slightly longer than first; tegmina reaching to middle of pygofer, cubitus forked near base, all others simple, claval suture absent, hind margin of pronotum straight.

Anal segment large, length 1.4 times the width, ventral surface concave, anus about middle, apex broadly round; pygofer long ventrally, short dorsally, medio-ventral edge roundly emarginate, a small triangular projection at bottom of emargination and another at each corner with a small emargination beyond it; genital styles nearly straight, broadest at base, inner edge slightly concave, apices rounded; penis long and characteristic of genus.

Light brown, darker over carinae, along the hind margin of pronotum, base and apex of second joint of antennae, genae around antennae, coxae and abdomen. Tegmina dark brown, lighter over apical cross veins and adjoining veins, and from middle of clavus to basal portion of costal cell; veins prominent, apparently without tubercles and macrotrichia.

Female. Brachypterous; length 4.3 mm., tegmina 3.7 mm. Anal segment slightly longer than wide, tubular, slightly concave on ventral aspect, apex slightly emarginate, anus at apex; ovipositor projecting very slightly beyond anal segment. In color similar to male. There is a second female similar to the allotype except in size, viz., length 5.4 mm., tegmen 4.2 mm.

Described from one male from Tutuila, Samoa, elevation 1070 feet, and two females, the allotype from Tutuila, 300 feet and the other 1200 feet. (*Kellers*, April and June, 1918.) Type No. 1015.

***Dicranotropis cognata* Muir.**

Four specimens from Pago Pago (*Kellers*, April, 1918). Previously known from Queensland, Fiji and Philippine Islands.

Phyllodinus koebelei (Kirk.).

Phacalastor koebelei Kirk. (1906) Bull. H. S. P. A., Ent. I, p. 408.

Dicranoitropis koebelei (Kirk.) (1909) t. c. III, p. 134.

Twenty-eight brachypterous specimens, April, 1918, and one macropterous specimen, June, 1918 (*Kellers*), from Tutuila, Samoa. The front legs of this species are distinctly flattened and slightly expanded and so must come into the composite genus *Phyllodinus* Van D. as it stands at present.

Perkinsiella vitiensis Kirk.

Five specimens from Savage Island (Niue). (*Kellers*, August 6, 1918.)

Hitherto this species has only been known from Fiji. As this species is attached to sugar cane and this plant was carried by the natives in their early migrations, the distribution of the insect in the south Pacific would be of interest and might throw some light on the migration of the Polynesians. This applies to many insects attached to economic plants carried by the natives on their voyages.

Sardia pluto Kirk.

One specimen from Tutuila, Samoa. (*Kellers*, December, 1918), 1200 feet elevation. Previously known from Australia, Fiji, Formosa and Philippine Islands.

Megamelus proserpina Kirk.

One female specimen from Savage Island (*Kellers*, August 6, 1918). Previously known from Fiji, Amboina, Java and the Philippine Islands.

DERBIDAE.

Phaciocephalus tutuilae sp. n. Fig. 14.

Male. Length 3 mm., tegmen 4 mm. Very much like and closely allied to *P. vitiensis* Kirk.

Head, pronotum, tegulae and hind legs yellow, fuscous over apex of clypeus, mesothorax brown with the lateral angles lighter, front and middle legs fuscous, abdomen and genitalia brown, base of abdomen light.

Tegmina white with a longitudinal black mark starting from the

base of costa and ending at apex of R, covering half the radial cell longitudinally; posteriorly it is bounded by the claval suture and apical portion of the cubitus, another black mark along the hind margin of clavus. The white portion opaque with waxy secretion. Wings hyaline, fuscous, with brown veins.

Medio-ventral edge of pygofer produced into a flat process longer than broad with the apex rounded, the process turns dorsad and lies between the bases of the styles, lateral margins of pygofer straight; anal segment long, broadest at apex where anus is situated, apex produced into two short, broad spines turned ventrad; genital styles spatulate, the inner margin near the base produced into a short, strong spine; on the outer margin a little more distad there is a slender, curved process with blunt apex. The apical margin near the inner corner is produced into a strong, flat spine turned inward; aedeagus large, jointed in middle, but not dissected out.

Female. Length 2.7 mm., tegmen 4.6 mm. Similar to male. Genitalia including the seventh sternite (subgenital plate) dark brown. The hind margin of the seventh sternite produced into a quadrate process, the base of which is slightly broader than apex and the apical corners rounded.

Described from two males and six females from Tutuila, Samoa (*Kellers*, April to August). Type No. 1016. This species is very near to *P. vitiensis*, which differs in having the spine on the apical margin of styles very small, the styles narrower and the apex of anal segment not produced into such curved points. The females of these two species appear to be alike.

Lamenia caliginea Stal. Figs. 13, 13a.

This species was originally described from Tahiti, but I have not seen specimens from that locality. The long series from Tutuila and Niue (Savage Island) agree in all the characters described. I figure the male genitalia and the hind margin of the subgenital plate of female.

RICANIIDAE.

Plestia kellersi sp. n. Fig. 4.

Male. Length 4.4 mm., tegmen 8 mm. In venation and structure this is typical of the genus.

Anal segment about as broad as long, lateral margin rounded, anus near apex; genital styles subparallel sided to near apex, flat, the apical inner corner rounded, the outer produced into a point, the style looking like the head of a bird with a large neck; aedeagus short and broad,

two curved spines arise from near the apex, one on each side, and curved over dorsal aspect; just basad of these there is a small process.

Light green or stramineous, darker in old specimens; abdomen darker green; pygofer, anal segment and styles brown; a round black spot at lateral margin of the pronotum beneath the eyes.

Tegmina hyaline, veins brown, costal membrane, costal cell, the very narrow subcostal and apical subcostal cells brown with a darker mark at apex of subcostal cell and base of R2 and R3, the apical margin fuscous to the apex of clavus; wings hyaline, veins dark, hind margin slightly fuscous.

Female. Length 5 mm., tegmen 9 mm. Similar to male. Pygofer and anal segment dark brown, ovipositor light.

Described from two males and three females from Tutuila, Samoa, elevation 1200 feet (*Kellers*, April to December, 1918). Type No. 1017. The two males have a small cross-vein at the base of R2—3, which is absent in the female specimens. This species differs from *P. marginata* Montr., by having no light spots in costal membrane and no color bands on head and thorax. The genital styles of *P. marginata* have the apices hammer shape, being more bluntly pointed on the outer corner of apex and considerably and roundly produced on inner corner.

***Plestia anomala* sp. n.** Fig. 5.

Male. Length 3.7 mm., tegmen 7 mm. Female. Length 5 mm., tegmen 8 mm. The genital styles of this species are slightly narrower than *P. kellersi*, and the small process basad of the curved spine on the aedeagus is longer and thinner. In color and general build, it is the same as *P. kellersi*, except for one point in the venation of tegmina. In this species there is a submarginal row of cross-veins which is missing in *P. kellersi*, and the other two species of the genus. This character is enough to base a genus upon, according to the characters used in the family. But apart from this character the two species are so closely allied that I cannot agree in placing them in different genera.

It would be of great interest to study these two species and see if they interbreed and the result of interbreeding.

Described from two males and two females from Tutuila, Samoa (*Kellers*, April to December, 1918). Type No. 1018.

TROPIDUCHIDAE.

Vanua poyeri sp. n.

Male. Length 7.3 mm., tegmen 10.5 mm. Vertex slightly longer and more pointed at the apex and the face slightly longer and more pointed at the base, otherwise typical of the genus.

Male genitalia asymmetrical; pygofer deeply and angularly emarginate on ventral edge, lateral margins angularly produced, the right side more acutely, the left side with the angular production turned inward; anal segment symmetrical, large, long, fairly narrow, widened and rounded on apical half, apex rounded, anus about one-third from apex; only one median genital style, much longer than broad, sides subparallel, apex with slight emargination in middle, a large curved spine arises from left side about middle; penis long, slender cylindrical, with slender apex, jointed about one-fourth from apex, there is a membrane capable of expansion on apical third.

Light oriental green to straw color or light brown, in some specimens carinae slightly tinted with red; abdomen brownish. Tegmina and wings hyaline, veins light green, stramineous or light brown.

Female. Length 8.5 mm., tegmen 9.5 mm. Pregenital plate straight on hind margin with a semi-circular patch in middle of hind margin with a different texture to the rest of the sternite; anal segment semi-conical, the apex larger than base, ventral apical edge roundly produced. In color similar to male.

Described from eight males and seventeen females from Tutuila, elevation 900 to 1200 feet (*Kellers*, June, July, 1918). Type No. 1019. This species I have named after Captain J. M. Poyer, Governor of American Samoa.

Vanua angusta, sp. n. Fig. 15.

Male. Length 7 mm., tegmen 6.5 mm. Length of vertex slightly greater than width (1.2 to 1), widest just anterior of eyes, from where it narrows to a pointed apex; the face equally elongated and pointed at base, the diagonal carinae on face reaching to anterior margin of eye, as in the type species. In all other respects similar to genotype.

Genitalia asymmetrical; pygofer similar to *V. poyeri*, but the projection on right side flat, broad, bent at right angles and with slightly rounded apex, that on left side small, narrow with rounded apex, anal segment long, narrow, apex pointed with a large, curved spine beneath pointing basad, anus about one-third from apex; the single median genital style broad, subparallel sided, apex truncate with two small emarginations, a curved spine arises on left edge slightly apical of middle; penis long, cylindrical, with apex developed into a small, round process beset with small teeth and large, semi-membraneous process, broad at base and pointed at apex with two rows of small teeth.

Light green turning to straw color or light brown in older specimens. Tegmina and wings hyaline, veins green or yellowish brown.

Female. Length 7.5 mm., tegmen 7 mm. Pregenital plate with a semi-quadrate emargination on the hind margin, wider than deep; anal segment conical, short, anus at apex, ventral apical edge not much produced. Color similar to male.

Described from six males and six females from Niue or Savage Island (*Kellers*, August 6, 1918). Type No. 1020.

This species is of interest because it stands between the type species and *Rhinodictya* Kirk. Melichar's tribe Peggiogini for those Tropiciduchidae having elongated heads I think is a purely artificial one. *Vanua*, *Leptovanua* and *Rhinodictya* are closely allied, but *Peggioga* is nearer to *Numicia*.

The condition of the genital styles in this family is of interest. On some genera, i. e. *Ommatissus loufouensis* Muir, these organs are symmetrical and separate with their bases near together; the penis is surrounded by a ring from which projects a pair of long, slender processes nearly as long as the long, thin, tubular, penis. In *Tambinia formosa* Kirk. and allied genera the genital styles are symmetrical, but their bases are amalgamated so that they act as a single organ; the penis is partly surrounded by a sheath. In *Vanua* and allied genera the genital styles are joined together to the apex and form a single asymmetrical organ; the penis has no surrounding sheath or homologous structure. We also find a corresponding modification of the tegmen. In *Ommatissus* the venation is simple and there is no costal area; in *Tambinia* the tegmen is broader, the venation more numerous and there is an indication of a costal area. In *Vanua* the tegmen is broad, there is a large costal area with cross-veins and the venation is much more numerous. This would indicate that the primitive type had a tegmen with a simple venation without costal area and a complex aedeagus with a penis surrounded by a more or less complex structure, and two genital styles which were symmetrical.

ISSIDAE.

Capelopterum maculifrons sp. n. Figs. 17, 17a.

Male. Length 4.3 mm., tegmen 4.8 mm. Vertex broader than long; face slightly longer than broad, inner carinae subparallel to outer, distinct, nearer to the outer carinae than to the middle of face, surface of face finely rugose.

Head and thorax stramineous or greenish, face speckled all over with small brown markings, clypeus brown over middle, pronotum with brown speckles, hind femora shiny brown, abdomen greenish, pygofer brown. Tegmina greenish brown with a hyaline patch across middle, the border of the hyaline patch being dark brown, whitish speckles in the cells, plainest on hyaline area; wings hyaline, slightly fuscous, veins brownish.

Genital styles slightly convex on inner edge, nearly straight on outer edge, broadest before middle, apex narrow, truncate, with the outer corner produced and slightly curved. Anal segment short, broad, in profile the ventral margin emarginate, apex rounded in middle, thus making five round projections, one apical and two on each side. The aedeagus is complex (fig. 17). It consists of a tube divided at the apex into two lobes (b) and having a small central lobe (a) on which the gonopore or opening of the ejaculatory duct is situated. Surrounding this is a large, complex organ forming a tube at the base and dividing into several free appendages at the apex. Ventrally there is a narrow projection (c) furcate at its apex, then a broader lobe divided into two (d) at its apex, these lobes bear a smaller projection at the side, from each side of the middle of this lobe, basad of the furcation, arises a long, slender, pointed process (e), still basad of these and near the base of *c* there is a semi-circular appendage (f) on each side, joined to the main body at its middle. From the dorsal side arises a broad plate divided into a pair of pointed lobes (g) and a median lobe (h). From near the point where the trifurcation takes place arises a pair of curved processes (i), and basad of these a pair of strong, pointed processes (k).

It is impossible to homologize these processes at the present time and useless to name them.

Female. Length 5 mm., tegmen 5.7 mm. In profile abdomen concave at base, convex and rounded at apex with the last visible tergite overlapping the greater portion of anal segment; anal segment curved to a point at apex; pregenital plate with hind margin sinuate in middle.

Color similar to male, but the hyaline spot and its border not so evident.

Described from fourteen males and six females from

Tutuila, from 900 to 1200 feet elevation (*Kellers*, April, June, July, 1918). Type No. 1021.

Capelopterus fuscifrons sp. n.

Male. Length 3.8 mm., tegmen 4.6 mm. Face longer than broad (1 to 1.3). Face and clypeus brown with a few light specks between outer carinae of face; vertex and nota light brown or stramineous speckled with brown, abdomen brownish; front and middle femora and tibiae brown, hind femora and basal half of tibiae brown. Tegmina similar to *C. maculifrons* but more brownish.

Genitalia on the same plan as *C. maculifrons* but with distinct differences. The fork at apex of *c* is longer, the large spines on *d* stouter, the apices of *d* more acute, the spine *i* sinuate and small at base and flattened at apex. The two species are closely related but specifically distinct.

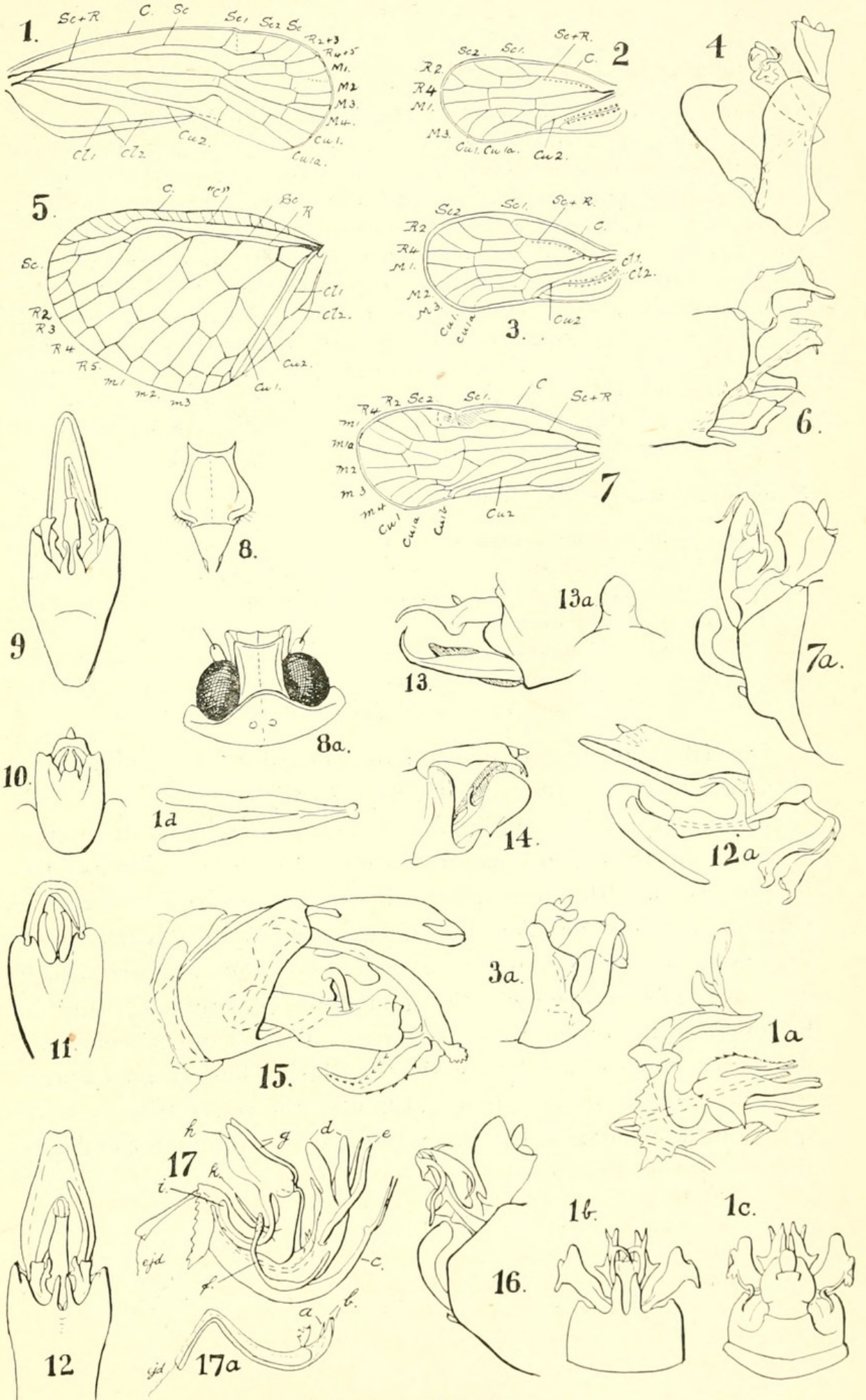
Female. Length 4 mm., tegmen 5 mm. Similar in color to male, but the hyaline spot and dark border very obscure.

Described from two males and two females from Niue or Savage Island (*Kellers*, August, 1918). Type No. 1022.

PLATE X.

DESCRIPTION OF FIGURES.

1. *Eurynomeus granulatus*, right tegmen; 1a, aedeagus and anal segment, lateral view; 1b, male genitalia ventral view; 1c male genitalia dorsal view; 1d penis.
2. *Meenoplus atrovenosus*, left tegmen.
3. *Meenoplus langleyi*, left tegmen; 3a male genitalia lateral view.
4. *Plestia kellersi*, male genitalia lateral view.
5. *Plestia anomala*, left tegmen; "c" costal vein; c costal margin.
6. *Myndus roggeweyni*, male genitalia lateral view.
7. *Austroloma baumanensis*, left tegmen; 7a male genitalia lateral view.
8. *Neolollius viridis*, face; 8a vertex and pronotum.
9. *Ugyops kellersi*, male genitalia ventral view.
10. *Ugyops samoensis*, male genitalia ventral view.
11. *Ugyops brevipennis*, male genitalia ventral view.
12. *Ugyops bougainvillei*, male genitalia ventral view.
13. *Lamenia caliginea*, male genitalia lateral view; 13a subgenital plate of female.
14. *Phaciocephalus tutuila*, male genitalia lateral view.
15. *Vanua angusta*, male genitalia latero-ventral view.
16. *Austroloma wilkesi*, male genitalia lateral view.
17. *Capelopterus maculifrons*, aedeagus lateral view; 17a penis, lateral view.



Samoan Fulgorids.

Neolollius gen. n.

Vertex square, the length in middle equal to width, apex and base slightly concave; lateral carinae deep, those of apex and base small, a small line but no carina down the middle; the face between the medio-lateral carinae projecting beyond the vertex; face narrowest at base, apical half roundly and broadly produced, side distinctly carinate, the inner carinae near to the outer but distinctly raised above them especially basally, face between inner carinae excavate, no median carina; antennae small, globose, eyes without antennal emargination; pronotum with two small depressions near the middle; abdomen compressed; hind tibiae with two spines. Venation as in *Lollius* Stal, the apical margins of the tegmina truncate. This genus is a modification of *Lollius*, the face is broader than long and in dorsal view there is a distinct break between the square vertex and the produced face.

Neolollius viridis sp. n. Figs. 8, 8a.

Male. Length 6 mm., tegmen 6.6 mm. Light green; head, pronotum and legs speckled with small, brownish marks, abdomen brownish below; tegmina with a few small, brown spots on hind margin and some faint whitish ones scattered over the cells.

Genital styles triangular, flattish, the acute apex turned in at right angles; anal segment narrow, concave on ventral side, apex rounded, anus about one-third from apex; aedeagus not dissected out.

Described from two males from Tutuila, 900 to 1200 feet elevation (*Kellers*, June 30, 1918). Type No. 1023.

So far as my present knowledge goes there is a distinction between the male genitalia of Flatidae, Ricaniidae and Issidae. In the Issidae the aedeagus consists of a large outer tube with or without complex appendages and a very small inner tube without any complex appendages, and a fairly large penis or lobe on which the gonopore is situated. In the Ricaniidae the outer tube is large and has no appendages, the inner tube small but with two large lateral appendages and the penis is small. In the Flatidae the outer tube is small with long appendages, the inner tube large without appendages, and the penis is small.



Muir, F. 1921. "On some Samoan fulgorids (Homoptera)." *Proceedings of the Hawaiian Entomological Society* 4, 564–584.

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