

# New Hawaiian Delphacidae

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**New Hawaiian Delphacidae.**

BY F. MUIR.

(Read December 14, 1916.\*)

During the last twelve months considerable additions have been made to our Delphacid collections, several new species have been captured and our knowledge of the food-plants of many species has been corrected or extended. This has been chiefly due to the energy of Messrs. P. H. Timberlake, O. H. Swezey and W. M. Giffard. Mr. Giffard has also procured a small but interesting collection from the Island of Lanai. This collection was made by Mr. G. C. Munro with the assistance of H. Gibson and it brings the number of species known from that island up to fifteen, and places it third on the list. This indicates that the number of species still unknown from the three larger islands of Kauai, Molokai and Maui is very great.

The new species show the same degree of phallic differentiation as do species previously described, in some cases they are closely related to known forms but in others they appear to be quite isolated. The Hawaiian species of *Kelisia* have been considered as foreign; the four species belong to three distinct types which, without intermediate forms, cannot be conceived as having any relationship. Two species, *K. sporobolicola* and *K. swezeyi*, are closely related, and it is probable that one is of local origin.†. Elsewhere‡ I have put forward the suggestion that this phallic differentiation represents a differentiation of the germ-plasm and, although I have given the subject considerable thought, I can offer no better reason. I believe that one of the first steps in species formation among Hawaiian Delphacidae is a change of food-plant. In many cases this will lead to isolation and may eventually lead to differentiation of the germ-plasm. Mr. W. M. Giffard brought to my notice the fact that certain species feeding upon more than one food-

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\* The captures, etc., have been brought up to date (February, 1917).

† Since this was written, *K. paludum* Kirk. has been found to have a wide range in the Pacific.

‡ Pro. Haw. Ent. Soc. III, 1916, p. 210.

Proc. Haw. Ent. Soc. III, No. 4, May, 1917.

plant have two or more forms. At Kilauea, Hawaii, *Nesosydne ipomoeicola* is very common on *Lythrum maritimum* H. B. K. and *Sadleria* sp.; specimens from the former plant are on the average much darker than specimens from the latter. In the same locality *N. blackburni* from *Clermontia parviflora* and *Stenogyne* has a distinct green tint when alive which is absent from specimens off of *Pipturus*.

During a recent trip to Kilauea, Hawaii, along with Mr. W. M. Giffard, we hatched out several hundred nymphs of *Nesosydne koae* Kirk. without getting a single egg parasite. We also found evidence that indicated that *N. koae* only oviposits in the young shoots bearing leaves and *N. rubescens* only in the edges of the leaves and phyllodia. Mr. Swezey took the eggs of *N. koae-phyllodii* in the edges of phyllodia. The ovipositor of *N. koae* and *N. rubescens* are quite distinct, the former being smaller, very slightly curved, with about 25-30 fine teeth along the dorso-apical half, the latter is larger, stouter, slightly curved and recurved, with about the same number of larger, square teeth along the dorso-apical half. The ovipositor of *N. rubescens* var. *pulla* is similar to that of the species.

The types of the new species described in this paper, as well as those described in a previous paper,\* have been deposited in the collection of the Hawaiian Sugar Planters' Association in Honolulu, T. H.

#### GENUS LEIALOHA Kirk.

*L. lehuae lanaiensis* subsp. nov. Pl. V, fig. 1.

♂ Dark brown, antennae, legs and base of abdomen lighter. Tegmina dark fuscous, more intensely so down the middle; apical two-thirds of costal cell (except a dark spot about one-fourth from apex), subcostal cell and a mark in first two apical cells nearly colorless; the clavus, a spot at fork of cubital veins and over the fifth and sixth apical cells lightly fuscous; veins concolorous with membrane, beset with very minute dark granules; wings light fuscous, veins darker.

The genitalia are near to those of the subspecies *kauaiensis*, the crook at apex of aedeagus large, with its apex curved outward.

Length 2.5 mm.; tegmen 3.6 mm.

Hab. Lanai, Kaiholena (G. C. Munro, November, 1916.) This sub-species is closely related to *L. lehuae kauaiensis*.

\* Pro. Haw. Ent. Soc. III, pp. 168-221, 1916.



*L. lehuae oahuensis* Muir.

A long series from various localities from Lanai (Munro, December, 1916). These show the same amount of variation as specimens from Oahu, including the immaculate red female which possibly may be a female form of *L. lehuae lanaiensis*. There is also a form in which the marking in the middle of the tegmen is much more extensive and considerably tinged with reddish brown. Some of these specimens may belong to *L. ohiae* Kirk. as I believe that the division between *L. ohiae* and *L. lehuae* is arbitrary.

*L. lehuae hawaiiensis* Muir.

Many specimens off *Metrosideros collina polymorpha*, also some nymphs bred to maturity on *Straussia* sp. Kilauea, Hawaii (Giffard and Muir, January, 1917).

## GENUS NESODRYAS Kirk.

*N. antidesmae* sp. nov. Pl. V, Fig. 2, 2a.

♂ Slender, as in the typical subgenus. Head and legs white or pale yellow; face and genae between eyes, first segment of antennae and a longitudinal line on second segment black or dark brown, a spot on front coxae and a band at the apex of femora and base of tibiae of middle and hind legs black or dark brown; thorax and abdomen yellow, pronotum lighter than mesonotum, dorsum of abdomen and the pygophor fuscous. Tegmina hyaline, yellowish or light brown at base of clavus and from base of costal cell across to hind margin near apex of clavus, where the otherwise white dorsum is dark brown, veins light except the apical halves of median and cubital veins which are broadly fuscous; margins of apical half of tegmina also fuscous; wings hyaline with light veins.

Pygophor similar in shape to *N. cleocarpae*; anal segment with a pair of stout spines slightly curved and compressed laterally; genital styles similar to *N. eugeniae*; aedeagus straight, cylindrical, slightly larger at base than at apex, apex with a large curved crook on right side and a smaller one on left, a nearly straight spine on ventral side a little before the apex.

Length 2.2 mm.; tegmen 3 mm.

♀ Similar to male; ovipositor dark brown and the pygophor on each side fuscous.

Hab. Nuuanu Pali, Oahu (Giffard and Fullaway, November, 1916), six specimens off *Antidesma platyphyllum*.

This species comes next to *N. eugeniae* but is quite distinct, especially in coloration.

*N. eugeniae* Kirk. Pl. V, fig. 5, 5a.

Four specimens from Kaiholena and Kapano, Lanai (Munro, December). In coloration these conform to *N. eugeniae* of Oahu but the genitalia approaches to those of *N. giffardi*; certain specimens of the latter species from Waiahole, Oahu, have the genitalia approaching to *N. eugeniae* and they both approach to *N. eleaocarpi*. The three species are nearly related and best separated on color.

*N. (Nesothoe) dryope* (Kirk.)

A series of males and females off *Antidesma platyphyllum* beside the government road Kau, Hawaii, near the Kona boundary. (Giffard and Muir, January, 1917).

*N. (Nesothoe) gulicki* Muir.

A series of males and females, but no young, off of *Metrosideros polymorpha* Gaud. on the edge of the lava flow near Waiamau, Hawaii, and one nymph bred to maturity off of *Osmanthus sandwicensis*. (Giffard and Muir, January, 1917.)

*N. (Nesothoe) terryi* (Kirk.). Pl. V, fig. 3.

Two females, one male and a nymph which I consider to be this species, from Waialae Nui, Oahu, (Swezey, April, 1916,) off *Osmanthus sandwicensis* (Gray). The type locality is Waialua, Oahu.

Anal segment with short flattened spines with wide base; genital styles with basal half straight and apical half curved; aedeagus long, thin, tubular, apex pointed, a curved spine from right side, about one-third from apex.

This species comes next to *N. bobae* (Kirk.).

*N. (Nesothoe) piilani* (Kirk.). Pl. V, fig. 4.

♂ Vertex, face and genae between eyes and clypeus brown, vertex and genae speckled with light brown, face and genae below eyes sordid creamy white with dirty spots; antennae light brown; pronotum light mottled brown, darker brown on lateral areas and on pleura; mesonotum dark brown between carinae, light brown on



sides; legs yellowish or light brown, fuscous at apex of femora and base of tibiae; abdominal tergites and phygophor brown, sternites dirty white. Tegmina slightly opaque, milky, veins light with distinct dark brown granules somewhat irregular on apical portion, a fuscous band from costal margin near base to junction of claval veins and then to beyond middle of claval margin where there is a darker mark, the basal border of the band fairly well defined but the apical border fading out irregularly; a dark mark at contact between radius and media, and from median cross-vein to apex, more or less indefinite; wings whitish with light veins. The opaque, milky appearance of tegmina and wings due to a waxy secretion and can be removed with chloroform.

Length 3 mm.; tegmen 3.4 mm.

♀ Lighter in color than the male. The band across tegmen is sometimes nearly obsolete, even in males, and the mesonotum between the carinae hardly darker than the sides.

Hab. Kaiholena, Lanai (G. C. Munro, December, 1916), off *Osmanthus sandwicensis* (Gray).

This species was originally described from one female in bad condition from Molokai. The present specimens appear to me to be more distinctly marked and may prove to be distinct, but until male specimens from Molokai can be procured and the genitalia examined I consider it better to place them under the same name. This species comes near to *N. terryi* and *N. bobae*.

*N. (Nesothoe) maculata* Muir.

One female specimen from Kaiholena, Lanai (Munro, December, 1916). Hitherto only known from Hawaii. Common on luma (*Maba sandwicensis* D. C.) along the government road between Kahuku ranch and Kona boundary. Nymphs also bred to maturity on leaves of *Osmanthus sandwicensis*. (Giffard and Muir, January, 1917.)

*N. (Nesothoe) fletus* (Kirk.).

A series of both sexes from Kaiholena, Lanai, off of *Suttonia* (Munro, December, 1916). Hitherto only known from Maui. In coloration darker and more fuscous than from the type locality. The aedeagus is more acute at apex and the spine at side has a few minute teeth.

*N. (Nesothoe) munroi* sp. nov. Pl. V, fig. 6.

♂ Face banded black and creamy white; the face and genae between eyes, a band across face and genae one-fourth from apex and a fine line at extreme apex black or dark, shiny brown, the intervening areas creamy white; clypeus fuscous; vertex, pronotum and mesonotum mottled brown, darkest laterad of carinae; antennae black; legs light brown with darker longitudinal markings; abdomen fuscous, lighter on base and on pleura. Tegmina slightly opaque and milky, a sinuous black or dark brown longitudinal mark from base to apex, covering base of clavus, curving to near middle of costa and then toward apex of clavus, irregularly fuscous over base of radius, media and cubitus; veins in base of clavus light with light granules, otherwise veins dark with dark granules irregularly scattered; wings hyaline, slightly fuscous, with brown veins. Anal spines short, flat, broad at base; aedeagus figured.

Length 2.5 mm.; tegmen 3 mm.

♀ Similar to male in coloration; ovipositor dark.

Length 3.7 mm.; tegmen 3.9 mm.

Hab. Lanai 2,000 feet (Munro, December, 1916) on *Dodonaea viscosa* L. (aalii). The nymphs are characterized by the black and white banded face. The aedeagus is a modification of that of *N. dryope*.

Genus ALOHA Kirkaldy.

*A. campylothecae* Muir.

*A. kaalensis* Muir. Pro. Haw. Ent. Soc. 1916, p. 183. A long series taken by Mr. Timberlake (July, 1916,) shows that there is no good distinction between these two species and so the latter must be sunk.

*A. myoporicola* Kirk.

Taken on *Pelea volcanica*, Kilauea, Hawaii, adults and nymphs. (Giffard and Muir, January, 1916.)

*A. swezeyi* Muir.

One male and several females, one of the latter being macropterous, taken on Mount Tantalus off *Campylotheca macrocarpa* (Timberlake, February, 1917). They are of a more uniform brown than the type. One male specimen from Kuliouou, Oahu, off *Lythrum* (Swezey, June, 1916).



## GENUS NOTHORESTIAS nov.

This genus differs from *Nesorestias* Kirk. by having a single median frontal carina, either simple or furcate. It stands in the same relation to *Nesorestias* Kirk. as *Nesodryas* Kirk. and *Nesosydne* Kirk. do to *Leialoha* Kirk. and *Aloha* Kirk.

*N. badia* sp. nov. Pl. V, fig. 9.

♂ Antennae reaching to middle of clypeus, first segment more than half the length of second; frontal carina furcate from middle, the two carinae on basal half being near together. Tegmina not reaching to middle of abdomen, reticulate and coriaceous.

Body and tegmina dark brown, darkest over frons and first and second coxae.

Anal segment without spines; genital styles similar to *Aloha ipomoeae* Kirk. but with the "toe" and "heel" more rounded; aedeagus near to that of *Nesorestias filicicola* Kirk., but with the dorso-basal knob reduced to a blunt point, the cock's comb reduced to minute teeth, the spine on right side near apex large, with its apex bent at right angle, the spine on left side stout.

Length 2.5 mm.; tegmen 1 mm.

Hab. Kuliouou, Oahu. (Timberlake, June, 1916.) One specimen swept from ferns.

A female specimen (Swezey, September, 1908,) from Nāhiku, Maui, has a simple median frontal carina and forms a second species in this genus.

## GENUS NESOSYDNE Kirk.

*N. pele* Kirk.

Nymphs on *Straussia* sp. bred to maturity.

*N. timberlakei* sp. nov. Pl. V, fig. 14.

♂ Brachypterous, tegmina not reaching to base of pygophor; antennae reaching beyond middle of clypeus, second segment slightly longer than first; frontal carina furcating about one-third from base.

Light brown, darker on head and thorax between carinae and over lateral and posterior portions of abdominal tergites. Tegmina hyaline, light brown, a dark mark at end of costal cell and another at end of cubitus, veins slightly darker with small granules bearing hairs. Anal segment without spines; genital styles curved, slightly flattened, broad at base and narrowing to rounded apex; aedeagus curved dorsad, apex rounded, a row of teeth over apex and along dorso-apical half, four teeth on right side, from the medio-ventral fourth there arises a thin, curved plate with serrated edge.



Length 3.4 mm.; tegmen 2.3mm.

Hab. Oahu, Waiahole. (Timberlake, August, 1916), one male off *Cyrtandra garnotiana*. This species is very distinct but appears to be a development of *N. cyrtandrae* Muir.

*N. gunnerae* sp. nov. Pl. V, fig. 15.

♂ Brachypterous, tegmina reaching nearly to apex of abdomen; antennae reaching to about middle of clypeus, first segment more than half the length of second; furcation of frontal carina indefinite, about the middle of face.

Light brown or yellowish brown, darker between carinae of head and thorax; front legs with dark tarsi; abdomen dark except the base, an indefinite mark down middle of dorsum and the lateral edges of abdomen lighter. Tegmina hyaline, light brown, veins with minute granules bearing small black hairs, veins dark over the middle third, a small dark mark at apex of costal cell and another at the apex of cubitus, the membrane over middle third slightly infuscate. There is considerable variation in coloration, some specimens having the dark areas on tegmina and body more intense and more extensive.

Width of pygophor about equal to depth, ventro-lateral edges produced into rounded process, medio-ventral edge with a minute spine; anal segment short, without spines, medio-apical edge labiate; styles small, narrowing to apex, slightly curved and converging at apex; aedeagus short, slightly flattened laterally, base deep with the stem very strongly curved, apex rounded, orifice on dorsal side near apex, some minute teeth along dorsal surface.

Length 3 mm.; tegmen 2.3 mm.

♀ Similar to male but generally lighter in color.

Length 3 mm.; tegmen 2.3 mm.

Hab. Oahu, Mount Kaala, about 4,000 feet elevation. (Timberlake, July, 1916). A long series of both sexes and one nymph off *Gunnera petaloidea* Gaud., mostly along the midrib on the under side of old leaves. A male and female on *Pelea* sp., one female on *Coprosma longifolia* Gray, and one female on *Suttonia*.

This species comes next to *N. perkinsi* Muir from Maui.

*N. nesogunnerae* sp. nov. Pl. V, figs. 16, 16a.

♂ Brachypterous; antennae reaching to middle of clypeus or beyond, second joint double as long as the first; medio-frontal carina furcating about middle; vertex longer than broad; first joint of hind tarsus slightly longer than other two together; spur with sixteen teeth on hind edge.

Blackish brown, carinae of head slightly lighter; pleura, legs, base and a medio-dorsal line of abdomen lighter. Tegmina hyaline, ochra-

ceous-tawny, blackish at end of clavus especially so on margin and vein, veins thick, concolorous with membrane, no distinct granules but sparsely beset with black hairs.

Pygophor about as wide as deep; anal spines large, cultrate, slightly diverging; genital styles small, broadest at base and apex, apex truncate with the inner corner slightly produced; aedeagus short, deep, compressed laterally, with a deep emargination about middle of ventral edge, some five or six spines on left side near apex and a longer row on right.

Length 2.9 mm.; tegmen 2 mm.

♀ The female I associate with this species is tawny brown instead of blackish brown, it has sixteen teeth on the tibial spur.

Length 3.9 mm.; tegmen 2.5 mm.

Hab. Lanai, Lanaihale, 3,000 feet elevation (Munro, December, 1916). This species comes between *N. perkinsi* and *N. gunnerae*.

*N. disjuncta* sp. nov. Pl. V, figs. 12, 12a.

♂ Brachypterous; antennae reaching to middle of clypeus, proportional length of first and second joints as 1 to 1.7; medio-frontal carina furcate at extreme base; vertex longer than broad; first joint of hind tarsi longer than other two together, spur about  $\frac{3}{4}$  the length of first tarsal joint.

Head and thorax between carinae dark brown or black, carinae, antennae, lateral margins of pronotum light brown or yellow; legs light brown with longitudinal brown mark on femora; abdomen dark brown with lighter markings on base and in medio-dorsal line near apex. Tegmina hyaline slightly tinged with yellow, lightly fuscous from near base of costal cell to apex of clavus, where there is a dark-brown mark, also a dark mark at apex of costal cell, veins concolorous with membrane with a few minute granules bearing black hairs.

Genitalia as figured. The aedeagus slightly curved with a flange along each side with the edges deeply serrated.

Length 3.7 mm.; tegmen 2.2 mm.

♀ The female I associate with this is slightly lighter in color over the lateral portions of notum and the infuscation from base of costal cell to apex of clavus is very faint. Proportional length of first and second antennal joint as 1 to 2.3.

Length 3 mm.; tegmen 2.3.

Hab. Lanai, male from north end of highest ridge, 3,000 feet, female from Lanaihale, 2,000 feet. This is an isolated species; for the present I shall place it next to *N. perkinsi*.

*N. lobeliae* Muir.

Aedeagus and genital style figured, Pl. V, figs. 7, 7a.



*N. asteliae* sp. nov. Pl. V, fig. 13.

♂ Brachypterous, tegmen not reaching to the base of the pygophor; antennae reaching to the middle of clypeus, first segment more than half the length of second; furcation of frontal carina about one-third from base.

Pale yellow, fuscous between carinae of face and clypeus, over lateral portion of abdominal tergites and on hind femora. Tegmina hyaline, fuscous over the middle half. There is considerable variation of color in this species, the abdomen in some specimens being nearly all fuscous and the thorax between carinae, especially of the mesothorax, being fuscous; the tegmina also are nearly black in some and in others the dark marking is confined to a mark at apex of clavus and another at apex of costal cell.

Pygophor about as broad as deep, ventro-lateral edges produced in rounded processes, medio-ventral area bearing a small, blunt spine; anal segment bearing two large, flattened spines slightly sinuous and diverging; genital styles small, slightly curved and slightly narrowed at truncate apex. Aedeagus figured.

Length 3.2 mm.; tegmen 1.8 mm.

♀ Lighter in color, some specimens being almost immaculate; but there is a similar degree of variation as in the male.

Length 3.2 mm.; tegmen 2 mm.

Hab. Oahu, Mt. Kaala (Timberlake, July, 1916), 4,000 feet elevation; a series of males, females and nymphs off *Astelia veratroides* Gaud. This species is very distinct. I consider that it comes next to *N. sharpi* Muir.

*N. sola* sp. nov. Pl. V, figs. 11, 11a.

♂ Brachypterous, tegmina not quite reaching base of pygophor; antennae reaching to middle of clypeus, first segment more than half the length of second; furcation of frontal carina about middle, the two carinae on basal half being near together and appearing as a single thick carina.

Castaneous, fuscous over lateral portions of abdominal tergites. Tegmina light castaneous, a small fuscous mark at apex of costal cell and another at apex of clavus.

Pygophor deeper than wide, medio-ventral edge produced into a point, medio-lateral edges roundly excavate; anal segment prolonged on ventral edge where it is sublabiante, no anal spines; styles very small, slightly curved, apices subacute; aedeagus large, long, tubular, slightly curved, ventral edge of apex produced into two spines, the left larger than the right, dorsal part of apex flattened vertically, a few small spines near apex on ventral side and a couple on right side.

Length 3.2 mm.; tegmen 2.2 mm.

♀ Unknown.

Hab. Oahu, Punaluu (Swezey, June, 1911). This species is very distinct, the aedeagus not being closely related to any of the described species. Along with *N. palustris* it shares the distinction of having the ventral edge of the pygophor produced into a large spine.

*N. koebelei* sp. nov. Pl. V, figs. 10, 10a.

♂ Brachypterous, tegmina reaching to base of pygophor; antennae reaching beyond middle of clypeus, first segment nearly equal to second in length; frontal carina simple.

Stramineous, fuscous between carinae of head and thorax, and over the sides of abdominal tergites. Tegmina stramineous, veins slightly fuscous, a dark mark at apex of clavus and another at apex of costal cell.

Pygophor wider than deep; anal segment with two short, broad spines, their bases approximate and apices diverging; genital styles broad at base, curved, narrow on apical third, the apices curved and truncate; aedeagus short, flattened laterally, apex subcrassate and bent to the left.

Length 3.6 mm.; tegmen 2 mm.

Hab. Oahu, Punaluu (Swezey, June, 1911). This species is very distinct, but I place it in the vicinity of *N. sharpi*. I name it after Mr. A. Koebele, whose associations with entomological work of our island is well known to local entomologists.

*N. blackburni* Muir.

One male taken at Punaluu, Oahu, by Swezey (June, 1911). Previously known only from Hawaii.

*N. nephelias* Kirk. Pl. V, fig. 8.

One male specimen from Lanai, Halelepaakai (Perkins, No. 134, July, 1894), which differs from the description by having the carinae of the same color as the rest of the head and thorax, the femora not striped and the two fuscous marks on tegmina more extensive. The genitalia come near to those of *N. anceps* and *N. swezeyi*.

*N. nigriceps* sp. nov. Pl. VI, figs. 33, 33a.

♂ Brachypterous; vertex longer than wide, slightly rounded at apex; antennae reaching beyond middle of clypeus, first joint to second as 1 to 1.7; lateral pronotal carinae straight, diverging posteriorly, reaching hind margin; frontal carina forking near base.



Head, pro- and mesothorax and front and middle coxae black, antennae, carinae of clypeus, metathorax and legs ochraceous, a round black spot on metapleura; abdomen black, base, on pleura and a median mark on the hind margin of each tergite yellow. Tegmina ochraceous, a black mark over apex of costal cell and a larger one over middle of tegmen reaching to hind margin at apex of clavus, veins concolorous with membrane, without granules. Genitalia figured.

Length 2.6 mm.; tegmen 2 mm.

♀ There is one specimen which may be the female of this species but the thorax and carinae of head are ochraceous and the black in middle of tegmen not so extensive.

Length 3.1 mm.; tegmen 2.3 mm.

Hab. Lanai, 2,300 feet elevation (Munro, February, 1917). This species comes next to *N. anceps* Muir, but it also shows affinities with *Aloha ipomoeae* Kirk. and *A. myoporica* Kirk.

*N. fullawayi lanaiensis* subsp. nov.

The genitalia of this sub-species are similar to those of *N. cyathodis* and *N. fullawayi*. In coloration it is nearer to the latter, but uniformly darker. The tegmina are slightly opaque and milky white with brown veins and granules.

Length 1.7 mm.; tegmen 1 mm.

Hab. Waiopaa, Kaiholena, Lanai (Munro, December, 1916), off *Cyathodes*.

*N. raillardiae* Kirk.

Numerous on *Raillardia* along government road some three miles from Volcano House, Kilauea. One macropterous female among them. (Giffard and Muir, January, 1917.)

*N. hamata* sp. nov. Pl. V, figs. 17, 17a.

♂ Brachypterous; vertex longer than wide, medio-frontal carina simple but thick at base; antennae reaching to about middle of clypeus, first joint half the length of second; tibial spur with ten, teeth.

Light ochraceous-buff; between carinae of head and thorax fuscous black; a spot on pleura and a longitudinal mark on femora dark; abdominal segments with darker markings over the lateral areas. Tegmina light ochraceous-buff, a fuscous mark at end of costal cell and another at end of clavus; veins concolorous with membrane; a few minute granules bearing hairs.

Pygophor a little deeper than broad, medio-ventral and lateral edges without projections; anal spines large, bases near together,

slightly diverging towards apex; aedeagus small, with a large barb at the apex; genital styles small, slightly narrowed in middle, apex obliquely truncate, inner corner slightly produced.

Length 2.3 mm.; tegmen 1.5 mm.

♀ The female I associate with this male is similar in color.

Length 3 mm.; tegmen 2.3 mm.

Hab. Lanai, north end of highest ridge, 3,000 feet elevation. This species is isolated; it may come near to *N. palustris* Kirk. of which I have only seen a female.

#### Genus KELISIA Fieber.

The four species of this genus recorded from the archipelago have the face slightly broader and the sides more arcuate than in the type species. The endemism of these insects is doubtful.

#### *K. sporobolicola* Kirk. Pl. V, figs. 21, 21a.

Anal segment sunk into dorsal edge of pygophor, spines on ventro-lateral edges large, thick, with blunt apices; genital styles "leg-of-mutton" shape with blunt apex (viewed in situ they appear much more slender; the figure is from specimen mounted in balsam); aedeagus long, thin, tubular, apex acute, orifice on ventral side one-third from apex; from a dorso-median position arises a small serrated crest.

#### *K. swezeyi* Kirk. Pl. V, figs. 20, 20a.

Genitalia similar to *K. sporobolicola* Kirk. but the aedeagus more slender, orifice nearer to apex, the dorsal crest replaced by a few teeth, and the genital styles more slender.

Female similar to male, with two distinct black marks on the abdomen, one on each side of the ovipositor near the apex, ovipositor brown.

The type locality is Kalihi, Oahu (Swezey, March, 1906), but recently it has been taken at Nuuanu Pali (Timberlake and Swezey, October, 1916) (Giffard, November, 1916), off *Eragrostis variabilis* Gaud.

#### *K. paludum* Kirk. Pl. V, figs. 18, 18a.

Pygophor deeply emarginate on dorsal edge where anal segment is sunk into pygophor; anal spines acute; genital styles short, widest at apex and base, apex truncate; aedeagus small, tubular, basal half larger than apical half, dorsal surface of basal half corrugated. This is very distinct from the former species. Taken by Mr. Fullaway in Laysan Island.\*

\* Now known from several places in south and southeastern Pacific.



*K. emoloo* sp. nov. Pl. V, figs. 19, 19a.

Spur tectiform, hind margin with numerous small teeth. Tegmina not reaching to middle of abdomen.

♂ Light brown or stramineous; antennae dark with a longitudinal light mark, legs with longitudinal darker marks; fuscous over the lateral portions of abdominal tergites and sternites; genitalia dark brown. Tegmina stramineous, veins concolorous with membrane, a small dark spot at apex of clavus.

Pygophor subquadrate, lateral edges considerably produced; anal segment sunk into pygophor, each ventro-posterior corner produced into a strong spine with blunt apex; genital styles strongly diverging, strongly bent about middle; aedeagus straight, tubular, with apical portion strongly incrassate and beset with teeth.

Length 2.3 mm.; tegmen 1 mm.,

♀ Lighter in color, slightly infuscate between carinae of head and thorax; antennae light with two dark, longitudinal marks, longitudinal marks on legs more distinct; neuration of tegmina lighter than membrane; five more or less distinct light marks down dorsum of abdomen.

Length 3.3 mm.; tegmen 1 mm.

Hab. Oahu, Palolo Valley (Timberlake, July, 1916), Kuliouou (Swezey, June, 1916), off *Eragrostis variabilis* Gaud., which is called by the Hawaiians "emoloo".

### Homopterous Notes.

BY F. MUIR.

The material pertaining to these notes forms part of the material collected by members of the staff of the Hawaiian Sugar Planters' Experiment Station during the course of economic work in the Malay and Oriental regions, also material belonging to Prof. C. F. Baker of Los Banos, Luzon, P. I. The types of new species have been placed in the collection of the H. S. P. A. Experiment Station.

The interesting feature of this work has been the finding of several species so widely distributed. *Kelisia paludum* Kirk. hitherto only known from the Hawaiian archipelago is now known from several localities in the south, southwest and west Pacific. *Delphacodes anderida* (Kirk.), which is most likely the same as *Delphax sordescens* Motsch. from Ceylon, is now

\* Pro. Haw. Ent. Soc. III, pp. 168-221, 1916.

Proc. Haw. Ent. Soc. III, No. 4, May, 1917.