

## Fulgoroidea from the Cayman Islands and adjacent areas

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### Introduction

This report deals with a small collection of Fulgoroidea made with the use of light-traps by C. B. Lewis and G. H. Thompson during the Oxford University Biological Expedition to the Cayman Islands between 17 April and 26 August 1938. The material on which this study is based was presented by the Hope Department, Oxford, to the British Museum (Natural History) (B.M.(N.H.)) and now bears the Museum accession number B.M. 1967-147.

The present collection of Fulgoroidea is the first to have been made in the Cayman Islands, and in studying the species represented it was necessary to ascertain not only their identity but, if they were new, whether they were also endemic, and to what other species they were most nearly related. This requirement has made it necessary to take note of some hitherto undescribed species from the larger islands of the Greater Antilles. Some of these species were found in the accessions of the British Museum (Natural History), and others in a collection entrusted for study to the writer by Dr. J. Maldonado Capriles, Professor of Entomology at the University of Puerto Rico\*. The types of new species are in the collections from which they came.

The writer's thanks are tendered to Mr. J. P. Doncaster, formerly Keeper of the Department of Entomology at the Museum, and to Dr. Maldonado Capriles, for the privilege of examining the material in their charge.

Bibliographic references not listed at the end are to be found in *A bibliography of the Homoptera (Auchenorrhyncha)* by Z. P. Metcalf (1948, N.C. State College of Agriculture and Engineering, University of North Carolina).

### Zoogeography

The Cayman Islands lie between  $19^{\circ} 15'$  and  $19^{\circ} 45'$  N and  $79^{\circ} 44'$  and  $81^{\circ} 30'$  W, about 300 miles north-east of the nearest point in Central America, about 120 miles south of the mainland of Cuba, and 80 miles from its fringing islands, and about 130 miles west-north-west of Jamaica. They comprise three islands of unequal size, Grand Cayman, about twenty-two miles long and four to eight wide, Little Cayman, about nine miles long and one mile wide, and Cayman Brac, about ten miles long and one mile wide. The last two are separated by a channel seven miles wide, and Little Cayman, the nearer, is about 60 miles east of Grand Cayman.

The islands are of similar geological structure. The oldest formation is a massive limestone (Bluff Limestone) that forms flat low plateaus, though reaching a height of 140 ft in Cayman Brac. Around these are coastal plateaus ('Iron shores') consisting of consolidated sand and marl with pieces of coral. Along the coast, long narrow dunes have been formed by finely pulverized wind-blown sand and fragments of coral. A reddish soil, often in

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pockets and crevices in the underlying rock, has formed as a residue of erosion of the original surface of the Bluff Limestone. The natural vegetation comprises forest on the Bluff Limestone, buttonwood swamps, grass and reed swamps, mangroves, and coastal vegetation, the last being similar to that found elsewhere in the West Indies, and including such species as *Thespesia populnea*, *Coccoloba uvifera*, *Chrysobalanus icaco*, *Tournefortia gnaphalodes*, *Caesalpinia bonduc*, *Sporobolus virginicus*, *Cyperus* spp. and *Ipomoea* spp.

The genera of Fulgoroidea that are represented in the present collection indicate that they come from a fauna similar to that found in corresponding types of vegetation in other islands. Certain common elements in this fauna that were not taken by the Expedition, such as certain species of Delphacidae, and representatives of the Derbid genus *Cedusa*, of the Achilid *Catonia*, the Issids *Colpoptera* and *Thionia*, and of Flatine Flatidae, may well be found with further collecting.

The amount of difference that exists between 'corresponding' species in the Greater Antillean islands, as expressed by external and genitalic morphology, is frequently the same as between any one of them and their counterpart in the Cayman Islands, and, where this is so, it is justifiable to regard the latter as distinct and endemic species. Most of the Fulgoroidea of the Cayman Islands, in fact, belong to such species: there is, however, an interesting element that is unknown in any of the islands to the east, and includes a species of *Nymphocixia*, a Cixiid genus known so far in the Caribbean only from northern Colombia, Panama and Florida, and a species of Delphacid, described below as new, that has no West Indian counterpart and is nearest to a species in South America.

The collection studied is too small to serve as a basis for far-reaching conclusions. There are only few genera in which representatives are available from Grand Cayman and one or more of the other islands of the group, but the uniformity of their representative species, when compared with species outside the group, suggests that the Cayman Islands have a Fulgoroid fauna that is common to them all, and distinct from those of Cuba and Jamaica.

### Family CIXIIDAE

#### *BOTHRIOCERA* Burmeister

*Bothriocera* Burmeister, H. C. C., 1835. *Handb. Ent.* 2 (1) : 156.

Type species, *Bothriocera tinealis* Burmeister, 1835 : 156.

The bold pattern of dark markings to be found on the tegmina of most members of this genus was early adopted as a criterion for separation of species, and this has led to unrecognized species being referred to long-established species merely on account of general agreement in tegminal pattern. Such dispositions have produced a distributional picture for some species that is much too comprehensive.

In *Bothriocera* it would appear that a transverse carina that primitively lay close to the hind margin of the vertex has approached the margin so closely as to fuse with it at the middle, or over a greater part of its length, or even entirely. This has resulted in the presence or absence of a minute triangular aerolet at the posterolateral angles of the vertex, as found in Meenoplidae, and the shape of the aerolet appears to be comparatively uniform within members of a species as defined by male genitalic characters.

There are, in addition, constant differences to be found in the tegmina: these are usually small, and include the proportions of certain cells and the position of forks of the veins.

There are two species of *Bothriocera* in Grand Cayman, and these are described below as new: the opportunity is taken to discuss Greater Antillean species to which names have been applied at various times.

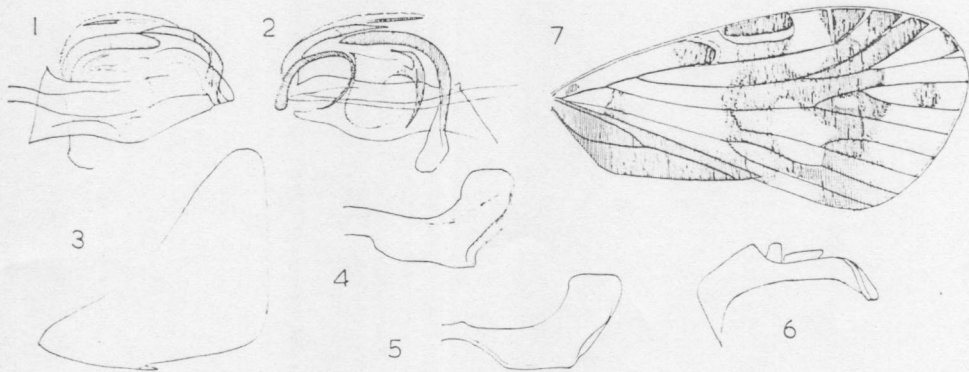
*Bothriocera pachyneura* sp. nov.

(Figs. 1-7)

♂♀. Vertex broader than long in middle (2.2 : 1), anterior margin convex, posterior margin straight, transverse, an elongate narrow triangular areolet at each posterolateral angle. Tegmina longer than broad (2.1 : 1), veins of Sc and R dilated on approaching margin, a submarginal rounded crater-like eminence in stigmal cell beyond stigma, and another, smaller, in third marginal cell; a slight eminence on M at nodal line of transverse veinlets. Post-tibiae with eight spines apically, basal metatarsal segment also with eight.

Light reddish brown; frons and vertex except near edges, and mesonotum, castaneus. Tegmina subhyaline; clavus, a spot at apex of costal cell, a broad band from stigma to apex of clavus, and a broader but less regular band distad of this, interrupted at middle by a pale ovate spot, and a spot in first apical cell of M, dark fuscous; veins in corium stramineous, except for Sc+R, which is pale reddish brown. Wings mostly infusate, a pale area near base and another between R and M distad of transverse veinlets.

♂. Anal segment of male elongate ovate, strongly deflexed in apical quarter, apical margin truncate. Pygofer in side view rounding approximately through 90 degrees. Aedeagus as figured, a deeply curved, slightly denticulate, spinose process on right at apex, a slender, needle-like process dorsally on flagellum, directed cephalad, a stouter weakly curved spinose process on flagellum curving to right and ventrad, and a stout curved rod traversing membrane of flagellum, which is unarmed at its apex. Genital styles as figured, apical margin rounded-truncate.



FIGS. 1-7. *Bothriocera pachyneura* sp. nov. (1) Aedeagus, left side; (2) aedeagus, right side; (3) pygofer, left side; (4) left genital style, slightly posterolateral view; (5) genital style, lateral view; (6) anal segment of male, left side; (7) tegmen.

♂: length, 3.5 mm, tegmen, 4.0 mm. ♀: length, 3.2 mm, tegmen, 4.0 mm. Holotype, ♂. CAYMAN IS.: Grand Cayman, west end, Georgetown, 27. iv. 1938 (*Lewis & Thompson*), in B.M.(N.H.).

Paratypes, 4♂, 2♀, Grand Cayman, north coast, north side, Hut Road, 17. vii. 1938; west end, Georgetown, 28, 29. iv. 1938 (*Lewis & Thompson*).

This species differs from the Central American *B. signoreti* Stål in tegminal markings and the apical dilation of the subcostal and radial veins.

*Bothriocera diploneura* sp. nov.

(Figs. 8-14)

*Bothriocera signoreti* Myers, J. G. 1928, *Studies on Cuban Insects*, 1928: 15.

♂♀. Vertex broader than long in middle (2:1), anterior margin subangulate or obtusely angulate, posterior margin shallowly concave, an elongate narrow triangular areolet at each posterolateral angle. Tegmina longer than broad (2.1:1), apical veins of Sc + R dilated, so strongly so near margin as to appear forked, a submarginal rounded eminence in stigmal cell beyond stigma, and another, smaller, in third marginal cell; a slight eminence on M at nodal line of transverse veinlets. Basal metatarsal segment with eight spines apically, second segment with two spines and seven scale-bearing teeth.

Light yellowish brown; frons, clypeus and vertex, except near margins and pleura, darker yellowish brown, mesonotum and abdomen dark reddish brown. Tegmina subhyaline; clavus, except basally between claval veins, a suffusion at base and spot at apex of costal cell, a broad band from stigma to apex of clavus, and a broader band, interrupted at middle by a pale ovate spot, and a spot in first apical cell of M, dark fuscous; veins in corium concolorous or dilute yellowish brown, except Sc + R and M, which are dark reddish brown. Wings mostly infusate, a pale area near base and another between R and M distad of transverse veinlets.

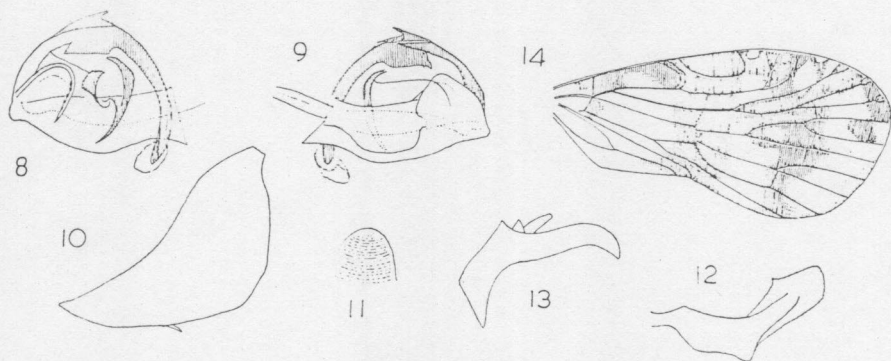
♂. Anal segment of male rather narrowly ovate, apically deflexed and shallowly trough-like, apical margin markedly convex. Pygofer in side view rounding approximately through ninety degrees. Aedeagus as figured, a deeply curved sparsely dentate spinose process on right at apex, a long stout curved rod supporting distal part of flagellum, and a broad scroll-like lobe below it, curved upward in a small fan-like lobe at one edge and produced in a moderately long spine on the opposite edge.

Genital styles as figured, apical margin obliquely truncate, inner apical angle angulate, and produced in a minute pointed process. ♂: length, 3.3 mm; tegmen, 4.1 mm. ♀: length, 3.5 mm, tegmen, 5.0 mm.

Holotype ♂. CUBA: Soledad, 2. iii. 1925 (*J. G. Myers*) in B.M.(N.H.).

Paratypes, 1♀, same data; 1♂, 25. ii. 1925 (*J. G. Myers*).

This species is close to *B. pachyneura*, but differs in the more angulate anterior margin of the vertex, the more explanate distal veins of Sc and R, the dark colour of vein M in the corium, and the pale spot in the basal part of the clavus. The two differ in the shape of the male anal segment. In the aedeagus, the fan-like lobe on the flagellum is represented only by a very narrow ridge in *B. pachyneura*. The genital styles have the apical margin much more oblique than in *pachyneura*, and the minutely pointed inner angle is also distinctive.



FIGS. 8-14. *Bothriocera diploneura* sp. nov. (8) Aedeagus, right side; (9) aedeagus, left side; (10) pygofer, left side; (11) apical part of male anal segment, dorsal view; (12) left genital style, lateral view; (13) anal segment of male, left side; (14) tegmen.

*Bothriocera cacus* sp. nov.

(Figs. 15-21)

♂♀. Vertex broader than long in middle (2 : 1), anterior margin obtusely angulate, posterior margin shallowly concave, a small triangular areolet, more than twice as long basally as high, at each posterolateral angle. Tegmina longer than broad (nearly 2 : 1), apical veins of Sc very slightly widening before apical margin, but almost negligibly so, no eminence at margin in stigmal cell distad of stigma, a slight eminence on M at nodal line of transverse veinlets. Basal metatarsal segment with eight teeth apically, second segment also with eight.

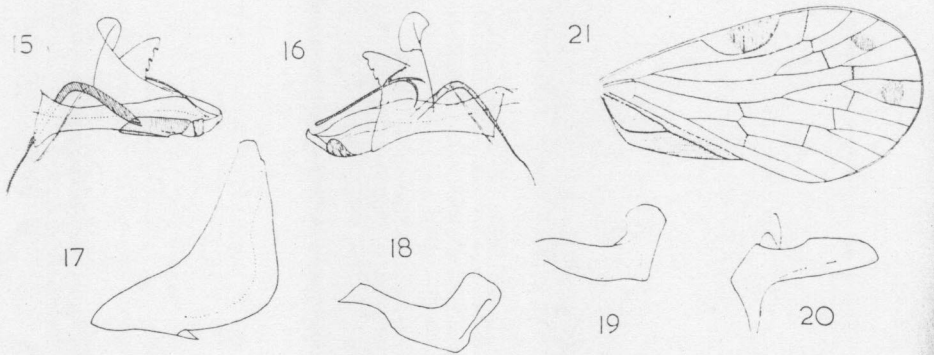
Tawny: intercarinal areas of base of frons except near margins, intercarinal areas of mesonotum, and abdomen, dark reddish brown. Tegmina greyish hyaline, a V-shaped spot extending mesad from stigma to R, clavus and all veins distad of nodal line of cross-veins, fuscous; Sc + R reddish brown in corium. Wings greyish hyaline with veins fuscous distad of R-M cross-vein.

♂. Anal segment of male longer than broad (1.7 : 1), bilaterally symmetrical, ovate, dorsal surface curving down distally to apical margin, which is rather deeply convex. Pygofer in side view subangulately rounding through about 105 degrees, medioventral process scarcely as long as broad at base, its distal margin deeply convex. Aedeagus as figured, a shallowly curved slender process, with three branches, on right at apex, a long rod, bent at middle through about 90 degrees, supporting distal part of flagellum, a thin subvertical triangular lobe, with about four coarse teeth on its posterior margin, on dorsal surface of flagellum, arising from a weakly sclerotised vertical triangular lobe that is twisted at its apex and expanded to form a fan-like plate. Genital styles as figured, apical margin in side view moderately convex, with distal angle broadly rounded, subequal to basal angle.

♂: length, 2.5 mm; tegmen, 3.2 mm. ♀: length, 2.8 mm; tegmen, 4.0 mm.

Holotype ♂. CAYMAN IS.: Grand Cayman, north coast, north side, Hut Road, 15. vii. 1938, light trap (*Lewis & Thompson*) in B.M.(X.H.).

Paratypes, 2♂, 6♀, CAYMAN IS.: Grand Cayman, west end, Georgetown, 9, 27. iv., 3. viii. 1938; north coast, north side, 11, 12, vii. 1938; north sound, Booby Cay, 6. v. 1938; south sound, 18. vi. 1938 (*Lewis & Thompson*).



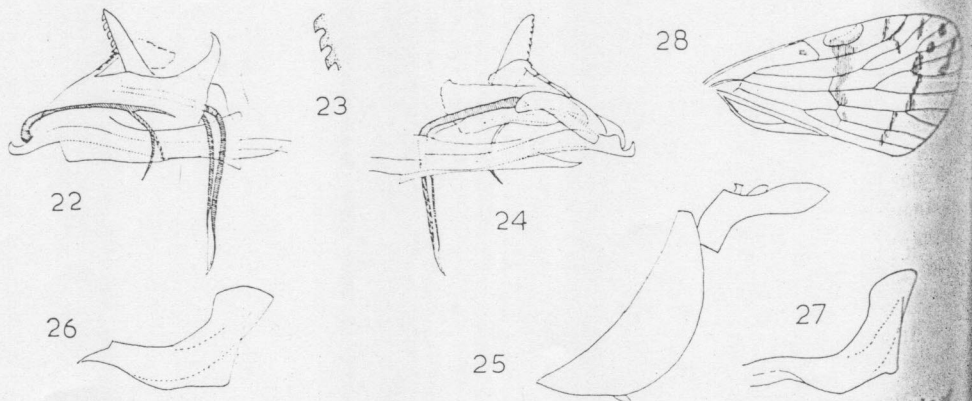
Figs. 15-21. *Bothriocera cacus* sp. nov. (15) Aedeagus, left side; (16) aedeagus, right side; (17) pygofer, left side; (18) genital style, lateral view; (19) left genital style, slightly posterolateral view; (20) anal segment of male, left side; (21) tegmen.

This species is distinguishable by the form of the anal segment, the shape of the pygofer in side view, and of the medioventral process in ventral view, by the details of aedeagal structure, by the shape of the genital styles, and by coloration. In the aedeagus the most distinctive feature is the combination on the flagellum of a triangular coarsely dentate lobe and a second triangular lobe that is twisted apically and expanded into a fan-like shape.

*Bothriocera lua* sp. nov.

(Figs. 22-28)

♂♀. Vertex broader than long in middle (2.1 : 1), anterior margin obtusely angulate, posterior margin almost transverse, a small triangular areolet, more than twice as long basally as high, at each posterolateral angle. Tegmina longer than broad (2.2 : 1), apical veins of Sc and R slightly dilated and impressed at junction with apical margin, no obvious eminence at margin in stigmal cell beyond stigma, a slight eminence on M at nodal line of transverse veinlets. Basal metatarsal segment with eight teeth apically, second segment with two spines and six teeth between them.



Figs. 22-28. *Bothriocera lua* sp. nov. (22) Aedeagus, right side; (23) marginal teeth on lobe of flagellum; (24) aedeagus, left side; (25) pygofer and anal segment, left side; (26) left genital style, lateral view; (27) left genital style, slightly posterolateral view; (28) tegmen.

Brownish yellow; frons, clypeus and vertex, except near margins, procoxae, mesocoxae and mesopleura, darker yellowish brown; mesonotum ferruginous or darker reddish brown; abdomen dark reddish brown. Tegmina milky-hyaline; a spot at apex of costal cell, a band, narrowing posteriorly, from stigma to fork of  $Cu_1$ , a suffusion over forks of R and  $M_{1+2}$ , and also over each transverse veinlet, a submarginal spot, perforated by three small translucent spots, in apical cells of R, a spot at middle of first apical cell of M, and a suffusion along commissural margin of clavus, fuscous, veins fuscous, except  $Cu_1$  in corium and claval veins, which are concolorous. Wings greyish hyaline, veins infusate, transverse veinlets broadly so.

♂. Anal segment of male bilaterally symmetrical, ovate, not quite twice as long as broad, dorsal surface curving down distally to apical margin, which is shallowly convex. Pygofer in side view broadly rounding through about 110 degrees, medioventral process as long as broad at base, its distal margin deeply convex. Aedeagus as figured, a shallowly curved slender process, with three branches, on right at apex, a long rod, bent at middle through 90 degrees, supporting distal part of flagellum, a thin vertical triangular lobe, coarsely dentate along one margin, on dorsal surface of flagellum, arising from a long broad sclerotized lobe, almost parallel-sided for most of its length, that extends from base almost to apex of flagellum.

Genital styles as figured, apical margin in side view oblique, very shallowly convex with distal angle acute and basal angle obtuse, posterior surface of each sloping towards mesal edge, so that when they are apposed a single shallow depression is formed.

♂: length, 2.8 mm; tegmen, 3.5 mm. ♀: length, 2.8 mm; tegmen, 4.0 mm.

Holotype, ♂. HAITI: Plaisance, 1-6. viii. 1961 (*J. Maldonado C.*) in coll. Maldonado C.

Paratypes, 1♂, 1♀. HAITI: same data.

This species is distinguishable by the form of the anal segment, the curvature of the lateral margins of the pygofer, the shape of the aedeagus and that of the genital styles. It is closely related to *B. cacus*, but differs in the shape of the genital styles, and in the structure of the aedeagal flagellum. The differences in the latter are most readily appreciable in the form of the sclerotized lobes that are associated with the dorsal coarsely toothed lobe: in *B. cacus* this lobe is triangular and distally twisted, whereas in *B. lua* it is band-like, and not twisted.

*Bothriocera regalis* sp. nov.

(Figs. 29-36)

♂. Vertex broader than long in middle (about 2.4 : 1), anterior margin shallowly convex, posterior margin almost transverse, an extremely narrow areolet extending completely across vertex at posterior margin. Tegmina longer than broad (2 : 1), apical veins of Sc and R normal, not dilated, a slight eminence on M at nodal line of transverse veinlets. Basal metatarsal segment with seven teeth apically, second segment with two spines and six teeth between them.

Light brownish yellow; forelegs dark fuscous, middle and hind legs faintly infusate; abdomen reddish brown. Tegmina hyaline, distinctly suffused with dull yellow; costal cell at margins and entirely in distal third, apical

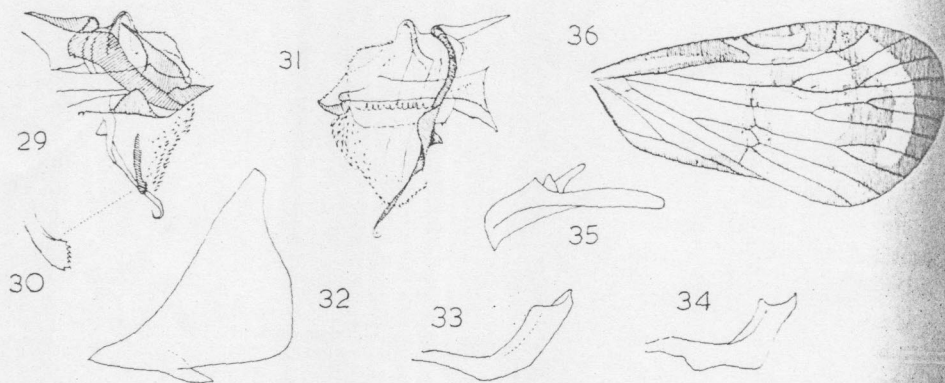
margin broadly from stigma to apex of clavus, a broad band parallel to apical margin overlying transverse veinlets, a fascia extending basad from this along M to below stigma, and a band extending from M at level of apex of costal cell to apex of clavus, and a suffusion along commissural margin of clavus, fuscous, more dilute over posterior angle of tegmen. Wings dilute fuscous.

Anal segment of male much longer than broad, parallel-sided, shallowly longitudinally hollowed out dorsally, apical margin deeply convex. Aedeagus relatively large, as figured, a subtriangular lobe arising from periandrium on left near apex, produced laterad and shallowly curved upward; a broad sclerotized band, widening distad, forming basal portion of flagellum, which distally comprises a rather voluminous denticulate membrane supported by two narrow sclerotised rods, one long, twisted, with a blade-like process at its base, directed cephalad, and a small triangular lobe at middle, the other much dilated distally into a lenticular plate with teeth along its outer margin. Genital styles as figured, inner (upper) surface hollowed out in distal half, apical margin strongly oblique, with inner apical angle acute.

♂: length, 3.0 mm; tegmen, 4.7 mm.

Holotype, ♂, JAMAICA: Kingston, vii. 1961 (*J. Maldonado C.*) in coll. Maldonado C.

This species is distinguishable by its bodily size, the presence of a complete groove-like areolet along the entire length of the posterior margin of the vertex, and the bold pattern of markings on the tegmina. It is not nearly related to any West Indian species so far described.



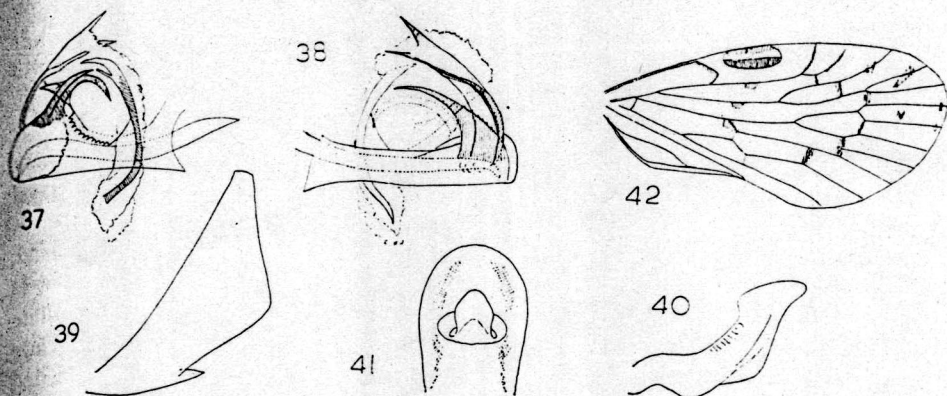
FIGS. 29-36. *Bothriocera regalis* sp. nov. (29) Aedeagus, left side; (30) apex of process on flagellum indicated by broken line; (31) aedeagus, right side; (32) pygofer, left side; (33) left genital style, lateral view; (34) left genital style, slightly posterolateral view; (35) anal segment of male, left side; (36) tegmen.

*Bothriocera nysa* sp. nov.

(Figs. 37-42)

♂♀. Vertex broader than long in middle (nearly 2.3 : 1), anterior margin convex, posterior margin transverse, with a narrow triangular areolet at each posterolateral angle, the areolet narrowly extending mesad as far as middle third of posterior margin. Tegmina longer than broad (2 : 1), apical veins of Sc and R normal, without ceriferous impressions; a slight eminence in M at nodal line of transverse veins. Basal metatarsal segment with eight teeth apically, second segment also with eight.





Figs. 37-42. *Bothriocera nysa* sp. nov. (37) Aedeagus, right side; (38) aedeagus, left side; (39) pygofer, left side; (40) genital style, lateral view; (41) anal segment of male, dorsal view; (42) tegmen.

Pale brownish yellow; mesonotum pale reddish brown; abdomen, except laterally, darker reddish brown. Tegmina marked as figured, subhyaline, greyish, veins basad of nodal line, except Sc, concolorous, elsewhere, except So beneath stigma, fuscous; stigma pale anteriorly, fuscous posteriorly; a small spot on Sc, R and M at level of nodal line, and a suffusion overlying all transverse veinlets, fuscous. Wings greyish hyaline, R-M cross vein and a suffusion in middle of anal area, fuscous, veins mostly fuscous.

♂. Anal segment of male longer than broad (about 1.5 : 1), apical margin deeply convex. Pygofer with lateral margins obtusely subangulately rounding at middle. Aedeagus as figured, a stout curved spinose process, bearing a secondary spine, on right at apex, a long curved rod supporting flagellum, and a parallel-sided lobe, giving off a spinose process, near its apex, overlying its basal portion; membrane of flagellum denticulate on its distal margin; periandrium produced dorsad apically on left in a narrow curved tapering process directed cephalad. Genital styles as figured.

♂: length, 2.6 mm; tegmen, 4.0 mm. ♀: length, 2.7 mm; tegmen, 4.1 mm.

Holotype, ♂. CUBA: Soledad, 10. iii. 1925 (*J. G. Myers*) 618, in B.M.(N.H.).

Paratype, ♀. CUBA: Trinidad Mts., Mina Carlota, 22. iii. 1925 (*J. G. Myers*).

This species superficially is perhaps most readily recognizable among Greater Antillean species by the virtual absence of tegminal markings and by its general light coloration. In the male genitalia it is distinguishable by the shape of the processes of the aedeagus, notably the long narrow process of the periandrium, and by the dentate distal margin of the flagellum.

#### *Bothriocera cotiso* sp. nov.

(Figs. 43-47)

♂♀. Vertex broader than long in middle (2.3 : 1), anterior margin convex, posterior margin very shallowly angulately excavate, a triangular areolet at each posterolateral angle extending narrowly almost to middle. Tegmina longer than broad (2.2 : 1), apical veins of Sc and R dilated apically so as to appear forked, a submarginal rounded eminence in stigmal cell beyond stigma,

and another, much smaller, in third apical cell, a slight eminence on M at nodal line of transverse veinlets. Basal metatarsal segment with eight teeth apically, second segment with two spines and six or seven scale-bearing teeth.

Yellowish brown; frons, clypeus and vertex, except near margins, procoxae and profemora, mesopleura and abdomen, dark brown; mesonotum dark reddish brown. Tegmina subhyaline, clavus, except basally between claval veins, a spot at apex of basal cell, a suffusion at base and a spot at apex of costal cell, a broad band from stigma to apex of clavus, and a broader band, partly interrupted anteriorly and at middle by a round spot, and a spot in first apical cell of M, dark fuscous; veins in corium concolorous or dilute yellowish brown, except Sc + R and M, which are dark reddish brown. Wings mostly infuscate, a pale area near base and another between R and M distad of transverse veinlets.

♂. Anal segment of male rather narrowly ovate, distally abruptly and obliquely deflexed, apical margin obliquely truncate. Pygofer in side view broadly rounding, medioventral process narrow, fully three times as long as broad at base. Aedeagus as figured, a deeply curved sparsely dentate spinose process on right at apex, a long rod, a little dilated basally, supporting distal part of flagellum, an ovate scoop-shaped sclerotized plate below it; two spinose processes dorsally on left of flagellum, the upper one shorter and more slender than the lower.

Genital styles as figured, posterior surface of each hollowed out longitudinally, inner apical angle obtusely rounding.

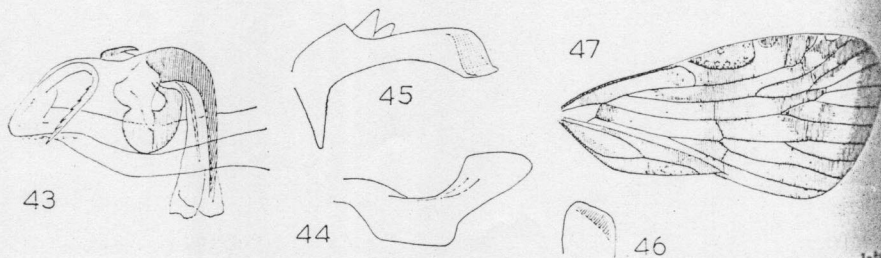
♀. Ovipositor with inner edges of first valvulae markedly separated close to base.

♂: length, 3.0 mm; tegmen, 4.0 mm. ♀: length, 3.3 mm; tegmen, 4.5 mm.

Holotype, ♂. JAMAICA: St. Thomas, vii. 1961, (*J. Maldonado C.*) in coll. J. Maldonado C.

Paratypes, 1♂, 1♀. Same data as holotype.

As the similar descriptions indicate, this species is extremely close to *B. diploneura* in general appearance. Slight differences exist in the relative lengths of the apical cells of the tegmina (such as  $M_2$ ) and in details of tegminal pattern. These are best understood from the figures. In the male genitalia, however, the differences are well marked. The anal segment, abruptly deflexed near its posterior margin and obliquely truncate apically (and on this account, bilaterally asymmetrical) contrasts strongly with that of *B. diploneura*, which is dorsally shallowly longitudinally hollowed, and has a rather deeply



FIGS. 43-47. *Bothriocera cotiso* sp. nov. (43) Aedeagus, right side; (44) genital style, lateral view; (45) anal segment of male, left side; (46) apex of anal segment of male, dorsal view; (47) tegmen.

convex apical margin, and is bilaterally symmetrical. In the aedeagus the most evident difference is the absence of both a fan-like process and a spine from the scroll-like lobe of the flagellum, which instead is wholly sclerotized in a scoop-shaped plate. The genital styles are not pointed at the inner apical angle; other points in which they differ from those of the other two species are best understood from the figures.

*Bothriocera latens* sp. nov.

(Figs. 48-50)

♀. Vertex broader than long in middle (about 2.0 : 1), anterior margin sub-angulately convex, posterior margin almost transverse, an extremely narrow areolet extending completely across vertex at posterior margin. Tegmina longer than broad (2.1 : 1), apical veins of Sc and R dilated apically so as to appear forked, a submarginal rounded eminence in stigmal cell beyond stigma, and another, much smaller, in third apical cell, a slight eminence on M at nodal line of transverse veinlets. Basal metatarsal segment with 11-12 spines apically, second segment with two spines and eight or nine scale-bearing teeth between them.

Light tawny yellow; mesonotum and abdomen, fuscous. Tegmina sordid milky hyaline with a faint yellowish tinge, a spot at apex of costal cell, a band, subequal in width throughout from stigma to apex of clavus, a suffusion inside forks of R and  $M_{1+2}$ , all transverse veinlets, an irregular cloud in apical cells R and  $R_s$ , and a spot in middle of first apical cell of M, and a suffusion between posterior claval vein and margin, fuscous; six small spots in stigma, and six submarginal spots at apex of veins of Sc and R, and in their apical cells, pale pinkish grey; Sc and R in corium, and all veins distad of nodal line, fuscous. Wings lightly infumed, a round area near transverse veinlets, and apical cells in their distal third, pale greyish, translucent. Veins fuscous.

♀: length, 3.5 mm; tegmen, 5.0 mm.

Holotype, ♀. HAITI: Barr. Peligre, 1-6. viii. 1961, (*J. Maldonado C.*), in coll. Maldonado C.

Paratypes, ♀. HAITI: Port au Prince, vii. 1961 (*J. Maldonado C.*).

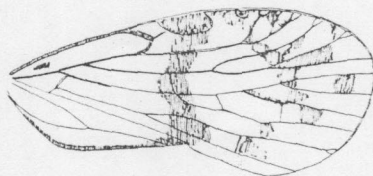
This species is apparently the Haitian counterpart of *B. cotiso*. It is distinctly larger, and has a definite transverse areolet along the entire posterior margin of the vertex. The number of spines and teeth on the basal and second tarsal segments is distinctly greater than in other Haitian species.



48



49



50

FIGS. 48-50. *Bothriocera latens* sp. nov. (48) Vertex, posterodorsal view to show narrow transverse areolet; (49) teeth at apex of basal and second metatarsal segments; (50) tegmen.

*Bothriocera ferruginea* sp. nov.

(Figs. 51-57)

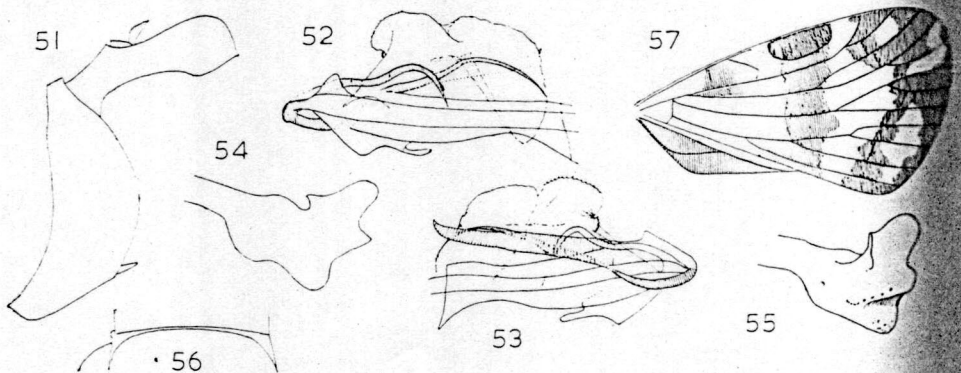
♂. Vertex broader than long in middle (2.2 : 1), anterior margin subangulately convex, posterior margin almost transverse, an extremely narrow areolet extending to middle of vertex at posterior margin. Tegmina longer than broad (2.1 : 1), apical veins of Sc and R not at all dilated apically, slight eminence on M at nodal line of transverse veinlets. Basal metatarsal segment with eight spines apically, second segment with two spines and six scale-bearing teeth between them.

Tawny yellow; frons, clypeus and vertex, except near margins, procoxae, mesopleura, mesonotum, abdomen and male genitalia, except at posterior margin of pygofer, reddish brown. Tegmina yellowish or milky hyaline, a suffusion at apex of costal cell extending posteriorly to R, a broad band slightly undulate, from stigma to apex of clavus, a semicircular spot near apical angle, interrupted at its middle by a clear area in second apical cell of Sc, a broad suffusion over line of transverse veinlets, first apical cell of M in distal half, and a diffuse cloud in distal portion of remaining apical cells, yellowish brown. Wings greyish hyaline, a broad suffusion across wing at level of transverse veinlets, and a suffusion over all apical cells, dilute yellowish brown.

Anal segment of male longer than broad, lateral margins strongly deflexed, apical margin convex. Pygofer in lateral view with posterior margin shallowly convex. Aedeagus as figured, a moderately long, sinuate spinose process, with two small teeth near apex, on right at apex, curving ventrad; a slender rod, arising apically on left and curving to right above aedeagus supporting flagellum, which is relatively large; a flattened weakly sclerotized ensiform lobe on left, apparently arising near base of flagellum; phallobase (periandrium) ventrally near apex produced slightly to left in a small shallowly curved lobe. Genital styles as figured, with a stout oblique ridge on outer surface, apical margin strongly sinuate.

♂: length, 3.3 mm; tegmen, 4.7 mm.

Holotype, ♂. HAITI: Port au Prince, ii. 1925 (*G. N. Wolcott*) Acc. 133-23 in B.M.(N.H.).



FIGS. 51-57. *Bothriocera ferruginea* sp. nov. (51) Pygofer and anal segment, left side; (52) aedeagus, right side; (53) aedeagus, left side; (54) left genital style, posterolateral view; (55) left genital style, lateral view; (56) areolet on posterior margin of vertex; (57) tegmen.

This species differs from *B. hispaniolae* and *B. lua* in the shape of the genital styles, and from *B. latens* in the apical veinlets of Sc and R not being at all dilated near the apical margin.

*Bothriocera haitiana* sp. nov.

(Figs. 58-62)

♂♀. Vertex broader than long in middle (2.2 : 1), anterior margin obtusely angulate, posterior margin very shallowly concave, almost transverse, a small triangular areolet, about twice as long basally as high, at each posterolateral angle. Tegmina longer than broad (2.2 : 1), apical veins of Sc and R markedly dilated, almost bifurcate, near junction with apical margin, a minute ceriferous eminence in stigmal cell at margin distad of stigma, a slight eminence in M at nodal line of transverse veinlets. Basal metatarsal segment with eight teeth distally, second segment also with eight.

Dark reddish brown; margins of vertex, frons and clypeus, rostrum, protibiae, mesotibiae and tarsi, and hind legs, tawny. Tegmina deeply infusate, a subovate area in basal quarter between Sc+R and posterior claval vein, and a V-shaped area overlying subapical cells of R and M, or a narrow pale area in each of these cells, sordid yellowish hyaline. In fresh specimens, a row of five spots of pink granular wax along apical margin of costal cell, a ring of about nine such spots submarginally in stigma itself, and three separate spots or one elongate spot near margin between apical forks of veins of Sc and R. Wings fuscous, with a large pale area in basal third and a smaller pale area in M at distal third.

♂. Anal segment of male bilaterally symmetrical, markedly longer than broad, dorsal surface curving down distally to apical margin, which is shallowly convex. Pygofer in side view strongly rounding through about 90 degrees, medioventral process narrow. Aedeagus as figured, periandrium produced dorsocephalad on left near apex in a moderately long lobe, finely denticulate on margin; a strongly decurved, rather twisted process, bearing three or four spines on its outer margin, arising on right at apex; a stout rod, bent through 90 degrees, forming main support of flagellum acuminate distally; a lanceolate or subensiform process in membrane above it on left towards base, and a broad sclerotized plate, abruptly thickened and pigmented at its margins, below it, and produced apically in a narrow upcurved lobe denticulate on its lower margin. Genital styles as figured, upper surface longitudinally hollowed, apical margin oblique, slightly sinuate.

♂: length, 3.0 mm; tegmen, 4.6 mm. ♀: length, 3.0 mm; tegmen, 4.2 mm.

Holotype, ♂. HAITI: Kenscoff, 1-6. viii. 1961 (*J. Maldonado C.*) in coll. Maldonado C.

Paratypes, 2♀. HAITI: Pt. Prince, vii. 1961. (*J. Maldonado C.*)

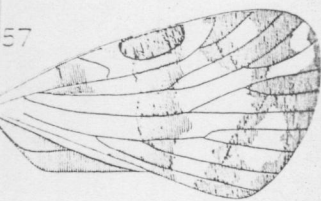
This species is the Haitian representative of the *pachyneura* group. It is immediately recognizable by its darker coloration, and the tegminal pattern of two pale patches, remote from the margin, on a dark ground. In the male genitalia, the anal segment is perhaps nearest to that of *diploneura*, but this species and *pachyneura* both have a well-developed spinose process on the ventral lobe of the flagellum, a feature entirely absent in *haitiana*. In the *pachyneura* group the lobe with a denticulate margin is peculiar to this species.

1), anterior margin sub-  
se, an extremely narrow  
margin. Tegmina longer  
at all dilated apically, a  
inlets. Basal metatarsal  
with two spines and six

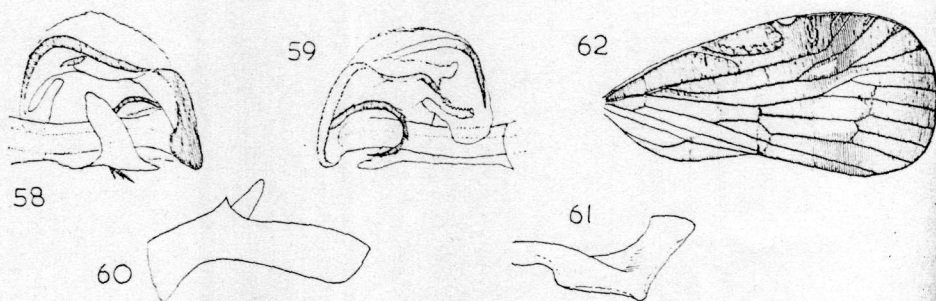
t near margins, procoxae,  
alia, except at posterior  
wish or milky hyaline, a  
rly to R, a broad band,  
a semicircular spot near  
ea in second apical cell of  
s, first apical cell of M in  
of remaining apical cells,  
suffusion across wing at  
pical cells, dilute yellowish

margins strongly deflexed,  
posterior margin shallowly  
nuate spinose process, with  
g ventrad; a slender rod,  
eagus supporting flagellum,  
tized ensiform lobe on left,  
se (periandrium) ventrally  
owly curved lobe. Genital  
iter surface, apical margin

*G. N. Wolcott*) Acc. 133-25,



and anal segment, left side;  
genital style, posterolateral view;  
margin of vertex; (57) tegmen.



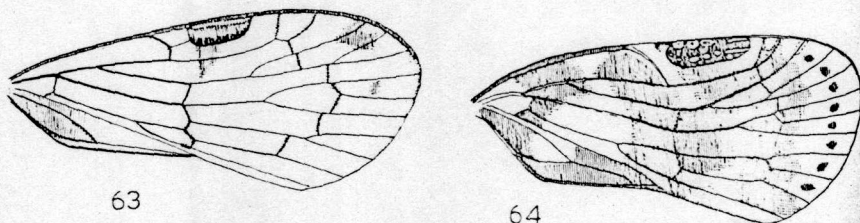
FIGS. 58-62. *Bothriocera haitiana* sp. nov. (58) Aedeagus, left side; (59) aedeagus, right side; (60) anal segment of male; (61) left genital style, lateral view; (62) tegmen.

*Bothriocera undata* (F.)

(Fig. 63)

*Issus undatus* Fabricius, J. C., 1803, *Systema Rhyngotorum*, 1803: 101.

Through the extreme kindness of Dr. Borge Petersen of the Universitetets Zoologiske Museum, Copenhagen, it is possible to figure the tegmen of the type. The specimen (which is the only representative of the species in the Fabrician collection) is labelled 'Insulae Amer. Schmidt. Mus. Seh. et T.L. *undata* F.' It agrees closely with members of a Puerto Rican population, but the precise type locality cannot be determined until specimens from the St. Barts. group of islands have been studied.



FIGS. 63 and 64. (63) *Bothriocera undata* (F.). Tegmen of holotype. (64) *Bothriocera bicornis* (F.). Tegmen of lectotype.

*Bothriocera bicornis* (F.)

(Fig. 64)

*Issus bicornis* Fabricius, J. C., 1803, *Systema Rhyngotorum*, 1803: 101.

The present opportunity, also provided by Dr. Petersen, is taken to designate one of the type series of *Issus bicornis* bearing a square green label, and the words 'Amer. merid. Mus. Seh. et T.L. *bicornis* F.' as the lectotype, and the specimen has been so labelled. This species does not occur in the West Indies.

*Adanella* subgen. nov.

Vertex broader at base of middle line than long (about 2.6:1), anterior margin transverse, shallowly arcuate or obtusely angulate, lateral margins straight, posterior margin transverse, a transverse carina situated close to and parallel with posterior margin; antennae sunk in a pit, second segment deeply

excavate on its anterior margin; eye deeper dorsoventrally than long; maxillary lobe with anterior margin straight, parallel to lateral margin of frons; frons and clypeus with lateral carinae foliately produced laterad; median ocellus distinct; rostrum surpassing post-trochanters. Pronotum very short; mesonotum with three carinae, tegulae carinate. Post-tibiae with six spines apically, basal metatarsal segment with eight spines apically, second segment typically with two spines and six teeth. Tegmina longer than broad (about 2.3 : 1), in repose curved closely above the abdomen, completely overlapping apically as in Plectoderine Achilidae; venation as in *Bothriocera*, but transverse veinlets less evident; clavus not reaching to middle of hind margin, claval veins uniting near middle of clavus.

Type species, *Bothriocera albidipennis* Fowler, 1904, *Biologia cent.-am. Rhynchota*, 1 : 84.

This subgenus is separated from typical *Bothriocera* by the straight anterior margin of the maxillary sclerite (which is distinctly convex in the typical subgenus), by the presence of a complete transverse carina near the posterior margin of the vertex and by the relatively narrower tegmina. In general appearance, however, members of the two subgenera are immediately distinguishable from one another by the body outline as determined by the carriage of the tegmina in repose. Species of *Adanella* are parallel-sided, and more like an Achilid than a Cixiid, whereas species of *Bothriocera* have a broadly triangular form on account of the triangular shape of the tegmina and the low pitch at which they are carried.

In addition to the type species the following are included in *Adanella*: *Bothriocera (Adanella) excelsa* (Fowler); (*Bothriocera excelsa* Fowler, 1904, *ibid.* : 83), *Bothriocera (Adanella) pellucida* (Fowler); (*Bothriocera pellucida* Fowler, 1904, *ibid.* : 83); and *Bothriocera (Adanella) nigra* (Fowler); (*Bothriocera nigra* Fowler, 1904, *ibid.* : 84).

#### NYMPHOCIXIA Van Duzee

*Nymphocixia* Van Duzee, E. P., 1923, *Proc. Calif. Acad. Sci.* (4) 12 : 189.

Type species, *Nymphocixia unipunctata* Van Duzee, 1923, *ibid.* : 189.

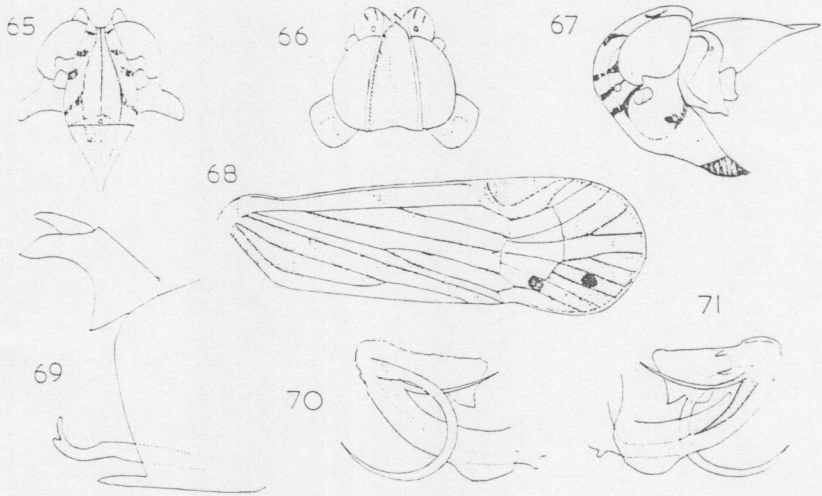
#### *Nymphocixia caribbea* sp. nov.

(Figs. 65-71)

♂♀. Vertex longer in middle than broad at base (2 : 1), lateral margins converging distad, median carina absent; frons in profile with margin almost straight in its distal three-quarters. Tegmina as in typical species, but with Sc two-branched at margin distad of stigma, M five-branched at apex, Cu<sub>1</sub> two-branched.

Pallid ochraceous; about eight short parallel stripes, occasionally interrupted, on side of head, frons and clypeus, lateral fields of mesonotum, mesopleura in part, two transverse bands on post-tibiae, a band on basal segment of metatarsus, second tarsal segment, abdominal tergites except at lateral margins, and ventrites except at hind margins, dark reddish brown; median portion of mesonotal disc light orange-brown. Tegmina greyish hyaline, an oblique fascia from middle of costal cell to M at nodal line of crossveins, interrupted suffusions overlying M and Cu in corium, and clavus near junction of claval veins; distal line of transverse veinlets, a curved band at apical angle

and a round patch at anal angle, fuscous; a spot in third apical cell of M, darker fuscous. Wings greyish hyaline, with veins dilute brown. In male, all markings much paler or absent.



FIGS. 65-71. *Nymphocixia caribbea* sp. nov. (65) Frons and clypeus; (66) head and pronotum, dorsal view; (67) head and thorax, lateral view; (68) tegmen; (69) anal segment, pygofer and genital style, right side; (70) aedeagus, right side; (71) aedeagus, left side.

♂. Anal tegment of male moderately long, apical margin in dorsal view acute, lateral margins rather deep, each strongly produced ventrad near base in an angular lobe. Pygofer in lateral view with posterior margin shallowly convex, dorsolateral angles not produced, a large triangular medioventral process present. Aedeagus with basal part tubular, ascending distad, produced ventrad in a vertical plate which is deepest near base; a long stout spinose process arising on right near apex, directed ventrocephalad then bent caudad, a second and shorter process arising dorsally on left near apex, directed laterocephalad and slightly curved, a curved spinose process arising dorsally near apex, directed cephalad; flagellum broad, relatively short, its apical angles devoid of sclerotized processes. Genital styles slender, parallel-sided and almost straight in side view, directed caudad and curving mesad, a finger-like process arising dorsally distinctly before apex and directed dorsad.

♂: length, 2.6 mm; tegmen, 3.3 mm. ♀: length, 3.5 mm; tegmen, 4.2 mm.

Holotype, ♂. CAYMAN IS.: Grand Cayman, north coast, north side, 9. vii. 1938 (Lewis & Thompson) in B.M.(N.H.).

Paratypes, 10♂, 10♀: same data.

This species differs from *N. unipunctata* and *N. vanduzeei* in the profile of the head, which in these species is evenly and semicircularly rounded from the base of the vertex to the base of the clypeus, in the proportions of the vertex and the convergence of its lateral margins, in colour pattern and in the shape of the male genitalia.



In the Carribbean area, *Nymphocixia* is known from Panama, northern Colombia and Florida. *N. caribbea* is well separated from *N. unipunctata* V.D. and *N. vanduzeei* Muir by the shape of the aedeagus, and from *N. vanduzeei floridensis* Caldwell (known only from a single female) by tegminal coloration and by smaller size, the total length of the female of *N. caribbea* being about 4.8 mm, as contrasted with 6 mm.

#### HAPLAXIUS Fowler

*Haplaxius* Fowler, 1904, *Biologia centr.-am. Rhynchota*, 1 : 97.  
Type species, *Haplaxius laevis* Fowler, 1904, *ibid.* : 98.

#### *Haplaxius crudus* (Van Duzee)

*Myndus crudus* Van Duzee, 1907, *Bull. Buffalo Soc. nat. Sci.* 8 (5) : 33.

1♀. CAYMAN IS. : Grand Cayman, west end, Georgetown, 30. iv. 1938  
(Lewis & Thompson).

#### PINTALIA Stål

*Pintalia* Stål, 1862, *Handl. svenska Vet. Akad.* 3 (6) : 4.  
Type species, *Pintalia lateralis* Stål, 1862, *ibid.* : 4.

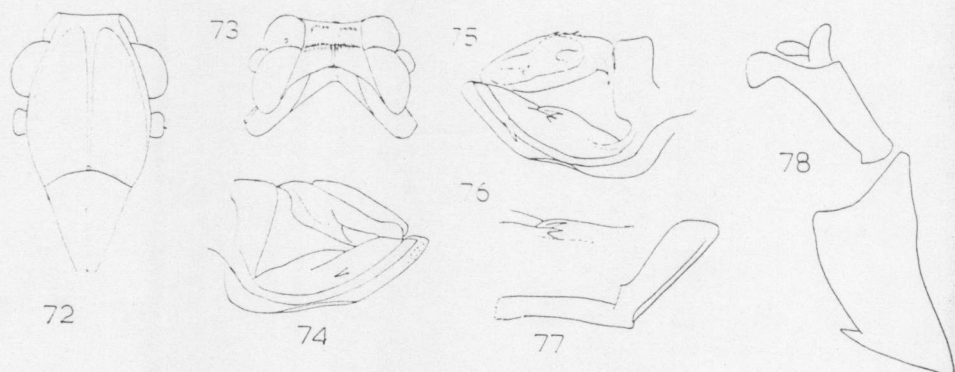
#### *Pintalia damalis* sp. nov.

(Figs. 72-78)

♂♀. Vertex broader between basal angles than long in middle line (2.1 : 1), and than at anterior margin (1.6 : 1), posterior compartment longer than anterior (2.5 : 1), a well-developed median carina dividing posterior compartment, an obscure median carina in anterior compartment; frons longer in middle line than broad (1.2 : 1), widest at two-thirds from base, lateral margins rather thickened basally, becoming finer distad; median ocellus small but distinct; rostrum with subapical segment attaining post-trochanters.

Light yellowish brown; sides of head, pronotum behind eyes and lateral fields of mesonotum, abdomen, except at posterior margin of sternites, and sometimes femora and post-tibiae, darker reddish brown. Tegmina subopaque, corium fuscous, mottled with yellowish brown, commissural margin of clavus and cell adjoining it, and apical margin from  $M_2$  to  $Cu_{1b}$ , pale tawny; veins fuscous, with darker granules, all veins pallid near junction with apical margin; wings sordid greyish hyaline, veins fuscous.

♂. Anal segment of male moderately long, abruptly deflexed in distal fifth. Pygofer with dorsolateral angles subacutely produced. Aedeagus tubular, minutely denticulate at apex, a very small spinose process, directed cephalad, on left at two-thirds from base, and a similar process on right at about three-quarters from base, two small spinose processes dorsally directed cephalad, at about two-thirds from base, flagellum rather large, about two-thirds as long as aedeagus, a weak flange on left in basal half, with a minute spine projecting cephalad from its margin; flagellum strongly decurved near apex and tapering into a stout curved spine; dorsal surface of flagellum at its right edge bearing a row of about three minute unpigmented spines, directed cephalad. Genital styles as figured, long, narrow, angulately bent upward through about 50 degrees at middle, gradually widening from middle to apex, apical margin strongly oblique, a small eminence on dorsal margin near point of flexure.



FIGS. 72-78. *Pintalia damalis* sp. nov. (72) Frons and clypeus; (73) vertex and pronotum; (74) aedeagus, left side; (75) aedeagus, right side; (76) processes on dorsal surface of aedeagus; (77) genital style, lateral view; (78) anal segment of male (shown detached) and pygofer, right side.

♂: length, 3.0 mm; tegmen, 4.4 mm. ♀: length, 3.5 mm; tegmen, 5.0 mm. Holotype, ♂. CAYMAN IS.: Grand Cayman, south coast, south sound, 17. vi. 1938 (*Lewis & Thompson*) in B.M.(N.H.).

Paratypes, 3♀. Same locality, 17, 18, vi. 1938.

This species has the same general appearance and coloration as *P. delicata* Fowler and *P. dorsivittata* V.D., but is distinctly smaller than both. It differs from both in the finer carination of the anterior compartment of the vertex. From *P. delicata* it also differs in the shape of the male anal segment. This is comparatively elongate in *delicata*, and deflexed distally. From *dorsivittata* the present species differs in the relatively longer posterior compartment of the vertex, the more convex sides of the head above the eyes, as seen in profile, the less markedly produced and more bluntly rounded dorso-lateral angles of the pygofer. It also differs from both species in the number and position of spines on the aedeagus.

#### CUBANA Uhler

*Cubana* Uhler, P. R., 1895, *Proc. zool. Soc. Lond.* 1895: 62.  
Type species, *Cubana tortrix* Uhler, 1895, *ibid.*: 62.

#### *Cubana cypassis* sp. nov.

(Figs. 79-84)

♂♀. Vertex broader between posterolateral angles than long in middle (4.7 : 1) and than at anterior margin (1.7 : 1); posterior compartment measured at side longer than anterior (3.5 : 1), median carina well developed in anterior compartment, absent in posterior compartment, anterior margin and transverse carina parallel, both angulate at middle. Frons longer than broad (1.3 : 1).

Light yellowish; intercarinal areas of frons, vertex and mesonotum, abdomen dorsally and anal segment, dark reddish brown. Tegmina greyish hyaline, three oblique stripes in costal cell, chevron-like spots on veins of corium; a narrow band, angulately bent in Cu, from apex of costal cell to apex of common claval vein, a second, parallel to the preceding, from margin

just distad of stigma to apex of clavus, an ovate spot overlying apical cells of Sc and R, and a narrow band distad of it parallel to its outer edge and two dark spots on an ovate dilutely suffused area at anal angle, fuscous; veins pale or concolorous. Wings greyish hyaline, dilute fuscous near apical angle, veins fuscous.

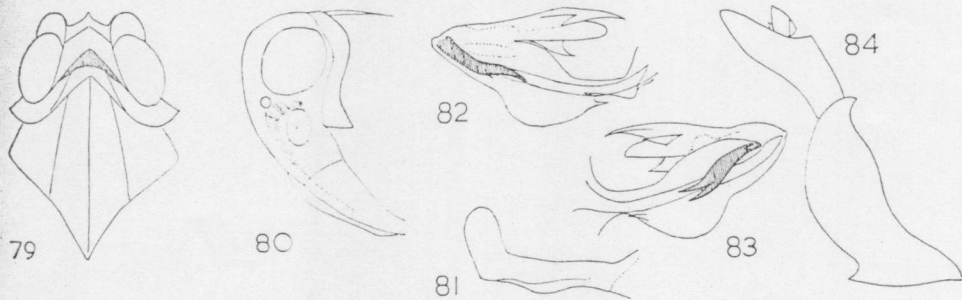
♂. Anal segment of male moderately long, not deflexed distally, ventral margin in lateral view weakly sinuate, apical margin convex. Pygofer with dorsolateral angles not produced, lateral margins in side view shallowly convex. Aedeagus tubular, with a deep convex median flange ventrally, bearing a small spine, directed cephalad, at its base, a moderately long stout sinuate spinose process laterally on right near apex directed cephalad, and a sinuate spinose process, distally bifurcate, on left near apex, directed cephalad; flagellum almost as long as aedeagus, acute distally, a small triangular sub-spinose process on each side at three-quarters from base. Genital styles rather long in side view, almost parallel-sided in basal two-thirds, angulately bent upward in apical third and a little wider, apical margin almost semi-circularly convex.

♂: length, 3.3 mm; tegmen, 4.0 mm. ♀: length, 3.5 mm; tegmen, 5.0 mm.

Holotype, ♂: CAYMAN Is.: Grand Cayman, south coast, south sound, 17. vi. 1938 (*Lewis & Thompson*) in B.M.(N.H.).

Paratypes, 3♀. Same data, 17, 18. vi. 1938.

This species is distinguished by the structure of the male genitalia. It differs from *C. tortriciformis* Muir in the shape of the head in profile, the frons and the lateral margins of the head above the eyes being less strongly convex.



FIGS. 79-84. *Cubana cypassis* sp. nov. (79) Head and thorax, dorsal view; (80) head and pronotum, lateral view; (81) right genital style, lateral view; (82) aedeagus, right side; (83) aedeagus, left side; (84) anal segment and pygofer, right side.

### CYCLOPOLIARUS Fennah

*Cyclopoliarus* Fennah, R. G., 1945 b, *Proc. biol. Soc. Wash.* 58: 135.

Type species, *Oliarus biperforatus* Fennah, 1945 a, *Proc. U.S. natn. Mus.* 95: 419.

#### *Cyclopoliarus pirata* sp. nov.

(Figs. 85-92)

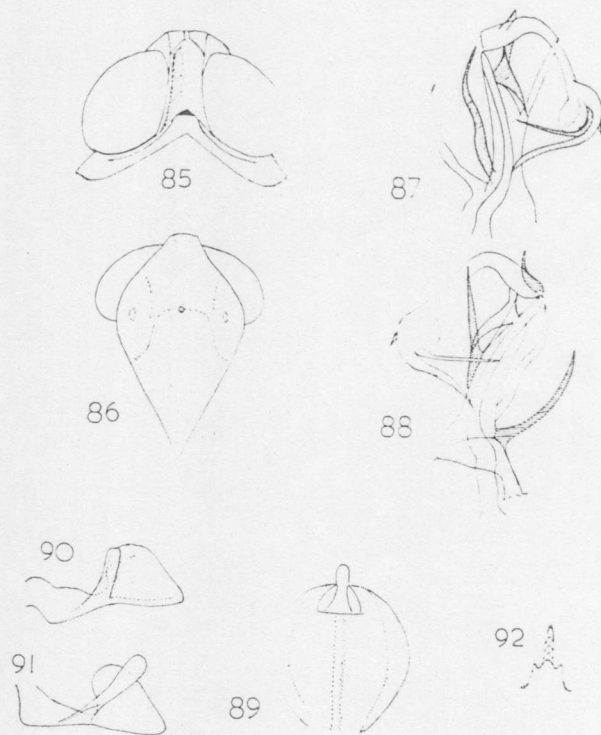
♂. Vertex longer in middle line than wide at apex (2 : 1) and longer along lateral margin than wide at narrowest part between eyes (3 : 1); lateroapical areolets extending caudad for scarcely one third length of vertex. Frons with

lateral margins produced laterad, median carina forked at extreme base; rostrum reaching to beyond middle of abdomen. Tegmina with  $M_{1+2}$  not quite one third length of  $M_{3+4}$ .

Light reddish brown; intercarinal areas of vertex, mesonotum, apical segment of rostrum, and middle line of anal segment, darker reddish brown or castaneous; legs and lower surface of abdomen, pale yellowish brown, or tawny. Tegmina vitreous, stigma, veins distad of nodal line, and basal three-quarters of commissural margin, fuscous. Wings vitreous or iridescent, veins fuscous.

Anal segment of male in dorsal view ovate, weakly ridged along middle line. Aedeagus as figured, with two long spinose processes directed caudad arising basally on right, a slightly shorter spinose process, directed caudad, on left at middle; a stout curved spinose process dorsally near apex, directed cephalad, and a small stout spinose process at apex directed laterocaudad to left; flagellum long, narrow in basal three-quarters, expanded and inflected mesad in apical quarter, with two long spinose processes directed to right, a small spine directed cephalad and a small membranous pad. Genital styles as figured, inner lobe on left style longer than on right style.

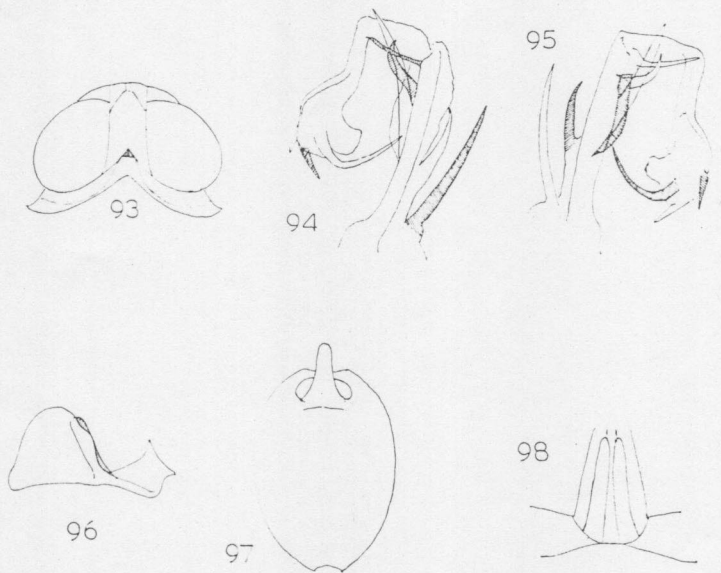
♂: length, 5.3 mm; tegmen, 6.5 mm.



FIGS. 85-92. *Cyclopoliarus pirata* sp. nov. (85) Head and pronotum, dorsal view; (86) frons and clypeus; (87) aedeagus, dorsal view; (88) aedeagus, ventral view; (89) anal segment of male, dorsal view, normal outline shown in broken line, outline when artificially depressed shown in solid line; (90) right genital style, posterolateral view of mesal face; (91) left genital style, mesal aspect; (92) medioventral process of pygofer.

Holotype, ♂. CAYMAN Is.: Grand Cayman, north coast, north side, 15. vii. 1938; Hut Road, light trap B. (Lewis & Thompson) in B.M.(N.H.).  
Paratype ♂. Same data.

This species comes nearest to *C. jamaicensis* Fennah (figs. 93-98) but has a relatively narrower vertex and in the aedeagus almost every spine is of a different length or shape from its counterpart in the Jamaican species.



Figs. 93-98. *Cyclopoliarus jamaicensis* Fennah. (93) Head and pronotum, dorsal view; (94) aedeagus, ventral view; (95) aedeagus, dorsal view; (96) right genital style, lateral view; (97) anal segment of male; (98) base of ovipositor and posterior margin of seventh sternite, ventral view.

*Cyclopoliarus hispaniolae* sp. nov.

(Figs. 99-105)

♂♀. Vertex longer in middle line than wide at apex (2.3 : 1) and longer along lateral margin than wide at narrowest part between eyes (3 : 1), latero-apical areolets narrow, extending caudad for about two-fifths length of vertex. Frons with lateral margins produced laterad, median carina forked at about one-third from base, rostrum reaching beyond middle of abdomen. Tegmina with  $M_{1+2}$  one-third length of  $M_{3+4}$ .

Dark fuscous shading to reddish brown, frons lateroapically, sides of head, antennal collar, a spot on each side of vertex, pronotum behind eyes, ivory-white or pale tawny; legs dilute fuscous. Tegmina milky hyaline, a spot in first apical cell of R and one in first apical cell of M; veins more or less alternately dark fuscous or ivory-white, the forks being fuscous. Wings hyaline, veins fuscous.

♂. Anal segment of male in dorsal view elongate, approximately ovate but with right side less convex than left; not bilaterally symmetrical, produced laterad on left at three-quarters from base in a short triangular process. Aedeagus and genital styles as figured.

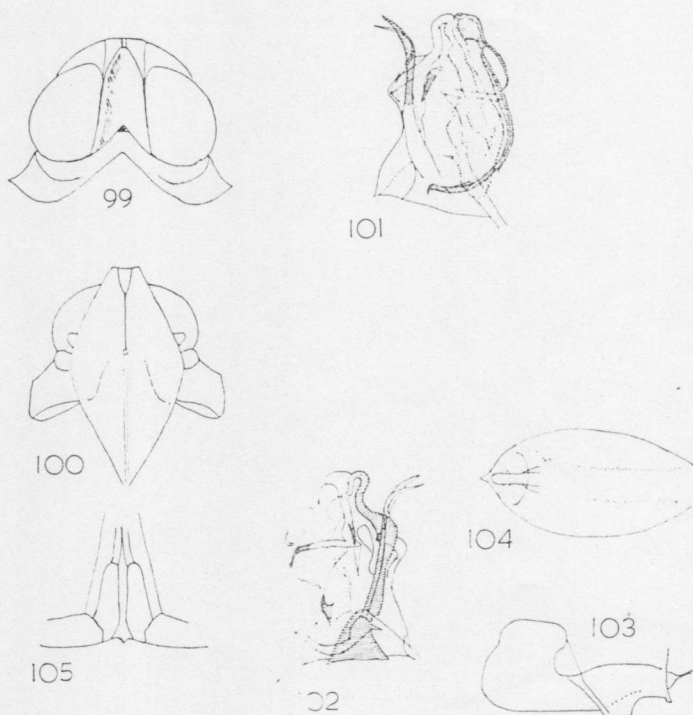
Anal segment of female large, broadly triangular. First valvulae as figured. Pregenital sternite with posterior margin shallowly convex, distinctly notched at middle.

♂: length, 5.0 mm; tegmen, 7.0 mm. ♀: length, 7.8 mm; tegmen, 7.0 mm.

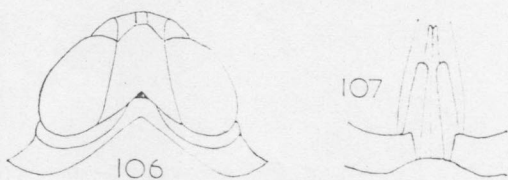
Holotype, ♂. HARTI: Kenseff. 1-6. viii. 1961, (*J. Maldonado C.*) in coll. Maldonado C.

Paratype, ♀. Same data.

This species is readily distinguishable by the relatively elongate frons and the alternate fuscous and pallid markings on the tegminal veins. The position of the fork of the median carina of the frons is like that in *C. atkinsae* (Myers) (figs. 106, 107), but the two differ in the shape of the pregenital sternite and of the first valvifers, and also in the aedeagus.



FIGS. 99-105. *Cyclopoliarus hispaniolae* sp. nov. (99) Head and pronotum, dorsal view; (100) frons and clypeus; (101) aedeagus, dorsal view; (102) aedeagus, ventral view; (103) genital style, lateral view; (104) anal segment of male, dorsal view; (105) base of ovipositor and posterior margin of seventh sternite, ventral view.



FIGS. 106 and 107. *Cyclopoliarus atkinsae* Myers. (106) Head and pronotum, dorsal view; (107) base of ovipositor and posterior margin of seventh sternite, ventral view.

## Family DELPHACIDAE

## SOGATODES Fennah

*Sogatodes* Fennah, R. G., 1963 b, *Bull. ent. Res.* 54 : 71.  
Type species, *Sogatodes molinus* Fennah.

*Sogatodes molinus* Fennah

*Sogatodes molinus* Fennah, R. G., 1963 b, *Bull. ent. Res.* 54 : 72.

1♂. CAYMAN IS.: Grand Cayman, south coast, south sound, 19. vi. 1938.  
(Lewis & Thompson).

*Sogatodes orizicola* (Muir)

*Sogata orizicola* Muir, F., 1926, *Bull. Hawaiian Sug. Plrs' Ass. Expt. Stn.* 18 : 27.

2♂. CAYMAN IS.: Grand Cayman, north coast, north side, 15. vii. 1938;  
south coast, south sound, 19. vi. 1938 (Lewis & Thompson).

## PEREGRINUS Kirkaldy

*Peregrinus* Kirkaldy, G. W., 1904, *Entomologist*, 37 : 175.  
Types species, *Delphax maidis* Ashmead.

*Peregrinus maidis* (Ashmead)

*Delphax maidis* Ashmead, W. H., 1890, *Psyche, Camb.* 5 : 323.

1♂. CAYMAN IS.: Grand Cayman, west end, Georgetown, 3. viii. 1938  
(Lewis & Thompson).

## SYNDELPHAX Fennah

*Syndelphax* Fennah, R. G., 1963 a, *Proc. R. ent. Soc. Lond.* B 32 : 16.  
Type species, *Delphax matanitu* Kirkaldy.

*Syndelphax matanitu* (Kirkaldy)

*Delphax matanitu* Kirkaldy, G. W., 1907, *Bull. Hawaiian Sug. Plrs' Ass. Expt. Stn.* 3 : 155.

1♂. CAYMAN IS.: Grand Cayman, west end, Georgetown, 3. viii. 1938  
(Lewis & Thompson).

*Syndelphax pero* sp. nov.

(Figs. 108-116)

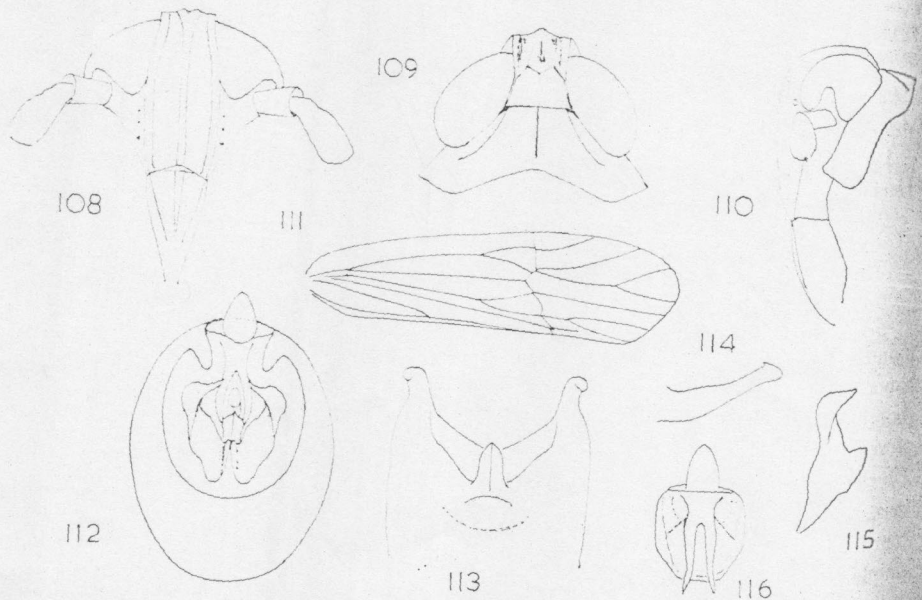
♂. Vertex longer medially than broad at base (1.14 : 1), slightly obtusely rounding into frons, a little narrower at apex than at base, lateral margins almost parallel, apical margin transverse with submedian carinae slightly prominent. Y-shaped carina rather weak, submedian carinae uniting at apex of vertex, basal compartment of vertex wider at hind margin than greatest length (1.5 : 1); and than median length (1.75 : 1), frons in middle line longer than wide at widest part (2.3 : 1), widest at middle, lateral margins feebly concave between eyes, thence weakly convex, almost parallel, median carina simple or forked at extreme base; clypeus at base scarcely wider than frons at apex, postclypeal disc as long as broad at base, in profile straight, anteclypeus in profile moderately convex; entire clypeus in profile shallowly convex; rostrum slightly surpassing mesotrochanters, apical segment a little shorter than subapical; antennae attaining frontoclypeal suture, basal segment longer

than broad (2.5 : 1), second segment longer than first (1.2 : 1); ocelli distinct. Pronotum with disc about as long in middle line as broad at anterior margin, lateral carinae weakly concave, not attaining hind margin. Total length of mesonotum greater than that of scutellum (2.4 : 1). Post-tibial spur with 15-16 teeth.

Pallid ochraceous; intercarinal areas of frons, anterior half of genae, except for two or three pale spots, coxae, abdomen, and genitalia except dorsolateral angles of pygofer, fuscous. Tegmina hyaline, veins pallid ochraceous in corium, M and Cu lightly infuscate in membrane. Wings hyaline, veins very dilute fuscous.

Anal segment of male short dorsally, deep at sides, lateroapical angles fused to form a median plate in middle line, from which arises a pair of stout sinuate spinose processes, directed ventrad. Pygofer moderately long, posterior opening about as long as broad, dorsolateral angles narrowly produced, tapering and decurved at apex, which is knob-like; diaphragm narrow at middle with dorsal margin deeply hollowed, but produced dorsocaudad at middle in an almost mitre-shaped lobe that is strongly dorsoventrally carinate along middle line; medioventral process absent. Aedeagus moderately long, tubular, correct, slightly tapering from base to near apex where it again widens; orifice dorsocaudal at apex, with two or three minute teeth set close together on its upper margin. Genital styles moderately large, styles rather strongly diverging, feebly sinuate and narrowing, sharply incurved mesad distally and acute at apex; inner margin of each style in basal third rather strongly produced caudad.

♂: length, 2.2 mm, tegmen, 2.9 mm.



FIGS. 108-116. *Syndelphax pero* sp. nov. (108) Frons and clypeus; (109) head and pronotum, dorsal view; (110) head and pronotum, lateral view; (111) tegmen; (112) male genitalia, posterior view; (113) pygofer, posteroventral view; (114) aedeagus, left side; (115) genital style, lateral view; (116) anal segment of male, posteroventral view.



Holotype, ♂. CAYMAN IS.: Grand Cayman, west end, Georgetown, 3. viii. 1938 (*Lewis & Thompson*) in B.M.(N.H.).

This species stands apart from all others of the genus in the structure of the male genitalia, but it is close to *Delphacodes argentinensis* (Muir), which is transferred to this genus below. It differs from this species in the more laterally compressed armature of the diaphragm, the more tapering aedeagus and the position of its orifice, and in the shape of the genital styles, which are not produced at the outer distal angle, but strongly so on the inner basal angle, whereas almost the opposite is to be found in *D. argentinensis*. The general form of the genitalia is not unlike that of *Toya salambo* Fenn., but the two differ in the shape of the diaphragm and of the aedeagus.

*Syndelphax argentinensis* (Muir) comb. nov.

*Delphacodes argentinensis* Muir, F., 1929, *Ann. Mag. nat. Hist.* (10) 3 : 82.

**CHIONOMUS** gen. nov.

Vertex shorter medially than broad at base (about 1 : 1.2), obtusely and evenly rounding into frons, a little narrower at apex than at base, lateral margins straight, apical margin transverse with submedian carinae slightly prominent, Y-shaped carina moderately distinct, submedian carinae uniting at apex of vertex, basal compartment of vertex wider at hind margin than greatest length (about 2 : 1); and than median length (about 2.2 : 1), frons in middle line longer than wide at widest part (about 2.2 : 1), widest at three-quarters or four-fifths from base, lateral margins straight or almost so, median carina simple: clypeus at base slightly wider than frons at apex, postclypeal disc as long as broad at base, in profile almost straight, anteclypeus in profile shallowly convex: entire clypeus in profile shallowly convex; rostrum reaching to post-trochanters, subapical segment longer than apical; antennae surpassing frontoclypeal suture, basal segment twice as long as broad, second segment longer than first (about 1.7 : 1); ocelli distinct. Pronotum with disc longer in middle line than broad at anterior margin (about 1.2 : 1), lateral carinae concave, not nearly attaining hind margin. Total length of mesonotum greater than that of scutellum (about 2.6 : 1). Post-tibial spur thin, relatively large, with 18-25 teeth.

Fuscous, occasionally lighter brown with carinae of head light ochraceous; pronotum mostly and apex of scutellum, white.

Anal segment short, unarmed or with spinose processes, if present arising ventrally near base. Pygofer with posterior opening as broad as long, dorso-lateral angles not or only little produced, ventral margin slightly excavate, diaphragm usually with a prominent round lobe or boss medially. Aedeagus tubular, usually rather short, more or less straight, ornamented with scroll-like lobes, a spine, or small teeth. Genital styles short, broad, usually constricted in middle portion and truncate apically.

Type species, *Delphacodes havanae* Muir.

Members of this genus are of rather small size (males about 3.0 mm to tip of folded tegmina) and are separable from the majority of Delphacinae by the union of the submedian carinae of the vertex at the apex of the head, not at

the base of the frons, in conjunction with a white pronotum and mesoscutellum and tegmina usually with a dark spot between the common claval vein and the commissural margin, and a relatively large and thin post-tibial spur. In the male genitalia the combined characters of a boss or lobe medially on the dorsal margin of the diaphragm and stout genital styles, constricted near the middle and more or less truncate apically are in themselves usually sufficient to permit generic recognition.

In addition to the type species, *Chionomus* includes *Delphacodes balboae* M. & G., and *Delphacodes haywardi* Muir, for which new combinations are given below.

*Chionomus havanae* (M. & G.)

*Delphacodes havanae* Muir, F. & Giffard, W. M., 1924, *Bull. Hawaiian Sug. Pirs' Ass. Exp. Sta.* 15 : 37.

1♂. CAYMAN IS. : Grand Cayman, west end, Georgetown, 27. iv. 1938  
(Lewis & Thompson).

*Chionomus balboae* (Muir & Giffard) comb. nov.

*Delphacodes balboae* Muir, F. & Giffard, W. M., 1924, *Bull. Hawaiian Sug. Pirs' Ass. Exp. Sta.* 15 : 36.

*Chionomus haywardi* (Muir) comb. nov.

*Delphacodes haywardi* Muir, F., 1929, *Ann. Mag. nat. Hist.* (10) 3 : 83.

Family DERBIDAE

*DYSIMIA* Muir

*Dysimia* Muir, F., 1924, *Proc. Hawaii. ent. Soc.* 5 : 462.

Type species, *Dysimia maculata* Muir, 1924, *ibid.* : 463.

*Dysimia numa* sp. nov.

(Figs. 117-122)

♂. Pronotum with a distinct carina from hind margin of head to tegula. Tegmina with Sc+R separate from M almost from base, Sc+R fork level with first fork of M, Sc reaching anterior margin near node. Post-tibiae with six or seven teeth apically, basal metatarsal segment with five to seven teeth, second segment with six teeth.

Pallid ochraceous, in life probably powdered with white; two parallel bands almost parallel to hind margin of pronotum, tegulae submarginally, and a light suffusion on abdominal tergites, yellowish brown. Tegmina translucent, iridescent, powdered with white, a spot at anterior margin near base, and a spot between Cu<sub>1</sub> and claval suture at same level, a larger spot overlying Cu<sub>1</sub> near apex of clavus, and a dilute suffusion overlying forks of M, fuscous. Wings translucent, iridescent, lightly powdered with white, apparently with a small fuscous spot posterior to Cu<sub>1</sub> at middle.

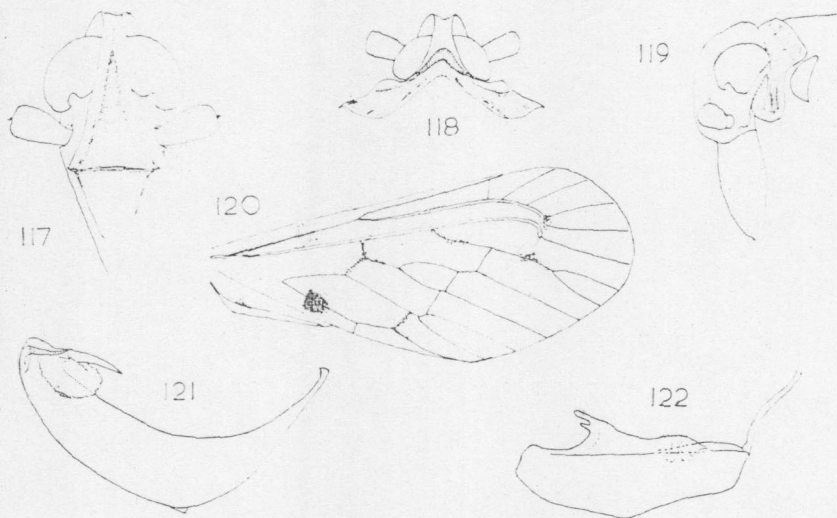
Anal segment of male in dorsal view about twice as long as broad, with lateral margins parallel and apical margin shallowly convex but abruptly excavate medially. Aedeagus rather long, shallowly curved upward distad, a pair of moderately long sinuate spinose processes arising dorsally near apex, directed cephalad and overlying aedeagus. Genital styles relatively long and

narrow, dorsal margin produced dorsad at one third from base in a shallowly convex lobe, and in a longer oblique finger-like lobe, bearing a stout spine on its posterior margin, at two thirds from base, and incurved and narrowing to a blunt point at apex.

♂: length, 1.7 mm, tegmen, 3.1 mm.

Holotype, ♂. CAYMAN IS.: Grand Cayman, north coast, north side, Hut Road, 15. vii. 1938. light trap (*Lewis & Thompson*) in B.M.(N.H.).

This species is distinguishable by Sc + R in the tegmen being separate from M from close to the base, by the pattern of tegminal markings, and by the shape of the aedeagus and of the genital styles. The structure of the tegmina is closely similar to that of *D. fuscoclypeata* Muir, but there are no evident transverse veinlets in the costal cell. It differs from *fuscoclypeata* and from *D. putilla* Fenn. in the lack of any markings on the head, and the form of the markings on the pronotum. From *D. maculata* Muir it differs widely in the position of the fork of Sc + R, and in the shape of the aedeagus.



Figs. 117-122. *Dysimia numa* sp. nov. (117) Frons and clypeus; (118) head and pronotum, dorsal view; (119) head and pronotum, lateral view; (120) tegmen; (121) aedeagus, right side; (122) genital style, lateral view.

### OMOLICNA Fennah

*Omoligna* Fennah, R. G., 1945 a. *Proc. U.S. natn. Mus.* 95 : 440.  
Type species, *Omoligna proxima* Fennah, 1945, *ibid.* : 441.

#### *Omoligna tarco* sp. nov.

(Figs. 130-134)

♂♀. Frons longer than broad (nearly 1.8 : 1), twice as wide at apex as at base.

Stramineous : mesonotum light orange-brown, median carina red. Tegmina very dilute fuscous, at least in distal half, a thin fuscous line along Sc + R. Veins otherwise paler than ground and powdered grey, crimson red near apical margin which also is red. Wings faintly infumed, veins fuscous.

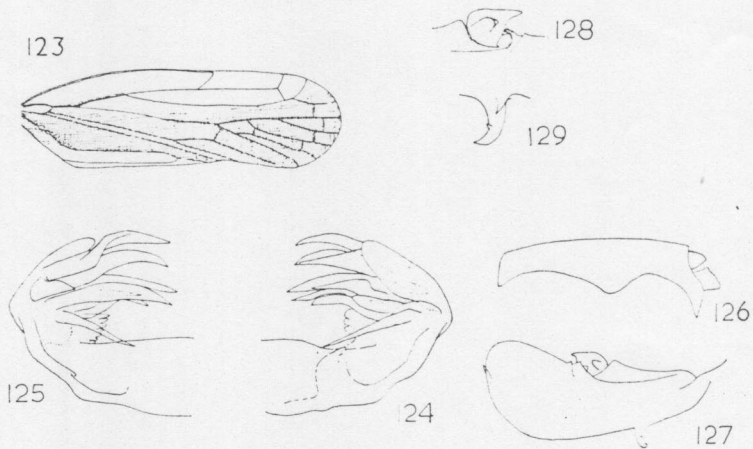
♂. Anal segment of male about twice as long as broad, apical angles each produced in a finger-like lobe. Pygofer short, with medioventral process subquadrate, with a short decurved spinose process on each side near base. Aedeagus as figured, in side view with ventral margin convex, dorsal margin of right side produced dorsolaterad in a broadly convex flange; flagellum with two broad flattened processes, acute apically, on right, a short broad decurved process medially, and four broad spinose processes on left, the uppermost twisted at its middle to lie horizontally. Genital styles with basal process of mesal margin acute apically and furnished with three peg-like teeth on upper surface; distal process of mesal margin almost as large as basal process, acute apically.

♀. Pregenital sternite of female trapezoidal, narrow distad, apical margin truncate.

♂: length, 2.0 mm; tegmen, 3.0 mm. ♀: length, 2.5 mm; tegmen, 3.3 mm.

Holotype, ♂. CAYMAN IS.: Cayman Brac, west end, cotton-wood tree land, 20. v. 1938 (*Lewis & Thompson*).

Paratype, ♀. Same data, 22. v. 1938.



FIGS. 123-129. *Omolicna nero* sp. nov. (123) Tegmen; (124) aedeagus, left side; (125) aedeagus, right side; (126) anal segment of male, left side; (127) right genital style, lateral view; (128) processes on dorsal margin of genital style; (129) process on inner (ventral) margin of genital style.

This species differs from all known Central American species in the shape of the male anal segment and of the aedeagus, and from some also in the shape of the medioventral process of the pygofer. It is perhaps nearest to *nigripennis* Caldwell, but differs in coloration, in the dentate basal process of the genital styles, and in the shape of the pregenital sternite of the female. From *O. cubana* (Myers) it differs in the apically rounded process on the dorsal margin of the genital style, this process in *O. cubana* tapering to a filament, and in the shape of the processes of the aedeagus, and from *O. puertana* Caldwell in coloration, in the shape of the medioventral process of the pygofer and in the aedeagal armature.

*Omolicna nero* sp. nov.

(Figs. 123-129)

♂♀. Frons longer than broad (1.7-1.8 : 1).

Stramineous; mesonotum orange-brown, median carina red. Tegmina greyish hyaline, traversed along middle from base to apex by a broad diffuse fuscous band. Veins concolorous, distinctly tinged with red in membrane and crimson near apical margin which also is red, Sc+R pallid. Wings greyish hyaline, veins concolorous.

♂. Anal segment of male relatively long and narrow in dorsal view, in profile with lower margin convex at middle, lateroapical angles each produced in a tapering lobe that is abruptly deflexed. Pygofer short, with medioventral process subquadrate, with a short decurved spinose process on each side near base. Aedeagus as figured, in side view with ventral margin shallowly convex, dorsal margin straight, not produced in a flange; flagellum with two lanceolate lobes on right at apex, directed cephalad, and four processes, three broad and sinuate and one, the lowest, straight, all acute distally and directed cephalad. Genital styles with basal process of mesal margin acute apically and furnished dorsally with one stout peg-like process and two minute teeth; distal process of mesal margin acute, considerably smaller than basal process.

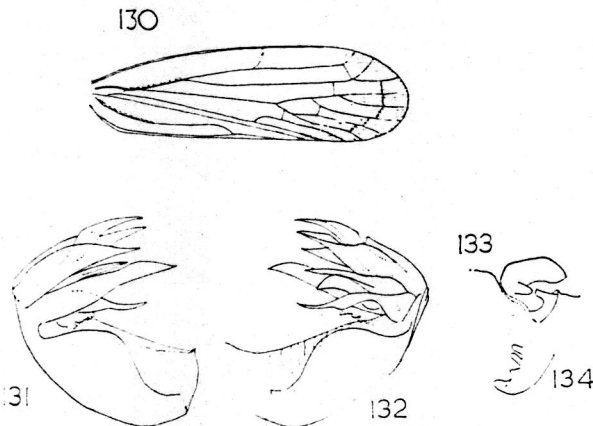
♀. Pregenital sternite of female trapezoidal, narrowing distad, apically truncate.

♂: length, 2.2 mm; tegmen, 2.8 mm. ♀: length, 2.5 mm; tegmen, 3.8 mm.

Holotype, ♂. CAYMAN IS.: Grand Cayman, north coast, north side, Hut Road, 15. vii. 1938 (*Lewis & Thompson*) in B.M.(N.H.).

Paratype, ♀. Same data, 11. vii. 1938.

This species is distinguishable from *O. tarco* by the definite fuscous band traversing the tegmina and by differences in the armature of the aedeagus. An easily observable difference that appears to be constant is that in the tegmina of *O. nero* vein Sc+R is entirely pallid, whereas in *O. tarco* it is narrowly fuscous in the basal half of the tegmen.



Figs. 130-134. *Omolicna tarco* sp. nov. (130) Tegmen; (131) aedeagus, right side; (132) aedeagus, left side; (133) processes on dorsal margin of genital style; (134) process on inner (ventral) margin of genital style.

## Family TROPIDUCHIDAE

*TANGIA* Stål

*Tangia* Stål, C., 1859, *Berl. ent. Z.* 3 : 317.

Type species, *Monopsis viridis* Walker, F., 1851, *List Homopt. Brit. Mus.* 2 : 325.

*Tangia plistoanax* sp. nov.

(Figs. 135-138)

♂♀. Vertex broader than long (1.3 : 1). Frons longer than broad (1.4 : 1). Uniformly pale green; post-tibial and post-tarsal spines black.

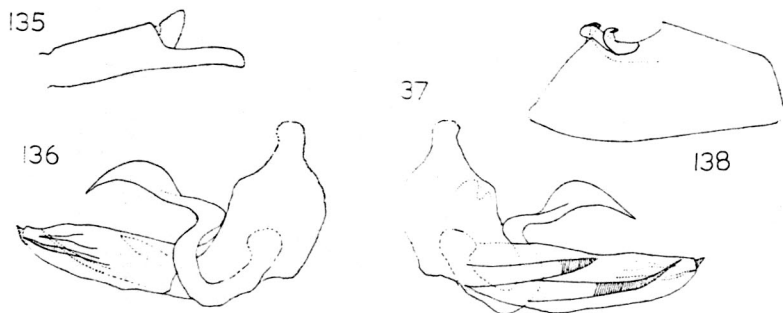
♂. Anal segment of male rather short, porrect caudad, dorsolateral angles a little produced and very slightly deflexed, apical margin shallowly concave. Pygofer with dorsolateral angles only little produced, obtusely angulate. Aedeagus as figured, tubular, laterally compressed, phallobase large, scoop-like, a small spinose process on apical margin on right below aedeagus; a large vertical sinuate process arising below aedeagus on right at base, ascending at one third from base, twisted in its apical quarter and acuminate at apex; a short broad spinose process, directed dorsocaudad, on left of aedeagus near middle; phallus membranous, in repose with four spinose processes, one long and weakly curved, directed caudad, one, on right, short and sinuate, directed caudad, one short, arising dorsally on left, directed to right and caudad, and one, very short, at apex. Genital styles as figured, with dorsal margin acutely produced at middle, a pair of curved processes near apical angle, one directed laterad at tip, the other, stouter and twice as long, curving mesad.

♂: length, 5.0 mm; tegmen, 4.6 mm. ♀: length, 5.0 mm; tegmen, 6.0 mm.

Holotype, ♂. CAYMAN IS.: Grand Cayman, south coast, south sound, 20. vi. 1938 (*Lewis & Thompson*) in B.M.(N.H.).

Paratypes, 6♂, 2♀. Same data, 17. 30. iv. 1938 north coast, north side, 13. iii. 1938; north sound, Booby Cay, 6. v. 1938; east end, 15. v. 1938; west end, Georgetown, 28. iv. 1938 (*Lewis & Thompson*).

This species is distinguished from all others of the genus by the proportions of the head and the shape of the aedeagus. It differs from *T. viridis* also in the more distinctly angulate dorsolateral angles of the pygofer, and in the attitude of the larger dorsal process of the genital styles. This, in *T. viridis* extends dorsad, whereas in *T. plistoanax* it curves mesad.



FIGS. 135-138. *Tangia plistoanax* sp. nov. (135) anal segment of male, left side; (136) aedeagus, right side; (137) aedeagus, left side; (138) right genital style, lateral view.

*TANGELLA* Metcalf & Bruner

*Tangella* Metcalf, Z. P. & Bruner, S. C., 1930, *Psyche, Camb.* 37 : 397.  
Type species, *Tangia kraatzi* Stål, C., 1859, *Berl. ent. Z.* 3 : 318.

*Tangella thestor* sp. nov.

(Figs. 139-142)

♂♀. Vertex twice as broad as long in middle. Frons longer in middle than broad (1.3 : 1), basal margin shallowly convex, with a thick callus, median carina thick, uniting distally with two thick transverse carinae parallel to frontoclypeal suture, sometimes a faint indication of one or two pustules in distal half of each compartment of frons. Tegmina nearly three times as long as broad, precostal area narrow but quite distinct, with up to ten transverse veinlets in distal half.

Uniformly green; spines on hind legs black.

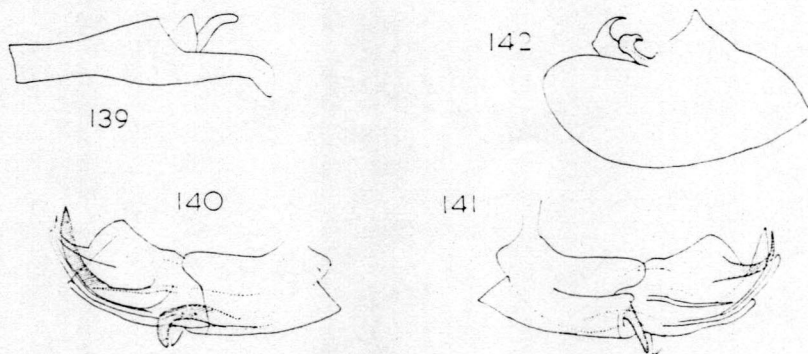
♂. Anal segment of male moderately long, in side view six times as long as broad, rather narrow, porrect caudad. Pygofer moderately long with dorsolateral angles obtusely rounded. Aedeagus moderately long, strongly compressed laterally, a narrow blade-like process on left just basad of middle, directed ventrocaudad, a strongly curved broad flattened process, also directed ventrad, on right at about same level; three pigmented spinose processes in apical half, one arising dorsally on left, curving dorsad, another arising more ventrally, ascending distad, widening and curving dorsad at apex, parallel with that on left; a slender spinose process originating near middle of aedeagus, directed caudad, not reaching apex of aedeagus. Genital styles broadly subovate, dorsal margin strongly acutely produced at one-third from base, two spinose processes, the distal one broad basally, distad of this elevation, each directed dorsad and curved cephalad at apex.

♂: length, 4.7 mm; tegmen, 6.0 mm. ♀: length, 5.5 mm; tegmen, 6.5 mm.

Holotype, ♂. CAYMAN IS.: Grand Cayman, west end, Georgetown, 30. iv. 1938 (*Lewis & Thompson*) in B.M.(N.H.).

Paratypes, 4♂, 4♀. CAYMAN IS.: Little Cayman, south coast, south town, 30. v., 2-6. vi. 1938: east end, interior of Muddyfoot Point; light trap on bluff, 7. vi. 1938 (*Lewis & Thompson*).

1♂, 2♀: Cayman Brac, east end, Spot Bay, 24. v. 1938; west end, cotton-tree land, 21. v. 1938; north coast, Stakes Bay, 20. v. 1938 (*Lewis & Thompson*).



Figs. 139-142. *Tangella thestor* sp. nov. (139) Anal segment of male, left side; (140) aedeagus, right side; (141) aedeagus, left side; (142) right genital style, lateral view.

Males from the three Cayman Islands show a high degree of uniformity, even in minute details of genital structure.

This species is clearly very close to the Jamaican *T. pustulifrons* Fenn., but it differs in the absence of definite pustules from the frons, in the presence of transverse veinlets in the precostal area of the tegmen, and in structural details of the male genitalia. Of the last, the most evident are in the shape of the spinose process medially on the left side, and the relative shortness of the innermost process that arises at the middle and does not extend as far as the margin: this, in *T. pustulifrons*, ascends distad and amply surpasses the margin. The basal lobe on the dorsal margin of the genital styles is acute in *T. thestor* but obtuse in *T. pustulifrons*.

The forms of the vertex and thorax of *Neurotmeta breviceps* Metc. and Bruner are of broadly similar pattern to those of the present species, but the pronotum of *breviceps* is longer than the vertex, both measured along the middle, whereas it is shorter than the vertex (1 : 1.2) in *T. thestor*. In addition, M is three-branched before the nodal line in *N. breviceps* whereas it is two-branched in *T. thestor*.

*Tangella dictys* sp. nov.

(Figs. 143-147)

♂. Vertex broader than long in middle (2.2 : 1). Frons longer in middle than broad (about 1.2 : 1), basal margin shallowly convex, with a thick callus, median carina thick, uniting distally with two thick transverse carinae parallel to frontoclypeal suture, three pustules in distal half of each compartment of frons. Tegmina longer than broad (2.8 : 1), apical margin rather broadly rounded, precostal area narrow but distinct, with ten to thirteen weak transverse veinlets.

Stramineous (but undoubtedly uniformly green in life); spines on hind legs black.

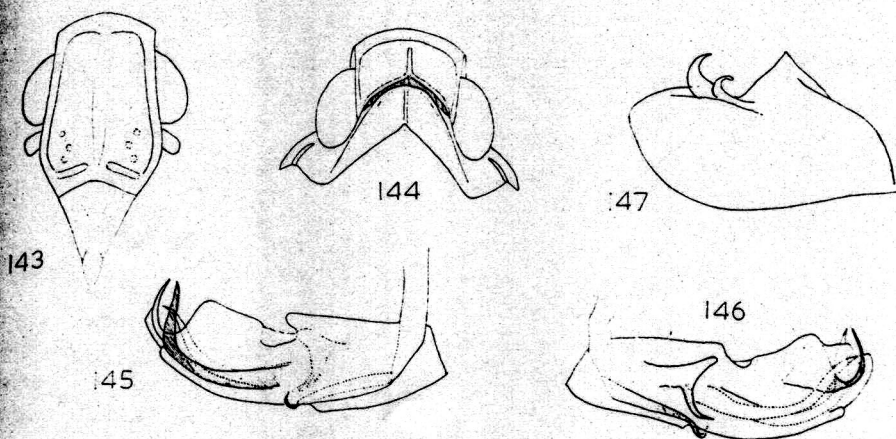
Anal segment of male moderately long, rather narrow, porrect caudad. Pygofer moderately long with dorsolateral angles obtusely rounded. Aedeagus moderately long, strongly compressed laterally, a long tapering process at base ventrally, directed caudad, rather abruptly deflexed and curved below aedeagus to right near its apex, a short curved spinose process on left at basal third, directed ventrocaudad; three pigmented spinose processes in apical half, one arising dorsoapically on left, strongly curving dorsad, another arising more ventrally near middle, ascending distad, slightly widening and curved dorsad at apex; a moderately stout spinose process originating near middle of aedeagus, directed caudad and ascending distad, not quite attaining apex of aedeagus. Genital styles broadly subovate, dorsal margin strongly rectangulately produced at two-fifths from base, two spinose processes, the outer broad basally, distad of this elevation, each directed dorsad and curved cephalad at apex.

♂: length, 6.0 mm; tegmen, 6.8 mm.

Holotype, ♂. HAITI: Grand Goave, vii. 1961 (*J. Maldonado C.*) in coll. Maldonado C.

This species is close to *T. pustulifrons* but differs in the fewer pustules on the frons, and the presence of transverse veinlets in the precostal area, and in structural details of the male genitalia. From *T. thestor* it is readily separable by the relatively wider vertex and wider tegmina.





FIGS. 143-147. *Tangella dictys* sp. nov. (143) Frons and clypeus; (144) head and pronotum, dorsal view; (145) aedeagus, right side; (146) aedeagus, left side; (147) right genital style, lateral view.

### TANGYRIA Uhler

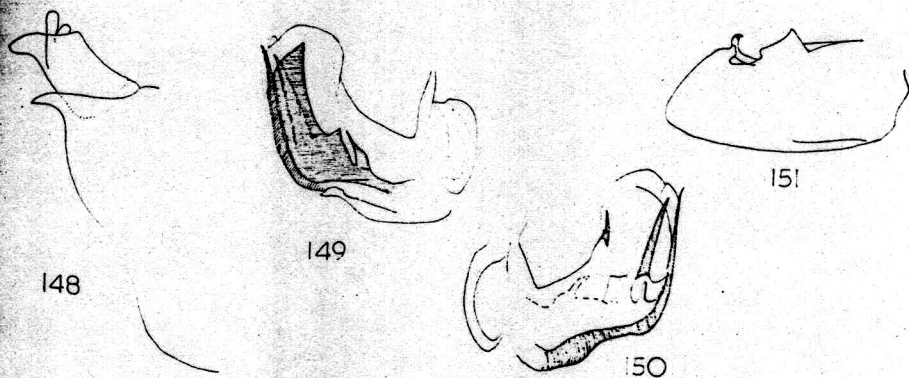
*Tangyria* Uhler, P. R., 1901, *Proc. ent. Soc. Wash.* 4 : 512.

Type species, *Tangyria frontalis* Uhler, 1901, *ibid.* : 512.

### *Tangyria frontalis* Uhler

(Figs. 148-151)

The opportunity is taken here of figuring the male genitalia of this endemic Haitian species. The figure is based on a male labelled HATTI: Kenscoff, 1-6. viii. 1961 (*J. Maldonado C.*) in coll. Maldonado C.



FIGS. 148-151. *Tangyria frontalis* Uhler. (148) Anal segment of male and pygofer, right side; (149) aedeagus, right side; (150) aedeagus, left side; (151) genital style, lateral view.

### Family ISSIDAE

### ACANALONIA Spinola

*Acanalonia* Spinola, M., 1839, *Annls Soc. ent. Fr.* 8 : 447.

Type species, *Acanalonia serrillei* Spinola, 1839, *ibid.* : 448.

*Acanalonia caymanensis* sp. nov.

(Figs. 152-157)

♂. Closely similar in general form to *Acanalonia pumila* Van Duzee. Vertex not produced, sloping evenly into frons. ecarinate; frons broader than long in middle (1.6 : 1), transversely convex, ecarinate, but with three broad linear elevations, very obscure, converging on apex of middle line. Tegmina longer than broad (1.3 : 1), apical and anal angles broadly rounded and apical margin distinctly convex. Post-tibiae with eight spines apically, basal metatarsal segment with two spines and eight teeth between them.

Uniformly green; spines on post-tibiae black.

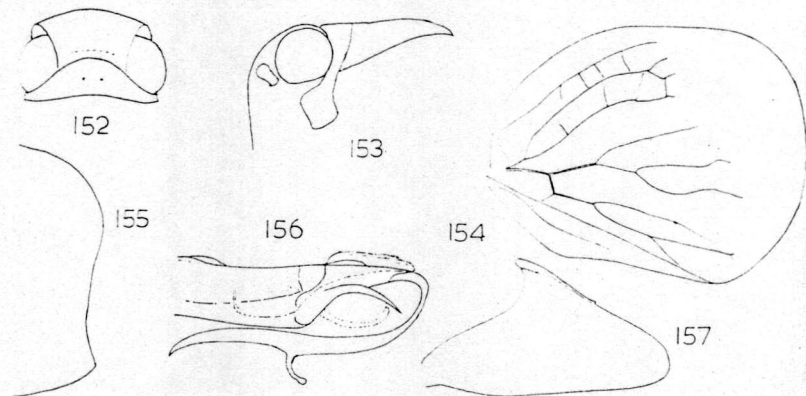
Anal segment of male relatively short, apical margin convex; lateral margin in side view straight. Pygofer with lateral margins sinuate, dorso-lateral angles broadly convex, not much produced. Aedeagus as figured, inner pair of processes spinose and curved slightly ventrad distally; outer pair of processes recurved below aedeagus to its base, each process acuminate apically and bearing at middle a moderately long slender curved process, expanding slightly at its apex into a small knob; median membranous flange moderately broad in side view, bluntly rounded at apex. Genital styles sub-triangular, with dorsal margin from base to dorsal process shallowly sinuate and relatively long, the dorsal process lying at about two-fifths of length of style from base.

♂: length, 2.7 mm; tegmen, 2.8 mm.

Holotype, ♂. CAYMAN IS.: Grand Cayman, north coast, north side, 17. vii. 1938 (*Levis & Thompson*), B.M.(N.H.). 1967-147.

Paratypes, 1♂. Same data; 1♂, Little Cayman, east end, interior, Muddyfoot's area, 6. vi. 1938.

This species differs from the Jamaican *A. plana* V.D. in the proportions and shape of the tegmina. It is close to *A. pumila* V.D., but differs in genital characters; in the aedeagus the inner pair of processes is decurved distally, whereas in *pumila* the processes are stouter and curve laterad as well as ventrad; each of the outer pair of processes is stouter than in *pumila*, is furnished with a relatively longer lateral process at its middle and is acute apically, not



FIGS. 152-157. *Acanalonia caymanensis* sp. nov. (152) Head and pronotum, dorsal view; (153) frons, pronotum and mesonotum, lateral view; (154) tegmen; (155) pygofer, left side; (156) aedeagus, left side; (157) left genital style, lateral view.

distinctly knob-like as in *pumila*; the median submembraneous flange in lateral view is much broader than in *pumila* and is bluntly rounded apically, not acute; in the genital styles the greatest width occurs at about two-fifths of the length of the style from the base, whereas in *pumila* it occurs at about one-fifth.

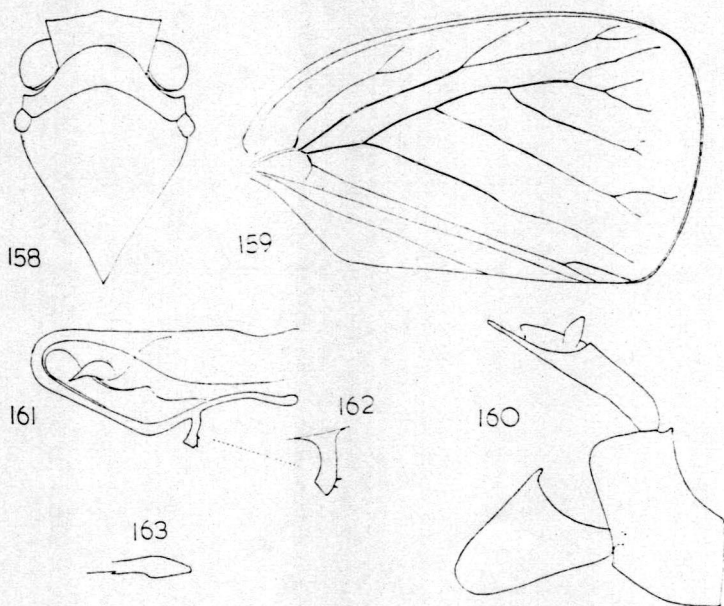
*Acanalonia consors* sp. nov.

(Figs. 158-163)

♂♀. Generally similar to *Acanalonia robusta* (Wlk.). Vertex in dorsal view broader anteriorly than long in middle (3.2 : 1), anterior margin shallowly obtusely angulate, lateral margins converging basad, median carina present; frons broader than long in middle (2.2 : 1) and than greatest length (1.3 : 1), transversely slightly convex, medially carinate throughout. Mesonotum longer than broad (1.2 : 1). Tegmina longer than broad (broadest 1.7 : 1), apical angle slightly more narrowly rounded than anal angle, apical margin weakly convex. Post-tibiae with seven spines apically, basal metatarsal segment with two spines and six to eight teeth between them.

Green (fading to stramineous); protibiae and mesotibiae yellowish brown speckled with white. Tegmina green with a row of fine piceous dashes adjoining apical margin.

♂. Anal segment of male moderately long, apical margin convex, lateral margins converging distad of anal foramen, lower margin in side view almost straight, slightly decurved distally. Pygofer with lateral margins straight, dorsolateral angles broadly rounding through a little more than 90 degrees. Aedeagus as figured, with inner pair of processes sinuate, broadly dilated in



Figs. 158-163. *Acanalonia consors* sp. nov. (158) Head and thorax, dorsal view; (159) tegmen; (160) anal segment, pygofer and genital style, right side; (161) aedeagus, right side; (162) shorter branch of outer process of aedeagus, more enlarged; (163) apical part of dorsal margin of genital style, dorsal view.

distal half, acute at apex; outer pair of processes recurved below aedeagus to its base, angulately bent near middle, each process bluntly knob-like at apex and bearing at middle a moderately long flattened process directed latero-ventrad, dilated and obliquely truncate at its tip and with two minute spines near apex; median membranous vertical flange slightly expanding distad, rounded apically. Genital styles as figured.

♀. Pregenital sternite of female slightly produced caudad at middle in a shallowly convex lobe.

♂: length, 6.0 mm; tegmen, 8.0 mm. ♀: length, 7.9 mm; tegmen, 9.0 mm.

Holotype, ♂. CAYMAN IS.: Grand Cayman, west end. Georgetown, 1. v. 1938, light trap (*Lewis & Thompson*), in B.M.(N.H.).

Paratypes, 2♂, 3♀. Grand Cayman, Georgetown, 27–29. iv. 1938; north coast, north side, 13, 15, vii. 1938, light trap B; south coast, south sound, 17. vi. 1938 (*Lewis & Thompson*).

This species differs from the Jamaican *A. robusta* Wlk. in the proportions of the vertex and the mesonotum, and in details of aedeagal structure. The anterior margin of the vertex of *A. robusta* in dorsal view is markedly angulate, and the median carina of the vertex and frons is well defined and at the point of curvature thickened to twice its normal width. In *A. consors* the anterior margin of the vertex is more weakly and less distinctly angulate and the median carina is weaker and finer, and at most with only a faint trace of thickening at the point of curvature. The most evident differences in the aedeagus are the greater degree of dilation of the inner pair of processes, and the bispinose and obliquely truncate apex of the secondary process on each of the outer pair of processes.

### *Acanalonia servillei* Spinola

(Figs. 168–171)

*Acanalonia servillei* Spinola, M., 1839, *Annls Soc. ent. Fr.* 8 : 448.

*Poeciloptera latifrons* Walker, F., 1851, *List Homopt. Brit. Mus.* 2 : 457.

*Poeciloptera complanata* Walker, 1851, *ibid.* : 461. **Syn. nov.**

This species was described on the basis of a male of body length 5.3 mm (2.5 lignes), body width 2.1 mm (1 ligne) and a tegminal length of about 8.5 mm (4 lignes), and is figured (pl. 16, figs. 2A–C) as having a vertex with the anterior margin obtusely and abruptly angulate, and medially carinate and tegmina that are widest near the middle and a costal margin that is strongly curved in the basal half. The colour of both body and tegmina is green. The type locality was given as "Philadelphie". Guérin-Ménéville (1856, *Homopteres. Hist. nat. Cuba*, 7 : 181) included Cuba in the range of distribution of the species; Uhler (1895 : 73) added St. Vincent, W.I., and Melichar (1902 : 186) assigned to this species broadly similar specimens from Para, and cited Jamaica, Cuba and Florida as other areas in which it occurred. In 1927, Wolcott used this name with reference to a species in Haiti.

Metcalf (in Metcalf & Bruner, *Psyche, Camb.* 1930 : 407) recognized *A. latifrons* Wlk. as a species of a total length (apex of head to apex of folded tegmina) of 13–15 mm, and with a tegmen that is wider at two-thirds from the base than it is at the level of the claval apex, and *A. servillei* as a species of 14–15 mm total length, and with a tegmen that is not wider at two-thirds

from the base than it is at the claval apex. Doering (1932, *Ann. ent. Soc. Am.* 25: 764) based her interpretation of *A. servillei* and her figures (p. 1932, pls. I, III, and IV) on a female specimen from Cuba borrowed from Metcalf.

This re-definition of the concept as applying to a species 13-15 mm in total length is wholly unjustifiable, as the measurements of the length of the body and of the tegmen given by Spinola clearly show that the total length of his male specimen when the tegmina were folded must have been 9.5 mm which is the average for a male of *A. latifrons* Wlk. (of which the female holotype (from New Orleans) has a body length of 7.5 mm and a tegminal length of 9.8 mm). Moreover, Spinola's description and figure make it clear that in his type the anterior margin of the vertex was abruptly angulate medially and the median carina, both of the vertex and of the frons, was strong. In contrast to this, the specimens of *Acanalonia* that exceed a total length of 13 mm, have a vertex with a rounded or subangulate anterior margin, and a median carina that is relatively weak and sometimes almost absent, are found only in Cuba as far as can be ascertained from collections and from literature.

On the basis of the limited series available to him, the writer recognises a number of distinct, geographically separated, populations of *servillei*-like forms that can be separated by the following key, and considers that until they can be studied by means of interbreeding trials they are best regarded as species.

Two terms used in the key require explanation: the *lower edge* of the costal margin of the tegmen is a narrow flange, inflected mesad from the costa, that begins near the base of the costa and tapers off near the middle of the anterior margin; the *inner edge* of the commissural margin is a narrow vertical flange that, in the folded tegmen, extends downward from the commissural margin. The two inner edges are apposed when the tegmina are folded, and cannot be seen.

Key to the *A. servillei* complex

- 1 (2) Inner edge of commissural margin dark brown. Profemora mostly brown, speckled with white or pale brown. Haiti . . . . . *phorceys* \*
- Inner edge of commissural margin white or concolorous with tegmen. Profemora at most infusate only near apex . . . . . 2
- 2 (1) Tegmina with lower edge of costal margin extending mesad almost at right angles to margin, very shallowly concave, costa viewed edgewise thus appearing broad; anterior margin of vertex not abruptly angulate at middle. Posterolateral impressions of mesonotum in female concolorous with ground. Cuba . . . . . *ingens* \*
- Tegmina with lower edge of costal margin reflected inward to form an acute angle with margin, costa viewed edgewise thus appearing wedge-like or knife-edged; anterior margin of vertex abruptly angulate at middle. Posterolateral impressions of mesonotum brown in both sexes . . . . . 3
- 3 (2) Median carina of vertex strongly thickened at point of curvature into frons. Tegmina with anal angle strongly rounding almost through 90 degrees; submarginal dashes black, conspicuous. Jamaica . . . . . *robusta* Walker
- Median carina of vertex at most only slightly thickened at point of curvature into frons. Tegmina with anal angle obtusely rounding; submarginal dashes not markedly conspicuous. U.S.A. . . . . *servillei* Spinola

\* Described as new overleaf.

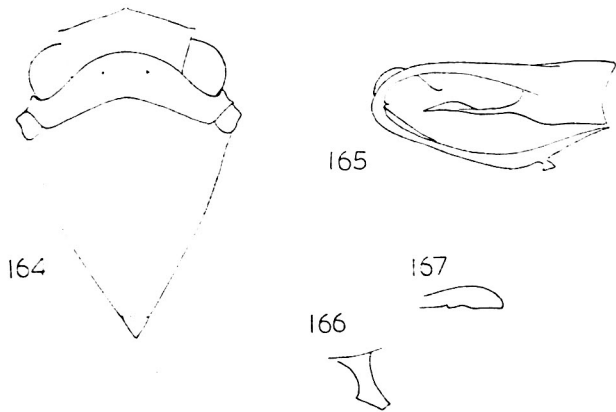
*Acanalonia complanata* (Wlk.), described from an unknown locality, is represented in the B.M.(N.H.) by two specimens, one bearing the label "type" and two labels "1959" " *Pocilloptera complanata* ", the other a label "68.4" (1868, from the collection of W. Wilson Saunders). The specimen marked "type" is here designated as the lectotype, and has been so labelled. The two specimens are conspecific, and the type is a female. The tegmina are each 10 mm long and 6 mm wide, and their shape, like that of every other feature of the body, agrees with that of *A. latifrons*. The two types differ only in the following particulars: in *A. latifrons* the cell between the posterior claval vein and the commissural margin of the tegmen is slightly wider than in *A. complanata*; in the wing of *A. latifrons* the post-cubital vein (and the membrane adjoining it) is very faintly tinged with brown, whereas in *A. complanata* it is entirely pallid like the other wing-veins: the first valvifer of *A. latifrons* has a conspicuous quadrate black spot at its dorsoapical angle, but that of *A. complanata* has only the rim of the dorsoapical angle narrowly infuscate. These differences are not considered sufficient to justify these two nominal species being kept apart.

*Acanalonia ingens* sp. nov.

(Figs. 164–167)

*Acanalonia servillei* Metcalf, Z. P., & Bruner, S. C., 1930, *Psyche, Camb.* 37 : 407.

♂♀. Vertex in dorsal view broader anteriorly than long in middle (about 2.8 : 1), anterior margin round or subangulate, median carina usually weak; frons broader than long in middle (about 1.6 : 1) and than greatest length (1.1 : 1), median carina feeble. Head, pronotum and anterior portion of mesonotum strongly declivous; mesonotum longer than broad (about 1.2 : 1). Tegmina longer than broad (about 1.6 : 1), anterior margin almost straight in distal half, lower edge of costa produced mesad as a shallowly sulcate flange at right angles to margin, thus making costa appear thick and quadrate in ventral view.



FIGS. 164–167. *Acanalonia ingens* sp. nov. (164) Head and thorax, dorsal view; (165) aedeagus, right side; (166) shorter branch of outer process of aedeagus, more enlarged; (167) part of dorsal margin of genital style, dorsal view.

Green: fore and middle legs with femora apically, and tibiae and tarsi, brown, mottled with paler spots: tegmina with lower edge of costal margin and inner edge of commissural margin, ivory-white: submarginal row of linear marks fine, not strongly pronounced.

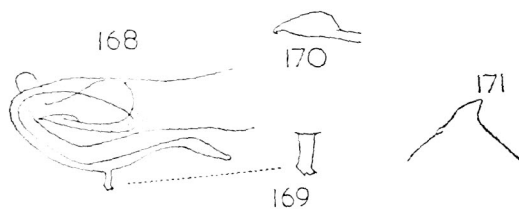
♂. Male genitalia as figured.

♂: length, 7.5 mm; tegmen, 10.0 mm. ♀: length, 8.7 mm; tegmen, 12.0 mm.

Holotype, ♂. CUBA: Soledad, 2. viii. 1929 (*J. C. Myers*), B.M. 1930-190, in B.M.(N.H.).

Paratype, ♀. CUBA: Soledad, 9. ix. 1929 (*J. G. Myers*), B.M. 1930-190.

In the male genitalia the secondary processes of the outer (ventral) processes are directed almost laterad, whereas in *A. servillei* they are relatively longer and directed ventrolaterad.



FIGS. 168-171. *Acanalonia servillei* Spinola. (168) Aedeagus, right side; (169) shorter branch of outer process of aedeagus, more enlarged; (170) apical portion of inner process of aedeagus, more enlarged, slightly dorsolateral view; (171) apical portion of dorsal margin of genital style, lateral view.

*Acanalonia phorcys* sp. nov.

(Figs. 172-175)

♂♀. Vertex in dorsal view broader anteriorly than long in middle (about 3.6 : 1), anterior margin shallowly convex or feebly subangulate, median carina weak: frons broader than long in middle (nearly 1.5 : 1), and than greatest length (1.1 : 1), median carina feeble. Head, pronotum and anterior portion of mesonotum moderately declivous, mesonotum longer than broad (about 1.1 : 1). Tegmina longer than broad (1.7 : 1), anterior margin almost straight in distal half, lower edge of costa produced mesad as a shallowly sulcate flange at a slightly acute angle to margin, thus making costa appear thick in ventral view.

Green: femora of fore and middle legs for most of length anteriorly, tibiae and tarsi, brown, femora and tibiae mottled with paler spots: posterolateral impressions usually pale yellowish brown. Tegmina green, area between posterior claval vein and commissural margin faintly tinged with yellowish brown, inner edge of commissural margin usually dilute fuscous: submarginal dashes at apical margin fine, dark reddish brown or piceous.

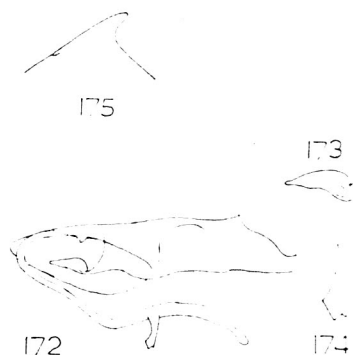
♂. Male genitalia as figured.

♂: length, 7.2 mm; tegmen, 10.1 mm. ♀: length, 7.5-8.0 mm; tegmen, 10.0-10.5 mm.

Holotype, ♀. HAITI: Port au Prince, v. 1925 (*G. N. Wolcott*), Acc. 366-25, in B.M.(N.H.).

Paratypes, 1♂, 4♀. HAITI: same data; Kenscoff, 1-6. viii. 1961 (*J. Maldonado C.*).

Apart from the infuscate inner edge of the posterior margin of the tegmina, the most evident feature that characterizes this species is the unusually large extent of the brown area on the profemora and mesofemora, which, at least anteriorly, are lightly suffused with brown almost to the base, the brown being mottled with lighter spots, as on the darker tibiae. The species is separable from *A. serrillei* and *A. ingens* by the more transverse vertex and the relatively narrower tegmina. From *A. sublinea* Wlk. from Santo Domingo the present species is well distinguished by its greater size, and by tegminal coloration; in *A. sublinea* the area between the posterior claval vein and the commissural margin is light brown and traversed by white veinlets, whereas in *A. phoreys* it is green faintly tinged with orange-brown distally, and devoid of pallid transverse veinlets. The Haitian *A. viridis* Melichar is of the same size as *A. sublinea*.



FIGS. 172-175. *Acanalonia phoreys* sp. nov. (172) Aedeagus, right side; (173) apical portion of inner process of aedeagus, more enlarged, slightly dorsolateral view; (174) shorter branch of outer process of aedeagus, more enlarged; (175) apical portion of dorsal margin of genital style, lateral view.

#### *Acanalonia robusta* (Walker)

*Poeciloptera robusta* Walker, F., 1851, *List Homopt. Brit. Mus.* 2: 449.

*Poeciloptera quadrata* Walker, 1851, *ibid.*: 460.

*Poeciloptera lata* Walker, 1851, *ibid.*: 462.

Walker's type is from Jamaica, and members of the population from which it comes have the following features.

Median carina of vertex and frons strongly developed, thickening slightly at point of curvature into frons, and usually thickening slightly near junction with clypeus. Vertex with anterior margin abruptly obtusely angulate. Tegmina with anal angle rather abrupt, almost rectangular, about three cells between claval apex and maximum curvature of anal angle; submarginal dashes at apical margin black, conspicuous, and clearly extending between claval suture and  $Cu_1$  at apex of clavus, so producing a linear black spot at tip of clavus. Wing with apical angle between Sc and R, but point of maximum curvature nearer to R, which does not quite enter it.

On the basis of these characters, in addition to their close agreement in other details, the present writer is satisfied that the type female of *Poeciloptera quadrata* Wlk. from Jamaica, and the type male of *Poeciloptera lata* Wlk. from an unspecified locality are from the same population, and that the names are synonymous with *robusta*, which has page priority.



The anal segment of the female of *A. robusta* is relatively narrower basally than that of Cuban females of *A. ingens*, and the lateral margins are evenly curved throughout, not shallowly sinuate as in *ingens*. From the anal segment of the female of *A. latifrons* it differs in being relatively narrower. *A. robusta* also stands apart from *A. servillei* and *A. latifrons* in the abrupt rectangular curvature of the anal angle of the tegmen.

## Family FLATIDAE

*CYARDA* Walker

*Cyarda* Walker, F., 1858. *List Homopt. Brit. Mus. Suppl.* 1858 : 121.  
Type species, *Cyarda difformis* Walker, 1858, *ibid.* : 121.

*Cyarda capys* sp. nov.

(Figs. 176–181, 183–185)

♂♀. Vertex broader than long in middle line (1.8 : 1): frons scarcely longer in middle line than broad (about 1.05 : 1). Tegmina with apical angle very acutely rounded, apical margin very oblique, shallowly concave, anal angle fairly distinct, obtusely subangulate.

Tawny yellow; base of frons, dark castaneous, median areas of pronotum and mesonotum, reddish brown. Tegmina tawny in basal half, infuscate in distal half, about five small spots in costal cell in second quarter of tegmen, humeral eminence and an oblique stripe behind it, four or five ovate spots widely spaced between  $Cu_1$  and M in corium, and an irregular suffusion across cells Sc+R and M at middle. intervals between granules at base of clavus and a mark near each group of granules in distal half of clavus, dark castaneous, almost black. Tegmina sometimes almost uniformly pale, with only spots in costal cell and between  $Cu_1$  and M dark.

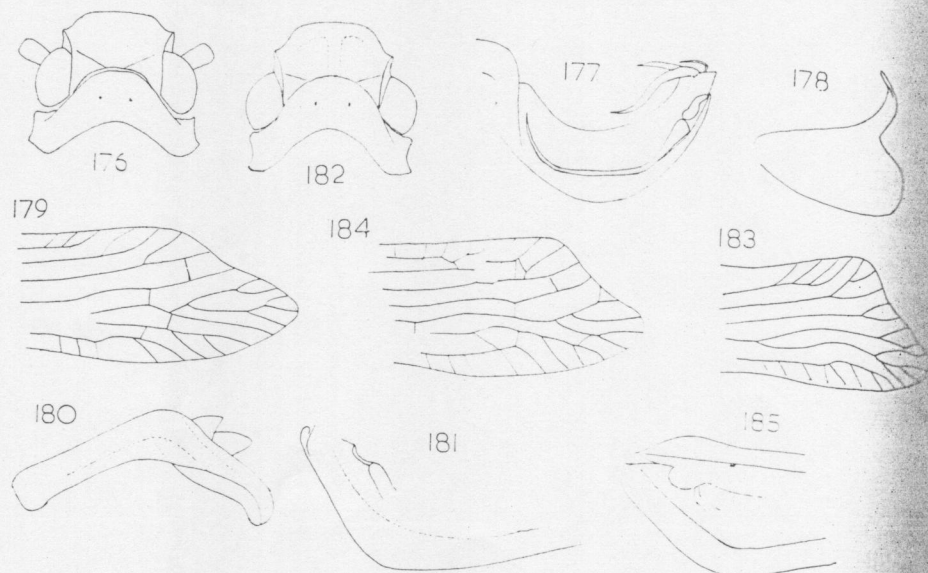
♂. Anal segment of male rather long, narrow, deflexed through 70 degrees in apical half. Aedeagus with a deep ventral keel and with three pairs of spinose processes arising dorsally at apex, the apical pair rather short, very slender, directed dorsad then rather abruptly curving cephalad, the inner pair moderately short, stout, directed cephalad, the outer pair rather more than twice as long as the inner, and sinuately curved mesocephalad; a pair of long spinose processes arising laterally at apex, shallowly curved and parallel to ventral margin of aedeagus in its basal third, then directed cephalad almost straight, and finally shallowly curving dorsocephalad, reaching to basal eighth of aedeagus.

♀. Anal segment of female rather narrowly ovate in dorsal view. Third valvulae of ovipositor armed distally with 12 teeth.

♂: length, 3.9 mm; tegmen, 6.5 mm. ♀: length, 4.0 mm; tegmen, 7.5 mm. Holotype, ♂. CAYMAN Is.: Grand Cayman, west end, Georgetown, 30. iv. 1938 (*Lewis & Thompson*), in B.M.(N.H.).

Paratypes, 2♂, 3♀. Same data, 15, 22, 30. iv. 1938; north coast, north side, Hut Road, 15. vii. 1938; Rum point, 6. v. 1938 (*Lewis & Thompson*).

This species is close to *C. monae* Fennah (fig. 182) from Jamaica, but differs in the relatively broader frons, and in details of aedeagal armature. These include the prominent apical processes, the distinctly sinuate form of the outer pair of apical processes and the differently shaped lateral processes.



Figs. 176-185. *Cyarda capys* sp. nov. (176) head and pronotum, dorsal view; (177) aedeagus of male, left side; (178) left genital style; (179) apex of tegmen of typical subspecies; (180) anal segment of male, left side; (181) basal half of costal margin of tegmen of typical subspecies, *Cyarda monae* Fennah. (182) Head and pronotum, dorsal view; *Cyarda capys* sp. nov. (183) Apex of tegmen of *C. capys periphias* subsp. nov. (from Cayman Brac); (184) apex of tegmen of *C. capys periphias* (from Little Cayman); (185) basal half of costal margin of tegmen of *C. capys periphias* (from Little Cayman).

*C. capys periphias* subsp. nov.

(Figs. 183-185)

Size and general form as in typical subspecies. Tegmina with anal angle distinctly produced and angulately rounding and apical margin distinctly concave as figured.

Holotype of subspecies, ♀. CAYMAN IS.: Cayman Brac, interior, behind Stakes Bay, light trap on bluff, 22. v. 1938 (*Lewis & Thompson*), in B.M. (N.H.).

Paratype, 1♀. CAYMAN IS.: Little Cayman, east end, interior of Muddy foot Point, 7. vi. 1938, light trap on bluff (*Lewis & Thompson*).

These two specimens stand well apart from the series of the typical subspecies, in which the apical angle of the tegmen is markedly more acute and the anal angle is relatively feebly prominent. There is a slight difference in the shape of the tegmen between them, that from Cayman Brac having a less obtuse anal angle than that from Little Cayman. If, when more material is available, it is found that these are population differences and not individual differences, the population on Little Cayman will merit recognition as a further subspecies.

*FLATOIDINUS* Melichar

*Flatoidinus* Melichar, L., 1923, *Genera Insect.* 182: 117.

Type species, *Poeciloptera conviva* Stål, C., 1862. *Handl. svenska Vet. Akad.* 3 (6): 13.

*Flatoidinus lictor* sp. nov.

(Figs. 186-192)

♂♀. Vertex broader than long (2:1), obtusely subangulate anteriorly, sides of head in lateral view shorter than eye, only slightly acutely angulate

anteriorly with ante shallowly third, then rounded to one-third of transverse tibiae with Light g marked with light reddish

♂. Anal ventrad in face caudal of these, very sinuate narrow pair of s directed dorsally curving about length; a pair directed cep Genital style margin oblique near apex.

♂: length Holotype 15. vii. 1938

Paratypes 1938; west end (*Lewis & Thompson*) behind Stakes

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Figs. 186-192. *Flatoidinus lictor* sp. nov. and clypeus; (187) dorsal view; (190) anal segment of male; (191) right genital style

anteriorly; frons longer than broad (1.1 : 1), medially ecarinate. Pronotum with anterior margin convex, almost transverse medially, posterior margin shallowly excavate. Tegmina with costal margin strongly convex in basal third, thence almost straight, apical margin convex, sutural angle more strongly rounded than apical angle, costal area about twice as wide as costal cell at one-third from base, apical line of cross veinlets uneven but distinct, nodal line of transverse veinlets from stigma to apex of clavus regular, convex. Post-tibiae with two spines laterally.

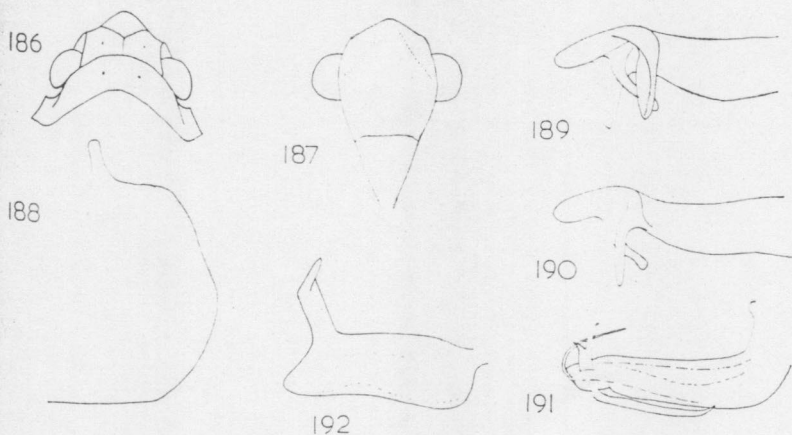
Light green, heavily powdered with pinkish grey, lightly and variably marked with black spots or short stripes; veins concolorous. Wings dilute light reddish brown, veins concolorous.

♂. Anal segment of male tubular in basal three-quarters, strongly produced ventrad in apical quarter in a pair of subtriangular lobes that are twisted to face caudad, and consequently appear narrow in lateral view; between bases of these, ventral surface of segment strongly produced ventrocephalad in a sinuate narrow spatulate process. Aedeagus tubular, slightly narrowing distad, a pair of short flattened processes, distally bifurcate, dorsally near apex, directed dorsad; a pair of slender filamentous processes arising at apex, curving above aedeagus and directed cephalad for almost a quarter of its length; a pair of broad, subensiform, processes arising ventrally near apex, directed cephalad and lying close against aedeagus, slightly upcurved at tip. Genital styles rather narrow, with dorsal and ventral margins parallel, apical margin oblique, apical process long, rather broad, twisted and slightly recurved near apex.

♂: length, 5.0 mm; tegmen, 7.0 mm. ♀: length, 7.8 mm; tegmen, 9.0 mm.

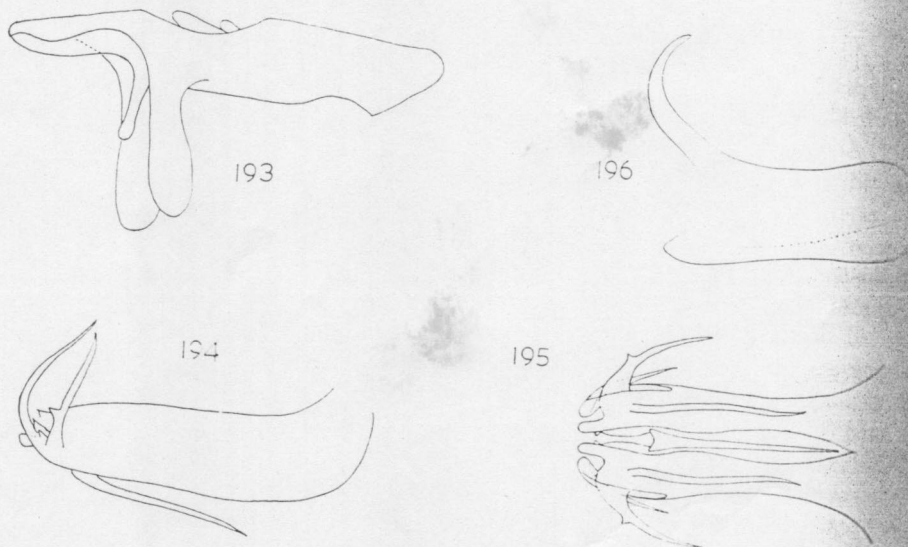
Holotype, ♂. CAYMAN IS.: Grand Cayman, north coast, north side, 15. vii. 1938 (*Lewis & Thompson*), in B.M.(N.H.).

Paratypes, 5♂, 5♀. Grand Cayman, south coast, south sound, 17-20. vi. 1938; west end, Georgetown, 26, 30. iv., 3, 17. viii. 1938; east end, 30. vi. 1938 (*Lewis & Thompson*); Cayman Brac, north coast, Stakes Bay, 20. v. 1938; behind Stakes Bay, 22. v. 1938 (*Lewis & Thompson*).



Figs. 186-192. *Flatoidinus lictor* sp. nov. (186) Head and pronotum, dorsal view; (187) frons and clypeus; (188) pygofer, left side; (189) anal segment of male, right side, posterolateral view; (190) anal segment of male, right side, lateral view; (191) aedeagus, right side; (192) right genital style.

This species is closely allied to *F. acutus* Uhl., *F. obscurus* Metc. & Bruner and *F. punctatus* Wlk. (figs. 193-196). It is separable from *F. acutus* and *F. punctatus* by the relatively longer median process on the ventral surface of the anal segment, and from *F. obscurus* in the relatively longer apical pair of processes of the aedeagus, the stouter ventrolateral processes, and the differently proportioned bifurcate processes.



FIGS. 193-196. *Flatoidinus punctatus* Walker. (193) Anal segment of male, right side, posterior lateral view; (194) aedeagus, right side; (195) aedeagus, ventral view; (196) right gonostyle (figures drawn from holotype by Dr. W. E. China).

### Summary

The Fulgoroidea collected in the Cayman Islands by the Oxford University Biological Expedition of 1938 are enumerated, and comprise 17 genera and 22 species, of which one genus, 16 species and one subspecies are new, in the families Cixiidae, Delphacidae, Derbidae, Tropiduchidae, Issidae and Flatidae. Descriptions are also given of a new subgenus and nine new species of Cixiidae, a new species of Tropiduchidae and two new species of Issidae from Cuba, Jamaica and Haiti. The fauna is closely related to those of Cuba and Jamaica, but contains two elements, the genus *Nymphocixia* (Cixiidae) and a species of *Syndelphax* (Delphacidae), that are unknown in other islands of the West Indies.

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