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**A monograph of Christmas Island (Indian Ocean):
physical features and geology by Charles W. Andrews,
with descriptions of the fauna and flora by numerous
contributors.**

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Order 6.—HOMOPTERA.

By W. F. KIRBY, F.L.S., F.E.S., etc.

(PLATE XV.)

OF this Order eleven species are enumerated in the following list, all of which, so far as is known, are peculiar to the island. Of these, seven are now described as new, one being considered to represent a new genus, the other four having been described by me in 1888 from Mr. Lister's collection; of these the descriptions are here reprinted. It is curious that six species out of the eleven belong to a single family, the Ricaniidæ.

CICADIDÆ.

- ✓ *Pæcilopsaltria*, Stål.
calypso, Kirb.

RICANIIDÆ.

- ✓ *Ricania*, Germ.
 ✓ *flavifrontalis*, sp.n.
 ✓ *Paurostauria*, g.n.
 ✓ *delicata*, sp.n.
 ✓ *Varcia*, Stål.
 ✓ *flavicostalis*, Kirb.
 ✓ *Nogodina*, Stål.
 ✓ *affinis*, Kirb.
 ✓ *hyalina*, Kirb.
 ✓ *subviridis*, sp.n.

DELPHACIDÆ.

- *Bidis*, Walk.
 ○ *aristella*, sp.n.

APHROPHORIDÆ.

- *Clovia*, Stål.
eximia, sp.n.

ISSIDÆ.

- ✓ *Issus*, Fabr.
 ✓ *andrewsi*, sp.n.

JASSIDÆ.

- *Idiocerus*, Lewis.
 ○ *punctatus*, sp.n.

Family CICADIDÆ.

1. *Pæcilopsaltria calypso*.

○ *Oxypleura calypso*, Kirb. : P.Z.S., 1888, p. 553.

✓ *Pæcilopsaltria calypso*, Dist. : Mon. Oriental Cicadidæ, p. 6, tab. x, figs. 3a, b (1889).

“*Male*.—Black, with testaceous markings. Head black; front of vertex with a wide testaceous stripe on each side, extending from the inside of the eye to the striated portion of the face. Longitudinal sulcation broad, rather deep black, surmounted by a trapeziform ochreous spot; the transverse striations, except the upper ones, are marked with ochreous, ending in a continuous ochreous stripe, not striated, on each side of the extremity of the longitudinal sulcation. Sides of face clothed with thick yellowish-grey hair; labrum with a longitudinal testaceous stripe, expanded above and below, proboscis testaceous, black towards the extremity,

and reaching as far as the hinder trochanters; antennæ black. Pronotum testaceous, entirely so behind; a dumb-bell shaped black mark in front of this, extending to the front edge, and the central sutures blackish; sides not greatly expanded, with irregular black markings, and dotted with grey hair; mesonotum black, with two short, thick, tawny stripes on each side, not reaching the front edge, and a spear-headed, tawny mark, filled with black in the middle, directed forwards; scutellum with the hinder half and lateral ridges testaceous. Abdomen black, sutures narrowly edged with testaceous, especially on the sides; segment 7 with two testaceous dots in the middle, and a larger spot on each side. Sternum mostly black, clothed with greyish hair; legs testaceous; coxæ, four front femora, and tarsi streaked with black above; opercula testaceous, extending nearly to the end of the first segment of the abdomen. Abdomen beneath testaceous; basal segment entirely black, the following segments triangularly blackish on each side at the base, the last two lateral lobes spotted with black. Tegulæ and wings hyaline, with brown nervures; costal nervures and inner marginal nervure testaceous.

“Allied to *O. bufo* and *O. polita*, Walk., but differently marked.

“An extremely hairy pupa, marked ‘Dug up, earth, October 8,’ accompanied the specimen, besides an empty pupa-skin, both probably belonging to the same species.”

Three males, one from the west coast, October, 1897, and another from Flying Fish Cove, August, 1897. Also three pupæ, one darker than the others, found in April, 1898.

Besides these, there is a female specimen from the east coast, October, 1897. It differs little from the male, except in the paler colour of the light markings.

Family RICANIIDÆ.

2. *Ricania flavifrontalis*, sp.n. (Pl. XV, Fig. 5.)

Long. corp. 3.25 mm.; exp. al. 11–13 mm.

Head brown above; pronotum blackish on the back; abdomen blackish in the middle, otherwise rufo-testaceous; face and under-surface dull yellow, clypeus slightly broader than long, nearly square, but with the lower angles slightly rounded off; a slight vertical carina. Tegmina brown, costa with a white or yellowish-white basal stripe, sometimes extending to two-fifths of the length of the tegmen. Beyond this the costa is marked with pale spots as far as a large white band on the costa at about two-thirds of its length; this band is subinterrupted below, and then turns obliquely outwards. This lower part extends for about half the length of the upper, and is much narrower, and rather pointed at the end. Within this is a broad white band, outwardly concave on its upper portion, and extending to the inner margin.

The basal portion of the corium is much mottled with white. The lower part of the hind margin is dotted with white, and the marginal portion of the tegmen is marked off on the inside in one specimen by a row of hardly indicated white dots. Wings hyaline, with broad pale-brown borders. The fringes of both the tegmina and wings consist of very short, straight, isolated bristles, only visible under the microscope. Before the tip of the tegmina is a slightly oval black spot, rather large for the size of the insect.

Two specimens, North Coast, January, 1898.

The white markings and well-marked subapical black dots will easily distinguish this interesting little species.

✓
 ○ **PAUROSTAURIA**, Kirby, gen. nov.

Front quadrangular, broader than long, slightly expanded below, and with a central carina. Vertex transverse, about three times as broad as long, and gradually concave behind. Pronotum curved, transverse, mesonotum oval, tricarinate, rather long. Tegmina hyaline, very broad at the extremity, the costa slightly arched, much longer than the inner margin, which is a little shorter than the hind margin. Apex much rounded, and hind margin curving obliquely to the hinder angle, which is obtusely rounded; inner margin convex. Costal cell with oblique transverse nervules; subcostal cell free; basal cell oval, broader than long. Three longitudinal nervures running from the basal cell, the upper one forked close to its base, and the branches again forking at about half their length, and ultimately throwing off long forks to the hind margin. The middle nervure forks a little further from the base, and once or twice more before or near the middle of its length; the lower nervure forks only once, at about half its length. An obsolete nervure curves round inwards from the costa at three-fourths of its length to the base of the first fork of the lower branch of the middle longitudinal nervure. Before the apex of the tegmen is a large black stigma, and the marginal area, which is rather broad, is marked off by a row of pale nervules between the nervures. The clavus throws off a vein of about half the rest of its length near the base, which curves to the inner margin; between and beyond are several transverse nervules. Wings hyaline, much shorter than the tegmina, the three upper longitudinal nervures variously forked, and connected by two oblique transverse nervures. Hind tibiæ bispinose.

Allied to *Ricanoptera*, Melichar; but it does not appear to be congeneric with the species of that genus before me. *Inter alia*, the subapical spot seems to be always absent in *Ricanoptera*. The name *Paurostauria* has been suggested by the paucity of cross-nervures in this insect.

✓ 0 **3. Paurostauria delicata**, sp.n. (Pl. XV, Fig. 6.)

Long. corp. 3 mm.; exp. tegm. 10 mm.; lat. tegm. 3 mm.

Male.—Testaceous (probably green when living, as the abdomen is still green in one of the specimens); eyes and vertex brown. Tegmina hyaline, with most of the nervures yellow, except in the dark portions. Marginal area brown, broadest at the apex. An oval, subapical black spot, below which a hyaline curved stripe runs down to the inner margin; the brown band within this is bisected by the light cross-nervules marking off the marginal area. Costa with a black line, commencing at about half the length of the costal cell, and curving round the end of the subcostal cell; it also throws off an expanding pear-shaped black spot, running downwards to half the width of the tegmen, beside the marginal markings. Between these black markings, the costa, and the subapical spot, the wing is brown, with hyaline markings. The subcostal nervure is broadly black above, narrowly edged with yellow below, and the upper longitudinal nervure is marked with a large black spot in the middle. The curved dividing-line in the middle of the tegmen is edged outside with black, and a series of irregular black markings is continued to the inner margin. Nearer the base are two or three more small black spots, and the greater part of the lower vein of the clavus is broadly black.

Described from three specimens, without special locality.

✓ 0 **4. Varcia flavicostalis**. (Pl. XV, Fig. 7.)

✓ 0 *Ricania flavicostalis*, Kirb.: P.Z.S., 1888, p. 554.

Varcia flavicostalis, Melichar: Ann. Nat. Hofmuseums, xiii, p. 319 (1899).

“Exp. al. 20 mm.; long. corp. 7 mm.

“*Male*.—Head yellow, with four keels; vertex depressed, brown, except at the sides and on the median line; front quadricarinate, the angles of the outer carinæ very prominent, the middle ones hardly projecting on the frontal edge; all the carinæ black, and with a short dark line on the clypeus between them, the middle ones rather wide apart, and meeting in a point at the extremity of the clypeus. Thorax and abdomen blackish brown above, the thorax tricarinate, varied with ferruginous on the sides and along the outer edges of the two outer carinæ; abdomen with the second segment greenish, and the base of the three following segments ferruginous. Undersurface of the body and legs yellowish; the four front tibiæ brownish above; abdominal segments edged behind with a green line; the last two segments reddish brown. Wings hyaline; fore wings with the costal space yellow as far as the black stigma, beyond which is a hyaline space; hind margin broadly purplish brown, intersected by a curved line

nearly parallel to the hind margin; within the middle of this runs a narrow vitreous stripe covering the outer half of seven cells; one or two very irregular series of transverse cells beyond the middle of the wing, not even uniform on both sides; inner marginal region tinged with yellow, but less strongly than the costa; costal cross-nervures not forked, but most of the apical nervures beyond the stigma and on the hind margin are forked. Hind wings hyaline, brown along the hind margin, the first six or seven marginal nervures from the tip furcate or bifurcate.

“The neuration of this and the two following species somewhat resembles that of *R. panorpæformis*, Guér. No dates of capture are attached to any of the specimens.”

Two specimens: Flying Fish Cove, August, 1897, and East Coast, October, 1897.

✓ ○ 5. *Nogodina affinis*. (Pl. XV, Fig. 8.)

✓ ○ *Ricania affinis*, Kirb.: P.Z.S., 1888, p. 554.

Nogodina affinis, Melichar: Ann. Nat. Hofmuseums, xiii, p. 309 (1899).

“Exp. al. 22 mm.; long. corp. 9 mm.

“*Male*.—Very similar to the last species, but darker above, the brown bands on the clypeus beyond the inner carina darker; undersurface of body yellow, with irregular black markings beneath the wings, and a large spot on the pectus between the two first pairs of legs; abdomen not banded with green above, but with a row of yellow spots on the sides. Wings hyaline, not tinged with yellow on the costa or inner margin, but with a yellow spot on the costa (likewise edged with black within) before the black stigma; below the stigma are some small brown blotches along the line of the inner row of transverse cells; there are also two small brown spots nearer the base on the lower half of the wing; hind margin brown for about one-sixth of the width of the wing, and marked with two irregular hyaline spaces, each covering several cells; close to the hind margin runs an interrupted row of small hyaline dots. Hind wings hyaline, edged with brown, except towards the anal angle. Neuration nearly as in the last species, but the outer row of transverse cells less numerous.”

✓ ○ 6. *Nogodina hyalina*. (Pl. XV, Fig. 9.)

✓ ○ *Ricania hyalina*, Kirb.: P.Z.S., 1888, p. 555; Melichar, Ann. Nat. Hofmuseums, xiii, p. 337 (1899).

“Exp. al. 15 mm.; long. corp. 5 mm.

“*Male*.—Head yellowish; the carinae black, the clypeus marked with brown lines between them; the middle carinae not projecting on the vertex, which is deeply and triangularly depressed in the

middle; thorax reddish above, the middle carinae yellow; abdomen brown above, the sides marked with yellow, and the segments bordered with green behind. Undersurface of the body yellow, the femora, the extremities of the five first segments of the abdomen, and a large spot at each side at its extremity green; the base of the five first abdominal segments rich cream-colour.

“Allied to *R. pellucida* and *R. panorpæformis*, Guér.”

Twenty-eight specimens, all those specially labelled taken in January, 1898, on the North Coast. An abundant and very variable species, both in colour and neuration; but without exhibiting well-marked differences which appear to be of specific or even varietal importance. Some of the specimens are of a pale testaceous yellow, others are of a darker yellowish brown, with the abdomen more or less green, with a black dorsal band, and black sutures. The number of nervures in the costal cell before the stigma varies from 8 to 11; the stigma covers about five cross-nervures, and is generally but slightly browned, but in the darker specimens (which are usually those with most cross-nervules in the basal cell and elsewhere) it is blackish. The subcostal space is always (?) empty; but the two following longitudinal spaces are sometimes free, almost as far as the first fork of the second longitudinal nervure, which is usually preceded by a cross-nervure in each space; or there may be one, two, or three cross-nervules in each of these spaces, preceding the fork. Sometimes the marginal third of the tegmen is mapped out into three fairly regular areas; but sometimes the neuration of this portion is much more irregular. The shape, too, of the various cells differs considerably.

✓ 7. *Nogodina subviridis*, sp.n. (Pl. XV, Figs. 10, 11.)

Long. corp. 7 mm.; exp. al. 20 mm.

Female.—Testaceous; abdomen, except at tip, green, with black sutures, expanding in front, and connected; front long, with black lateral and central carinae, the latter crossing, and between their upper part is a brown line. Sutures of pronotum more or less black. Tegmina yellowish hyaline, with yellowish-brown nervures; costal area with 11 or 12 cross-nervures before the stigma, which is very large, extending between six or seven cross-nervures, those towards its base being more or less yellow. Subcostal area free. The three upper longitudinal nervures rising together from the upper angle of the basal cell; the second forking at three-fifths of its length, the third at one-fourth. The fourth is widely separated from the others at its base. It is parallel with and closely approximating to the upper vein of the clavus, and it throws off a branch upwards at two-fifths of its length. The middle vein of the clavus unites with the lower one at half its length; lower branch of the clavus broadly brown, and united

with the upper by from four to six cross-nervules. Wings hyaline, with brown nervures. (Fig. 10.)

Variety (?). *Female*.—Differs in the body being mostly black, except the front, the sides of the thorax, and the base of the abdomen, which are testaceous. The black central carinæ are merely indicated in brown, below the point where they cross; the stigma on the tegmina is almost wholly black, and there are one or two cross-nervures in the subcostal area. I can hardly consider these differences specific, having only single specimens to compare. (Fig. 11.)

The type is from the East Coast, and the variety from the North Coast, January, 1898.

Allied to *N. plena*, Wlk., and *N. affinis*, Kirb.

Family DELPHACIDÆ.

8. *Bidis aristella*, sp.n. (Pl. XV, Figs. 12, 13.)

Long. corp. 4 mm.; exp. al. 12 mm.

Testaceous, the two joints of the antennæ long, cylindrical, of equal length, and set with very short brown bristles; the second joint slightly thicker than the first, subannulated, and with two long brown bands, not extending to either extremity; it is followed by a bulb bearing a very fine bristle, longer than the two joints together. Vertex and front quadricarinate, the carinæ brown, and the centre of the front and the narrowest space between the central carinæ, on the vertex, brown. Beyond this point, the central carinæ unite with the outer ones, and run backwards parallel to the eyes, the space between which is very deeply concave behind; there is also a brown spot between the carinæ, where they diverge.

Pronotum with three black carinæ, one central, the others starting from it in front, curving round each eye. Mesonotum with five longitudinal black carinæ, the two outer ones slightly diverging, and followed by a brown line on the sides of the pronotum. Both the pronotum and mesonotum have very prominent lateral angles, before which is a brown line. Abdomen testaceous, with red central and terminal carinæ, the latter preceded by broad brown bands; the two terminal segments are blackish, bordered behind with testaceous. Ovipositor of the female blackish, up-curved; above it is a long, broad, blackish process, set with rather long bristles, and bifid at the extremity. Tegmina yellowish hyaline, the nervures and fringes set with short bristles, and alternately brown and yellow for rather long spaces. There is a large brown spot in the middle of the clavus, and in the female the space between this and the base is also brown. There is also a brown curved nervure marking the apical area, and the space between this and the apex is much clouded with brown, especially in the female; and nearer the base the dark portions of the

nervures are more or less clouded with brown. Wings hyaline, mostly with brown nervures. Legs testaceous, end of tibiæ, and the tarsi mostly brown.

Four specimens: East Coast, September, 1897, and Flying Fish Cove, 1898.

Allied to *B. pictula* and *B. punctifrons*, Wlk., but with the nervures running to the costa yellow and unspotted; in the other species they are brown, and terminate in brown spots on the costa.

Stål notes *Bidis*, Wlk., as = *Ugyops*, Guér.; but as some of the characters disagree, I retain Walker's name for the present.

○ Family APHROPHORIDÆ.

○ 9. *Clovia eximia*, sp.n. (Pl. XV, Fig. 14.)

Exp. al. 14 mm.; long. corp. 5 mm.

Head and thorax black, dull above, shining beneath, upper part of front with seven transverse testaceous bands, the uppermost widely interrupted, and those below the second more or less irregular and indented in the middle; below them is a trace of an eighth; proboscis and a triangular spot just above its base also testaceous. Vertex and thorax hardly separated, front yellow, narrowly edged with black from eye to eye, and with a short waved transverse black stripe in the middle. Behind this is another, longer, curving from eye to eye in front, and there is again a broader black band between the eyes, followed by two yellow ones. The thorax may be described as black, with three broad transverse yellow lines, and the scutellum is marked with three yellow lines, converging behind, and joined by a yellow curve in front. Sides of metathorax and extremity of the rufous-brown abdomen varied with testaceous. Tegmina rufous brown, with testaceous yellow markings, those towards the extremity tinged with golden. An oblique long oval spot at one-third of the length of the costa, a short slightly curved spot on the costa at two-thirds of its length, and three pale stripes on the lower part of the hind margin. The outer portion of these is brown, but does not touch the hind margin, and the two lower ones contain a longitudinal brown dash on the outer part. There is a bifid yellow stripe, traversing the clavus parallel with the inner margin, from the base; the outer branch is narrow; the inner one is broader, and curves up to meet a corresponding spot on the inner margin of the corium. Legs testaceous, longitudinally striped with brown, the hind legs darkest.

Eleven specimens: from East Coast, September 28, and October, 1897; and North Coast, January, 1898.

Not closely allied to any other species at present in the British Museum (Natural History); but appears to approach *C. lemniscatus*, Stål, described from Java.

Family ISSIDÆ.

10. *Issus* (?) *andrewsi*, sp.n. (Pl. XV, Fig. 15.)

Long. corp. cum tegm. 6 mm.; long. tegm. 5 mm.; lat. tegm. 2.5 mm.

Testaceous, front black, tricarinate in the middle, the lateral carinæ meeting above in an acute angle; the sides are dotted with testaceous, and the summit of the angle is of the same colour. There are also outer carinæ, raised at the summit within the eyes; vertex and lower mouth-parts testaceous. Legs testaceous, the femora and tibiæ more or less black in the middle. Tegmina coriaceous, greenish grey, a little mottled with brown or reddish brown, especially on the clavus and along the borders, wings brownish hyaline.

One specimen, without special locality. Allied to some unnamed Indian species in the collection of the Museum.

Family JASSIDÆ.

11. *Idiocerus* (?) *punctatus*, sp.n. (Pl. XV, Fig. 16.)

Long. corp. cum tegm. 5 mm.; long. tegm. 3.5 mm.

Almost uniform testaceous, darkest on the thorax, which is sculptured with transverse striæ. The front of the thorax is sometimes speckled with brown, and the hinder part and base of the scutellum are marked with four rather indistinct brownish bands. Ocelli in the middle of the front, about twice as far apart as each is distant from the margin of the eye. Tegmina with longitudinal rows of brown setiferous punctures, and with a brown spot on the inner margin towards the end of the vein of the clavus. Hind tibiæ long, whitish, strongly ciliated.

Five specimens: from East Coast, August, 1897; Flying Fish Cove, October, 1897; and North Coast, January, 1898.

Somewhat resembles *Bythoscopus testaceus*, Wlk., from Sarawak, but much smaller, paler, and with the ocelli much further from the eyes. It is still nearer *B. unicolor*, Wlk., from Makian (Celebes); but the latter species has a brown spot at the end of the tegmina, and the front is less rounded above.

Order 7.—MALLOPHAGA.

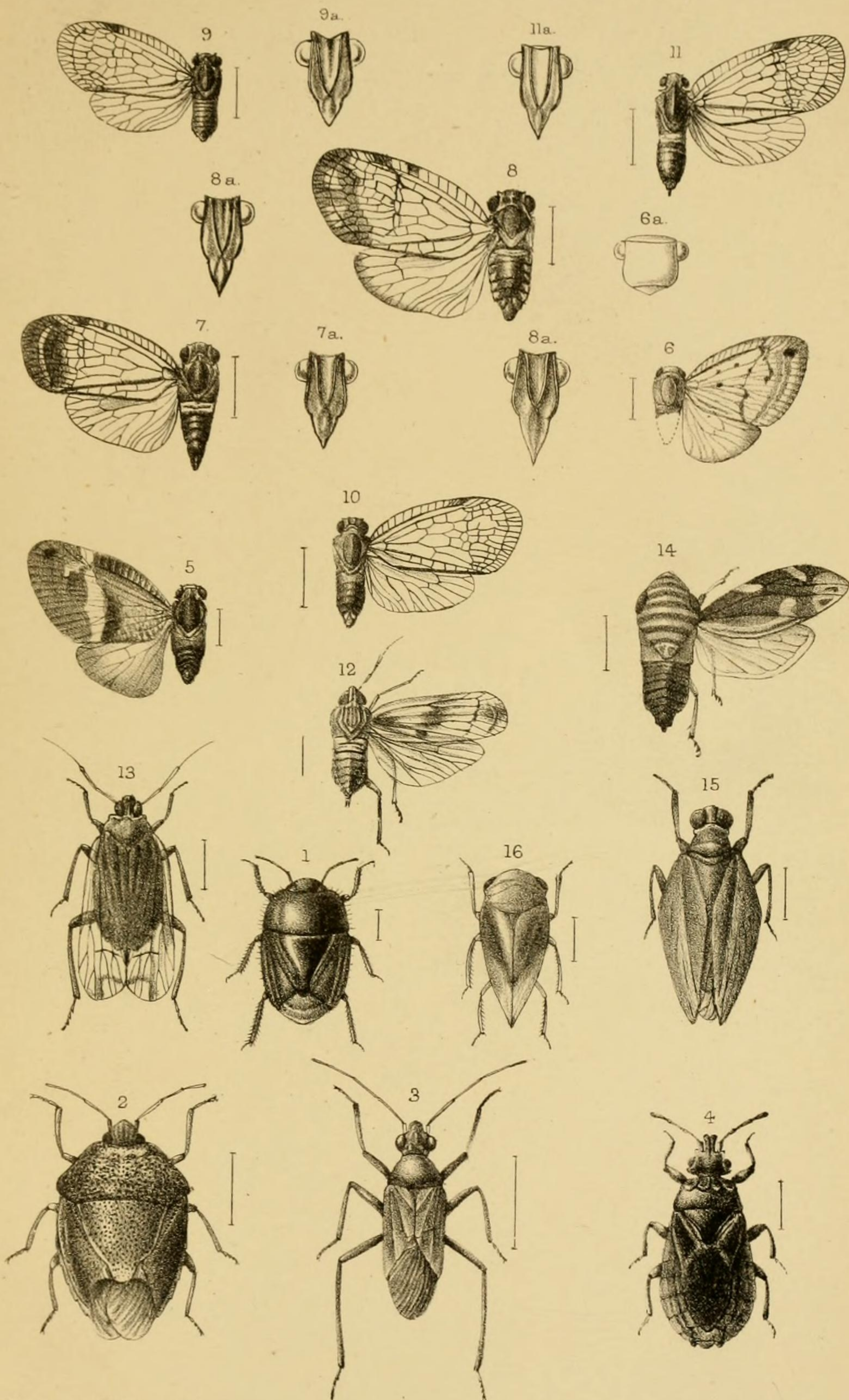
By W. F. KIRBY, F.L.S., F.E.S., etc.

A SINGLE specimen (East Coast, September, 1897), probably from some marine bird, but closely resembling, except in its much greater size, *Nirmus attenuatus*, Nitsch, as figured by Giebel (Insecta Epizoa, Tab. vi, fig. 1). The latter species is found on the corncrake.

PLATE XV.

HOMOPTERA AND HEMIPTERA.

- FIG. 1. *Æthus nitens*, Kirby, sp.n. (p. 127.)
FIG. 2. *Pentatoma grossepunctatum*, Kirby, sp.n. (p. 128.)
FIG. 3. *Lygæus subrufescens*, Kirby. (p. 128.)
FIG. 4. *Brachyrhynchus lignicolus*, Kirby, sp.n. (p. 129.)
✓ ○ FIG. 5. *Ricania flavifrontalis*, Kirby, sp.n. (p. 131.)
✓ ○ FIG. 6. *Paurostauria delicata*, Kirby, sp.n. (p. 133.)
✓ ○ FIG. 7. *Varcia flavicostalis*, Kirby, sp.n. (p. 133.)
✓ ○ FIG. 8. *Nogodina affinis* (Kirby). (p. 134.)
✓ ○ FIG. 9. *Nogodina hyalina* (Kirby). (p. 134.)
✓ ○ FIG. 10. *Nogodina subviridis*, Kirby, sp.n. (p. 135.)
✓ ○ FIG. 11. *Nogodina subviridis*, Kirby, sp.n., var. (p. 136.)
○ FIG. 12. *Bidis aristella*, Kirby, sp.n. (p. 136.)
○ FIG. 13. *Bidis aristella*, Kirby, sp.n. (p. 136.)
○ FIG. 14. *Clovia eximia*, Kirby, sp.n. (p. 137.)
✓ ○ FIG. 15. *Issus* (?) *andrewsi*, Kirby, sp.n. (p. 138.)
○ FIG. 16. *Idiocerus* (?) *punctatus*, Kirby, sp.n. (p. 138.)



M. Horman-Fisher del. et lith.

West, Newman imp.

Homoptera.
and Hemiptera.