

*The New Zealand Plant-hoppers of the Family Cixiidae (Homoptera).*

By J. G. MYERS, B.Sc., F.E.S., Biology Laboratory, Department of Agriculture.

[Read before the Wellington Philosophical Society, 25th October, 1922; received by Editor, 31st December, 1922; issued separately, 18th June, 1924.]

Plates 20-24.

IN that large division the Fulgoroidea, the most largely represented family in New Zealand, both in species and in individuals, is the Cixiidae. At the present time the Fulgoroids of New Zealand are contained in seven families, eighteen genera, and twenty-nine species. Of this total the Cixiidae claims eight genera and seventeen species, so that even with our present extremely rudimentary knowledge of the New Zealand Homoptera it is safe to say that the Cixiids are the dominant Fulgoroids of this region.

The object of this paper is to give an up-to-date revision of the family, and to describe new genera and species. Such a revision can be only provisional, as the number of new forms yet undescribed is very probably large.

I wish to express my deep gratitude to Mr. Frederick Muir, of Honolulu, who has helped me with keys to genera and with much other assistance from his wide homopterological experience. He has also compared my species with Walker's types in the British Museum, and has thus enabled this paper to be more thoroughly revisional than it could possibly have been without such a comparison. For all the photographs I am indebted to Mr. W. D. Reid, of this Laboratory, who spared no pains to produce the very best results that my dissections and mounts would allow. The three drawings of the face in the genera *Koroana*, *Cixius*, and *Huttia*, showing points for which my draughtsmanship was quite inadequate, were executed by Mr. E. H. Atkinson, who is also one among the many collectors who have sent me Homoptera from all parts of the Dominion.

The genitalia were dissected and mounted in the manner recommended by Giffard and Muir.\* The card mounts, made with the help of two cover-slips, and kept on the same pin with the insect, were found extremely convenient, and served every purpose when drawing was done with a camera lucida. When, however, the genitalia were microphotographed it was found that ordinary glass slide mounts, besides being easier to handle, gave much better results.

The Cixiidae are easily collected by beating bushes and by sweeping herbage. More specimens from out-of-the-way localities and from islands are urgently desired. They should be killed with cyanide or laurel, and stored dry, without pinning, and may be kept indefinitely, or sent through the post in pill-boxes with a little soft paper. Like all small or medium-sized Auchenorrhyncha, they should be gummed transversely on small card triangles for the collection.

The biology of the New Zealand species is almost unknown. Mr. G. V. Hudson reared *Oliarus oppositus* (Walk.) from a cottony-tailed nymph

\* WALTER M. GIFFARD, The Systematic Value of the Male Genitalia of Delphacidae (Homoptera), *Annals Ent. Soc. Am.*, 14, No. 2, June, 1921, 135-40.

found under a log. I have found nymphs of the same species, in company with those of *Koroana arthuria* n. sp., very numerous under stones, in some cases with small ants (*Monomorium* sp.) in the boulder-strewn river-bed at Arthur's Pass (2,300 ft. elevation). There is a fruitful subject of study here not only in regard to the nymphs themselves, but in their relationships with the ants. Swezey\* has written an account of the life-history of the Hawaiian *Oliarus koanoa* Kirkaldy. This species spends the nymphal instars "among the decaying leaf-bases and fibrous matter of tree-fern trunks, in cavities or tunnels lined with a white fibrous material which resembled mould, or spider's web, and which is an excretion from the terminal abdominal segments of the nymphs. The nymphs probably feed upon the fern-roots in the fibrous mass of the outside of the fern-trunks, or on juices of the decaying material." In North America, according to Osborn, *Myndus radialis* lives in similar crevices lined by the fibrous material of the abdominal tufts. Swezey also quotes Townsend to the effect that *Oecleus decens* lays its eggs in punctures in the leaves of *Yucca*, each puncture being covered by white fibrous matter.

The Cixiidae are moderately-sized plant-hoppers occurring often in considerable numbers on herbage and bushes, from the mangrove swamps, through forest and tussock, up to the subalpine scrub. The tegmina are folded in a roof-like manner, or in some cases almost approaching the horizontal position over the back. In addition to flying readily by means of the usually ample tegmina and wings, these plant-hoppers use their long and strong metathoracic legs in agile leaping. A leap, in fact, is their usual method of launching into the air. The tendency to brachyptery, so frequent in other families—as, for example, the Delphacidae—is in the Cixiidae but little marked. The peculiar genus *Aka* has the shortest tegmina among the New Zealand forms, but its wings, although fairly short, are broad and ample.

The principal characters of the family may be summed up as follows: Width of head, including eyes, distinctly less than width of pronotum. Ocelli three, median one sometimes practically obsolete, but usually quite well developed. In a few foreign forms the median eye is absent. Pronotum very short, strongly subangularly notched behind (*Edwards*). Tegmina usually large, more or less transparent. Veins strong, macrotrichia conspicuous in many cases. Apical parts of tegmen not reticulate. Subcosta and radius with common stem. In some foreign forms Sc, R, and M are all separate, and in some others all three form a common stalk. Anal area of wing not reticulate except in Meenoplinæ. First joint of hind tarsus elongate. Female of many genera bears a tuft of cottony or waxy fibrous material at the end of the abdomen, secreted by the more or less vertical plate-like area, the pygophor, between anal segment and ovipositor.

The first Cixiids from New Zealand were described by Francis Walker in 1850 and 1858. He placed in the genus *Cixius* the seven species known to him, of which two were removed by Buchanan White in 1879 to *Oliarus*, and a third was made the type of a new genus, *Aka*. Of the remaining four of Walker's species Buchanan White knew nothing, but on another new Cixiid from New Zealand he erected the genus *Semo*.

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\* O. H. SWEZEY, Observations on the Life-history of *Oliarus koanoa* Kirkaldy, *Proc. Hawaiian Ent. Soc.*, 1, pt. 3, pp. 83-84, 1907.

After numerous attempts by Mr. Muir and myself to accommodate all the New Zealand species in these and other known genera, it was decided that, rather than stretch unduly the limits of genera already inconveniently crowded, it would be best to erect four new genera by means of which the relationships of our new forms might be better expressed. To differentiate these new genera Mr. Muir drew up the following key, which for a considerable time I have tested on large series of specimens. The genera have been further differentiated, and the suggested classification shown to be natural, by dissection of the male genitalia of all species in which males were procurable.

All measurements are from apex of vertex to anus, and from base to apex of one tegmen.

#### KEY TO GENERA OF NEW ZEALAND CIXIIDAE.

1. (12.) One or more spines on the hind tibiae, not counting apical spines.
2. (7.) Five mesonotal carinae, the intermediate two sometimes faint.
3. (6.) Face with a median longitudinal carina.
4. (5.) Carinae at apex of vertex and base of face distinct. Two transverse carinae on vertex, one dividing face from vertex and one basad of this, the latter straight and transverse, curved, or forming an angle and touching the anterior transverse carina *Oliarus*.
5. (4.) Carina at apex of vertex and base of face obscure or missing: median frontal carina forked about middle of face .. .. *Malpha*.
6. (3.) Face without a median longitudinal carina .. .. *Huttia*.
7. (2.) Three mesonotal carinae, the middle one sometimes obscure.
8. (9.) No median longitudinal carina on face; fronto-clypeal suture arcuate; clypeus swollen or rounded .. .. *Semo*.
9. (8.) A distinct longitudinal median carina on face.
10. (11.) A median longitudinal carina on vertex; clypeus fairly flat with a distinct median carina .. .. *Cixius*.
11. (10.) No median longitudinal carina on vertex; clypeus fairly rounded without median longitudinal carina.  $Cu_1$  joining  $M_{3+4}$  for a short distance .. .. *Koroana*.
12. (1.) No spines on hind tibiae, except apical ones.
13. (14.) Vertex with a longitudinal carina forked at apex, median carina on face forked or thickened on basal half .. .. *Aka*.
14. (13.) Longitudinal carina on vertex very short, not forked; median frontal carina not forked .. .. *Tiriteana*.

#### Genus 1. CIXIUS Latreille.

Type: *C. nervosus* (Linn.)

This almost cosmopolitan genus is sufficiently characterized in the above key. The male genitalia of the New Zealand forms are comparatively simple. The aedeagus is straight, with backwardly-directed hooks.

*Cixius punctimargo* Walker. (Plate 20, figs. 1-4.)

Walker, List Homopt. Insects in *Brit. Mus. Suppl.*, p. 81, 1858.  
 Buchanan White, *Ent. Mo. Mag.*, vol. 15, p. 216, 1879. Hutton,  
*Trans. N.Z. Inst.*, vol. 30, p. 186, 1898; *Index Faunae Nov.*  
*Zeal.*, p. 224, 1904. Kirkaldy, *Trans. N.Z. Inst.*, vol. 41, p. 28,  
 1909.

♂. Length, 3 mm.; tegmen, 4 mm. Very pale olive, the veins and tegmina malachite-green. Eyes brownish. Below brown; clypeus darker; fronto-clypeal suture black. Tegmina hyaline. Veins green, black and thickened at tips. Apical cross-veins black and thick. Stigma hyaline or whitish. Medio-ventral projection of pygophor short and sharp. Anal segment large. Anal style jet-black. Genital styles with stem rather

suddenly bent, apex triangular. Aedeagus straight with two backwardly-directed hooks and a membranous appendage.

♀. Length, 4 mm.; tegmen, 5 mm. Pale brown, eyes dark. Carinae and angles whitish. Tegmina hyaline with whitish veins; tips of veins and apical cross-veins black. Two blackish smudges at nearly half-way, just cephalad of claval suture. Ovipositor stout.

Redescribed from thirteen males and nineteen females. Tarawera (R. J. Tillyard), Herne Bay (W. G. Howes), Auckland (I. H. Myers), Rangitoto Island (I. H. and J. G. Myers)—all in Auckland Province.

Mr. Muir compared my specimens with the type in the British Museum. He writes, "This agrees with the type, which is a male; there is another male and three females in the type series."

*Cixius interior* Walker. (Plate 20, figs. 5, 6.)

Walker, List Homopt. Insects in *Brit. Mus. Suppl.*, p. 82, 1858. Buchanan White, *Ent. Mo. Mag.*, vol. 15, p. 216, 1879. Hutton, *Trans. N.Z. Inst.*, vol. 30, p. 185, 1898; *Index Faunae Nov. Zeal.*, p. 224, 1904. Kirkaldy, *Trans. N.Z. Inst.*, vol. 41, p. 28, 1909.

*Cixius aspilus* Walker, List Homopt. Insects in *Brit. Mus. Suppl.*, p. 83, 1858. Buchanan White, *Ent. Mo. Mag.*, vol. 15, p. 216, 1879. Hutton, *Trans. N.Z. Inst.*, vol. 30, p. 186, 1898; *Index Faunae Nov. Zeal.*, p. 225, 1904. Kirkaldy, *Trans. N.Z. Inst.*, vol. 41, p. 28, 1909.

♂. Length, 4 mm.; tegmen, 5 mm. Pale-greenish; veins, carinae, and angles greener. Eyes dark brown. Tegmina hyaline, veins slightly darker and thicker towards tips. Stigma hyaline or whitish. At least two apical cross-veins blackish. A blackish streak on wing-margin at apex of clavus. Frons green, clypeus yellowish-brown. Medio-ventral projection of pygophor prominent. Genital styles somewhat as in preceding species, but not bent so abruptly. Aedeagus more complex, long and straight, with three backward hooks and a membranous appendage all grouped near distal end.

♀. Length, 4 mm.; tegmen, 5 mm. Resembles male generally. Ovipositor very dark and stout.

Redescribed from eight males and six females. Rangitoto Island and Waitakerei Hills, Auckland (I. H. and J. G. Myers). Specimens have since been seen from Wanganui (J. G. M.) and Taumarunui (T. R. Harris).

It is with some doubt that Walker's name is given to this species. Mr. Muir, after examining the types, writes: "The type of *C. interior* is a female and the type of *aspilus* is a male, and they appear to be the same species. They are unicolorous, reddish-yellow, with clear tegmina bearing black macrochetæ. This colour may have been originally green and have turned yellowish-red. If so, they appear to be your No. 249."

It is interesting to note in this connection that several of my specimens, none of which are more than sixteen months old, are already turning yellowish. Walker's character, "transverse veinlets forming two lines, the interior one incomplete," is seen in the photograph (Plate 20, fig. 5). Walker gives the colour as "testaceous" or "pale testaceous." This beautiful green species is one of our finest Cixiids. As its colour would lead one to expect, it is more essentially a dweller among the green foliage of shrubs and small trees than are the other species. In habitus, and to a less extent in the appearance of the male genitalia, it affords a transition from *Cixius* to *Koroana*.

*Cixius rufifrons* Walker.

Walker, List Homopt. Insects in *Brit. Mus. Suppl.*, p. 83, 1858.

Buchanan White, *Ent. Mo. Mag.*, vol. 15, p. 216, 1879. Hutton, *Trans. N.Z. Inst.*, vol. 30, p. 186, 1898; *Index Faunae Nov. Zeal.*, p. 225, 1904. Kirkaldy, *Trans. N.Z. Inst.*, vol. 41, p. 28, 1909.

“Tawny. Head testaceous; vertex narrow, concave; front and face with a distinct keel, their borders slightly elevated; face and disc of the front red. Prothorax very short, much arched. Mesothorax with three keels. Abdomen somewhat luteous. Wings vitreous; veins testaceous, with black points towards the tips; stigma pale testaceous; with a blackish dot. Length of the body, 2 lines; of the wings, 6 lines. (a.) New Zealand. Presented by Colonel Bolton.”—(Walker.)

This species is totally unknown to me. From the description I should have expected it to be synonymous with *C. aspilus* (*C. interior*), but Mr. Muir writes as follows: “*C. rufifrons* Walker type is a male very close to *aspilus*, but the genital styles are broader and the anal segment light (in *aspilus* and *interior* it is fuscous).”

*Cixius kermadecensis* n. sp.

♀. Length, 4.4 mm.; tegmen, 5.5 mm. Pale-brownish, darker on eyes and angles of pronotum and abdomen. Ventral surface pale. Abdomen darker, with whitish edges to segments. Ovipositor strongly curved; extending slightly beyond tip of abdomen. Frons and clypeus unicolorous, pale drab, edges of face raised. Tegmina hyaline, veins pale brown, macrotrichia darker and very conspicuous. A broad brown transverse smudge at one-third of tegmen, and a smaller one at apex of clavus. Stigma with brownish centre edged with white. Hind-border of vertex less roundly notched than in most other Cixiids, also line bounding vertex cephalad, more angulate.

Described from one female. Sunday Island, Kermadec Islands, 1908 (W. L. Wallace, No. 4); on kawakawa (*Macropiper excelsum*).

Holotype in Dominion Museum, Wellington. I am indebted to the Dominion Museum authorities for the opportunity of describing this insular species.

## Genus 2. KOROANA nov.

Type: *K. helena* n. sp.

Longitudinal carina of vertex extremely obscure or entirely obsolete. Clypeus fairly rounded, without median longitudinal carina (Plate 21, fig. 6). Male genitalia complex; three very twisted hooks at base of membranous distal part of aedeagus. Tegmina long and narrow, subparallel-sided. Sc and R joined until half the length of the tegmen; their bases joined to M near base of tegmen. Forking of C about two-thirds along clavus. Claval veins joining margin considerably before apex of clavus, forking about middle. Cu usually touching M for some distance.

In other respects resembles *Cixius*. The venation exhibits considerable variation, as shown by the illustrations (Plate 21, figs. 1–5; Plate 22, figs. 1–3). Of the two species, one is apparently confined to the North Island and the other to the South.

*Koroana helena* n. sp. (Plate 21, figs. 1–8.)

♂. Length, 4 mm.; tegmen, 5 mm. Reddish, relieved with black. Vertex brownish, eyes dark. Pronotum pale-yellowish. Mesonotum henna-colour, the lateral carinae black, the median greenish. Apex of scutellum

greenish, metanotum black. Basal two or three abdominal segments black; remainder pale-reddish. Frons yellowish, with an area on each side of median ridge and whole of clypeus reddish—distinctly delimited. Tibiae usually with black proximal and distal bands. Tegmina hyaline. Veins brownish, darker at tips, with distinct black macrotrichia. An interrupted, more or less double and very variable brownish fascia obliquely transverse at a little past a third (sometimes practically obsolete). Stigma fuscous, margined with whitish. Genitalia fuscous. Medio-ventral projection of pygophor prominent. Genital styles with the blade bent sharply at right angles to stalk. Apex of peculiar shape, as shown in Plate 21, figs. 7, 8. Aedeagus with three hooks at base of membranous portion, two of the hooks twisted together in a characteristic manner (Plate 21, figs. 7, 8).

♀. Length, 4.8 mm; tegmen, 5.4 mm. Less brightly coloured than male. Disc of mesonotum between lateral carinae entirely greenish. Distal half of abdomen with indications of a median black longitudinal mark. Ovipositor pale-brownish, long and slender.

Described from fifty-three males and thirty-nine females. Apparently throughout North Island.

Holotype and allotype: Myers collection, Department of Agriculture.

This is essentially a bush-, shrub-, and tree-frequenting species.

*Koroana arthuria* n. sp. (Plate 22, figs. 1-4.)

♂. Length, 4 mm.; tegmen, 4.6 mm. Close to the preceding species, but distinguished by the stouter and more depressed form, shorter tegmina, and darker colour and more abundant pruinosity on both sexes, and also by the following characters: Tegmen with a semicircular fuscous patch on fore-border between one-third and half-way. This is always present, even in the paler forms, and furnishes a means of distinction at first glance. Hooks of aedeagus less twisted, and other genital differences as shown in Plate 22, fig. 4.

♀. Length, 4.5 mm.; tegmen, 4.9 mm. Colour paler than that of male. Ventral surface of abdomen black.

Described from twenty-two males and fifteen females. Trio Islands, Cook Strait (R. J. Tillyard); Mount Arthur (A. Philpott); Arthur's Pass (R. J. Tillyard, J. W. Campbell, W. G. Howes, I. H. and J. G. Myers) Waitati, Otago (C. E. Clarke); Queenstown (W. G. Howes).

These are all South Island localities. The Trio Islands form is consistently smaller and lighter in colour than the type (Arthur's Pass), but I can find no structural differences.

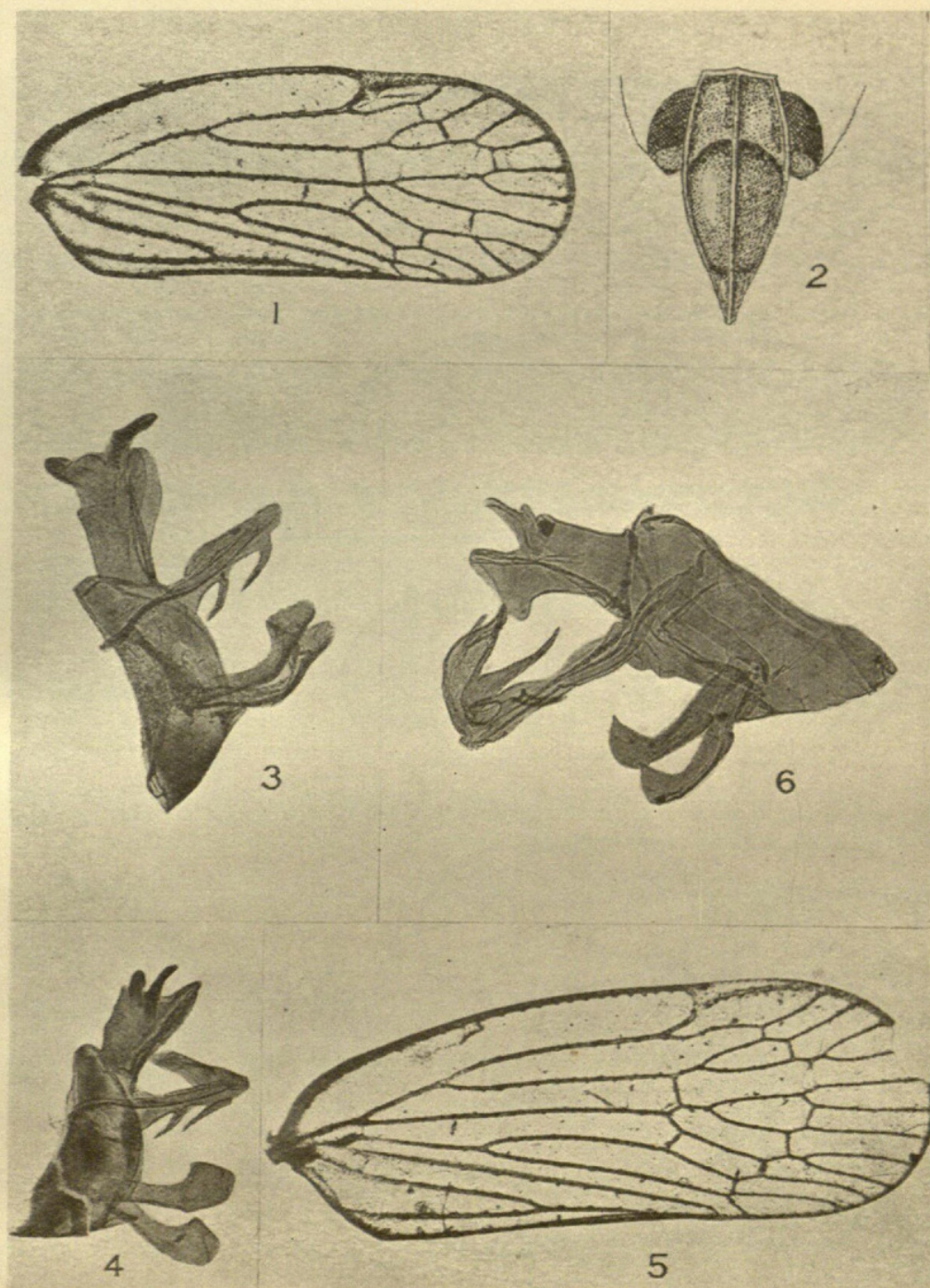
Holotype and allotype: Myers collection, Department of Agriculture.

This species was reared in large numbers from nymphs beneath stones at Arthur's Pass. Small ants were also present, but myrmecophily was not definitely established.

Genus 3. *SEMO* Buchanan White.

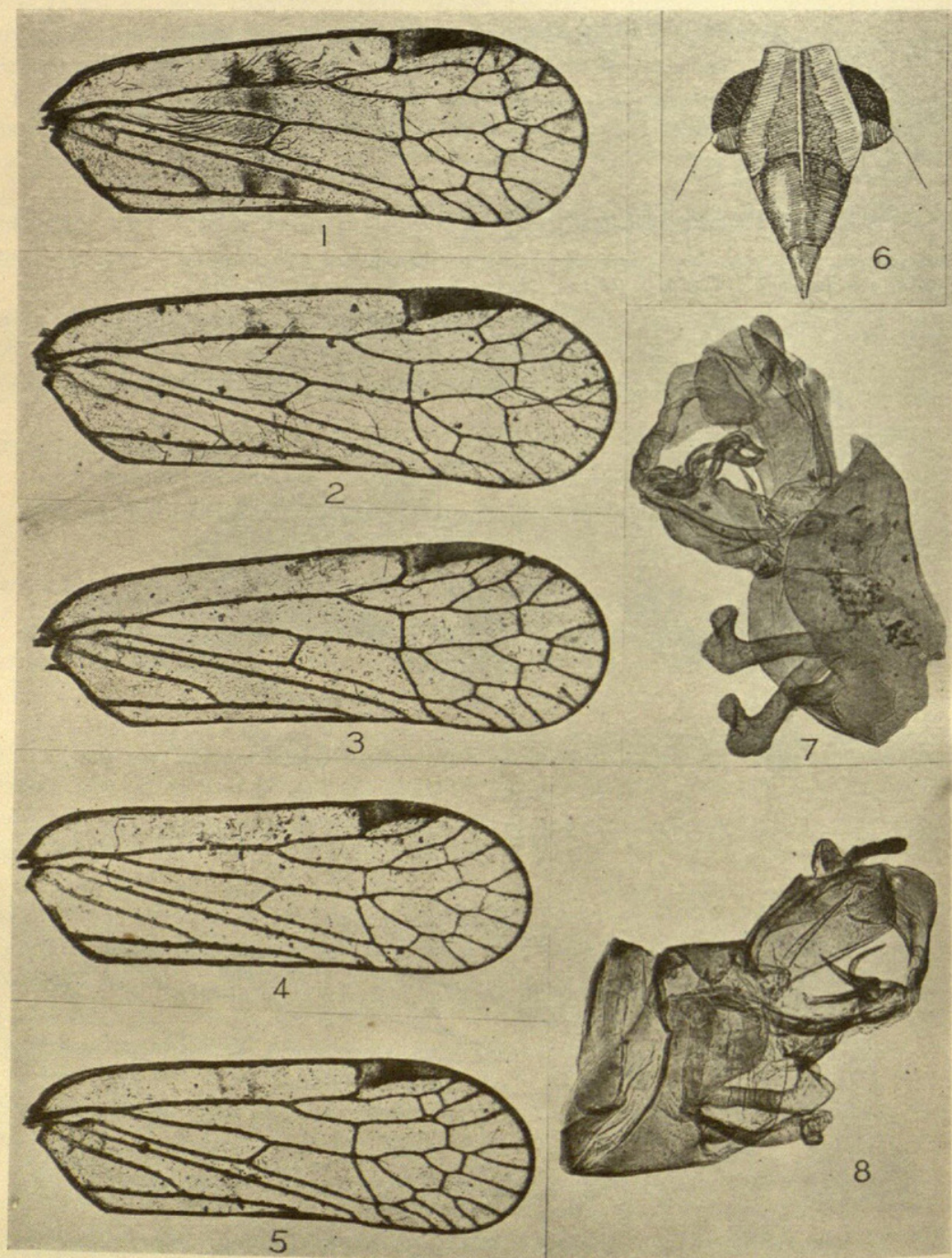
Type: *S. clypeatus* Buchanan White.

Buchanan White's description is good, except that the head, including eyes, is not as wide as pronotum. There is, therefore, no need to redescribe the genus, especially as its salient distinguishing features are incorporated in the generic key. The male genitalia approach those of the New Zealand species of *Cixius*, but are very much less armed.



[W. D. Reid, photo, and E. H. Atkinson, sketch.]

- FIG. 1.—*Cixius punctimargo* Walker : right tegmen.  
 FIG. 2.—*Cixius punctimargo* Walker : face.  
 FIG. 3.—*Cixius punctimargo* Walker : male genitalia, lateral view.  
 FIG. 4.—*Cixius punctimargo* Walker : male genitalia, semi-lateral view.  
 FIG. 5.—*Cixius interior* Walker : right tegmen.  
 FIG. 6.—*Cixius interior* Walker : male genitalia, lateral view.

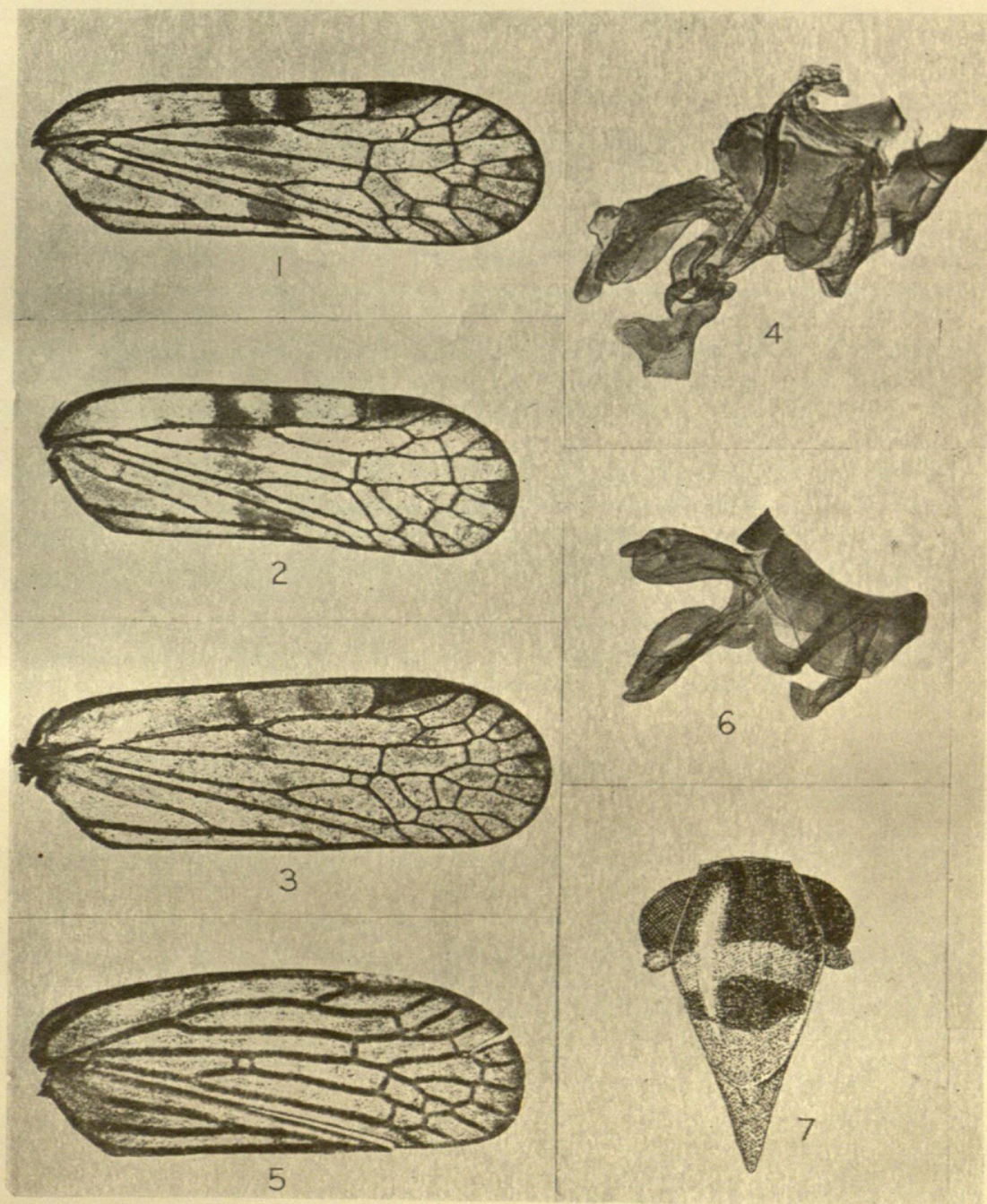


[W. D. Reid, photo, and E. H. Atkinson, sketch.]

FIGS. 1-5.—*Koroana helena* n. sp.: right tegmen of specimens from various localities, showing venational variation.

FIG. 6.—*Koroana helena*: face.

FIGS. 7, 8.—*Koroana helena*: male genitalia, views from different aspects of two different specimens.



[W. D. Reid, photo, and E. H. Atkinson, sketch.]

FIGS. 1, 2.—*Koroana arthuria* n. sp.: right tegmen of two specimens of typical form from Arthur's Pass.

FIG. 3.—*Koroana arthuria*: right tegmen of form from Trio Island.

FIG. 4.—*Koroana arthuria*: male genitalia, lateral view; typical form from Arthur's Pass (the Trio Islands form does not differ in genitalia).

FIG. 5.—*Semo clypeatus* Buchanan White: right tegmen.

FIG. 6.—*Semo clypeatus* Buchanan White: male genitalia, lateral view.

FIG. 7.—*Huttia nigrifrons* n. gen. et sp.: face (flagella of antennae broken).

**Semo clypeatus** Buchanan White. (Plate 22, figs. 5, 6.)

Buchanan White, *Ent. Mo. Mag.*, vol. 15, p. 217, 1879; Hutton, *Trans. N.Z. Inst.*, vol. 30, p. 187, 1898; *Index Faunae Nov. Zeal.*, p. 225, 1904. Kirkaldy,\* *Trans. N.Z. Inst.*, vol. 41, p. 29, 1909.

♂. Length, 3.5 mm.; tegmen, 4 mm. "Pale ochreous-brown. Head (except the keels of the vertex, side of the frons and antennae), scutellum (except the side margins), apex of tarsi and abdomen (except genitalia) more or less piceous or piceous-black" (*Buchanan White*). To this may be added the following description of genitalia: Pale-brownish. Medio-ventral projection of pygophor prominent but wide and rounded. Genital styles with very short stalks and long blades with broad roundish base and narrower apex. Aedeagus straight and almost unarmed.

♀. Length, 4 mm.; tegmen, 4.5 mm. Colour slightly paler. Ovipositor brownish, stout, but sharply pointed. Normally a heavy mass of waxy material between anal segment and ovipositor.

Twenty-five males and thirty-five females. Mount Egmont (Miss J. Anson); Tararua Ranges, 3,300–3,600 ft. (J. G. Myers); Mount Arthur (T. Cockcroft); Arthur's Pass, 2,600–2,800 ft. (I. H. and J. G. Myers); Wakatipu, 3,600 ft. (G. V. Hudson). Hutton gives the range as "Otago."

This short squat species is apparently confined to the subalpine scrub and to the undergrowth of the forest at its upper limit, in which places it often occurs in vast numbers. The South Island specimens have tegmina slightly more variegated—some of the veins being more conspicuously picked out in whitish than in the North Island specimens—but this difference is not constant.

Genus 4. **HUTTIA** nov.

Type: *H. nigrifrons* n. sp.

Body short and squat. Tegmina long and hyaline. Vertex with a median longitudinal ridge. Face with no median longitudinal carina. Pronotum very narrow, flattish, with a median longitudinal keel and two lateral ones, none very prominent. Mesonotum rounded, with five keels. Hind tibiae spined. Tegmina long, narrow and parallel-sided. Sc and R joined for rather less than one-third; their bases joined to M for about one-eighth of clavus. Cu forked about middle of clavus; claval veins joining margin near apex, forked about middle. A cross-vein from first claval to Cu<sub>2</sub> at about one-fifth along clavus.

**Huttia nigrifrons** n. sp. (Plate 22, fig. 7.)

♀. Length, 5 mm.; tegmen, 6.5 mm. Olivaceous marked with blackish. Disc of vertex and of pronotum blackish. Inner two keels of mesonotum curved so that their ends almost touch median keel; all three very distinct, the keels olivaceous and intervening spaces blackish. Tegmina glassy-clear, including the veins, except where the latter, at intervals, are marked with black. A few fuscous marks along the inner border of clavus. Abdomen rounded. Anal segment and ovipositor almost same length, both black and slender. Legs long. Frons almost entirely shining-black; a wide transverse band of white at fronto-clypeal suture, followed by a transverse nearly semicircular band of shining-black; rest of clypeus pale-brownish.

\* I do not understand why Kirkaldy placed this, together with *Aka* and the *Achilid Agandecca*, in his Poekillopteridae.

One female. Pakuratahi, Upper Hutt, Wellington (T. Cockcroft). I am deeply indebted to Mr. T. Cockcroft for his sole specimen of this interesting species.

Holotype, female: Myers collection, Department of Agriculture.

*Huttia harrisi* n. sp.

♀. Length, 5 mm.; tegmen, 5.5 mm. Olivaceous, pronotum green. Inner two keels of mesonotum only faintly indicated. Keels paler in colour than disc. Tegmina hyaline, veins fuscous; stigma whitish. Four fuscous marks on fore-border of tegmen; apical cells tipped with fuscous; a blackish smudge just beyond apex of clavus. Ovipositor brownish, shorter in proportion to its width than in previous species. Frons greenish, passing into yellowish on the clypeus, which is faintly obliquely ridged.

One female. West coast, South Island (T. R. Harris). I have much pleasure in dedicating this fine species to the discoverer.

Holotype: Myers collection, Department of Agriculture.

The localities from which the two species of *Huttia* have come, one in North Island and one in South, are both heavily forested.

Genus 5. MALPHA nov.

Type: *M. muiri* n. sp.

Body short and stout and somewhat depressed. Tegmina short and oblong. Division of Sc and R before half-way from base to stigma, their bases joined to M only up to less than a quarter of clavus. Forking of Cu a little more than half-way from base of clavus. Claval veins joining margin well before apex; forking beyond middle. Carina at apex of vertex and base of face obscure or missing; median frontal carina forked about middle of face (in this character approaches *Aka*). Vertex slightly wider than long; widest at base, which is emarginate in a broadly wedge-shaped manner; lateral carinae well developed, continuing unbroken on to the face. Clypeus with median carina fairly distinct; lateral carinae (raised edges) less so. Antennae fairly long; first segment very short; second longer than wide. Prothorax short; hind-margin excavated by a right angle; a median longitudinal carina. Mesonotum with five carinae; distinctly flattened between carinae; hind-margin forming an equilateral triangle. Female with ovipositor short. Hind tibiae spined.

*Malpha muiri* n. sp. (Plate 23, figs. 1, 2.)

♂. Length, 4 mm.; tegmen, 4.3 mm. Olivaceous marked with chocolate-brown. Lateral margin of pronotum, sides of mesonotum, part of metanotum, and base of abdomen rich chocolate-brown. Frons widest at two-thirds from base, where the sides are strongly raised, basal portion pale-greenish, followed by a wide band of shining-piceous, next a band of yellowish, along the middle of which the fronto-clypeal suture shows as a fine reddish hair-line; apical half of clypeus shining-piceous. Fore and middle tibiae with a proximal and a distal ring of brownish; rest of legs pale. Tegmina clouded with yellowish-white; veins fuscous at intervals except on apical half where they are continuously dark. Stigma yellowish, three or four indistinct marks along costa, and another at distal end of claval vein. Wings milky, veins black. Genital styles small, apical portion of blade narrowed into a small, finger-like process. Aedeagus complex.

♀. Length, 4 mm.; tegmen, 4.3 mm. Colours and markings more obscure. Ovipositor very short and stout but projecting beyond anal segment; between them a small wax-secreting area.

One male and one female. Mount Alpha, 3,600 ft., Tararua Range; on undergrowth of shrubby *Senecio* and *Olearia* in *Nothofagus* forest (J. G. Myers).

Holotype and allotype: Myers collection, Department of Agriculture.

I dedicate this, the genotype of an endemic genus, to Mr. F. Muir.

*Malpha iris* n. sp.

♀. Length, 4 mm.; tegmen, 4.6 mm. In dorsal view, second joint of antennae projecting well beyond eyes. Pale-brownish; the tegmina folded almost horizontally; glassy-clear with veins fuscous, in parts white. Stigma whitish; apically somewhat thickened and blackish. A black spot at the lateral corners of mesonotum. Basal portion of frons whitish; borders shining yellowish-brown; apical part shining-piceous except to within a short distance of clypeus. Median ocellus black (at least there is a black dot in this position. I am not sure whether it is a functional ocellus). Clypeus long and narrow, whitish. *There is a distinctly marked line of colour from the base of the tegmen on one side to that on the other, passing across face just cephalad of the fronto-clypeal suture: all cephalad of this line, except the basal part of the frons, is shining-black; all caudad of the line is dull-white—a most striking demarcation.* Ovipositor short and stout.

One female. York Bay, Wellington; mixed *Nothofagus* and rain forest (I. H. Myers). I dedicate this species to the discoverer, my wife.

Holotype, female: Myers collection, Department of Agriculture.

*Malpha duniana* n. sp. (Plate 23, fig. 3.)

♂. Length, 4 mm.; tegmen, 4.1 mm. Olivaceous marked with fuscous. Abdomen blackish. Frons olivaceous spotted with fuscous; fronto-clypeal suture strongly depressed, marked with greenish-white. Mesonotum with the two inner keels somewhat obscure. *Bases of wings and of tegmina milky-white marked with black.* Tegmina hyaline with a fuscous area near the base covering more than half of clavus; a brownish splash including the distal portion of stigma and extending obliquely on to the disc; another at apex of hind (inner) margin of tegmen. Veins blackish and white alternately; extreme tips blackish and thickened. Three or four blackish marks along costa. Wings short and broad. Genital styles large and spatulate. Aedeagus complex, resembling that of *M. muiri*. Fore and middle legs with a proximal and a distal band of brownish.

♀. Length, 5 mm.; tegmen, 5.1 mm. The two inner keels of mesonotum almost obsolete. Abdomen dark. Ovipositor somewhat larger than that of *M. muiri* and *M. iris*.

One male and two females. Dun Mountain, Nelson, 3,000 ft. (R. J. Tillyard and A. Philpott).

Holotype: Myers collection, Department of Agriculture. Allotype: Cawthron Institute.

In the structure of the face and in the shape of the genital styles this species approaches *Aka* more than do the other species of the genus.

*Malpha cockcrofti* n. sp.

♀. Length, 4.5 mm.; tegmen, 5 mm. Uniform reddish-ochraceous, deepening on the face, under-parts, and mesonotum to a shining-tawny.



1924. "The New Zealand plant-hoppers of the Family Cixiidae (Homoptera)."  
*Transactions and proceedings of the New Zealand Institute* 55, 315–326.

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