

# On the Psyllidae of New Zealand (Homoptera)<sup>1</sup>

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## INTRODUCTION

THE PSYLLID FAUNA of New Zealand has heretofore been only poorly known. It has been, therefore, a highly prized opportunity to spend a year in New Zealand collecting and studying this family of insects. It is obvious that one cannot hope to exhaust or even cover adequately the insect resources of an area of the size and diversity of New Zealand in one season, but enough was accomplished during that time to indicate the direction for further work and to give some idea of the relationships of the psyllid fauna of New Zealand to that of other areas.

Only two papers of significance on the Psyllidae of New Zealand have been published previously. These are Maskell's paper (1890) and that of Ferris and Klyver (1932). Maskell brought together his knowledge of the group in New Zealand and rectified some of the errors made in his earlier brief communications (Maskell, 1879, 1880). Portions of Maskell's material, which I have been able to study, consist of a few dried nymphs and one or two fragmentary adults in the collection at Cawthron Institute and three slides and a vial of dried nymphs in the Canterbury Museum. The paper of Ferris and Klyver was based on a collection of 450 specimens accumulated by Dr. J. G. Myers. They summarized all the earlier work and gave an adequate treatment of the 25 species which they had at hand. I have been able to collect and

identify with reasonable certainty all but four of their species. Of the four, I have some question as to the identity of two; a third, probably a synonym, was not obtained; and the fourth, *Gyropsylla zealandica* (Ferris and Klyver), I was unable to locate. Two unexplained omissions from the paper of Ferris and Klyver are the lack of any indication of date for any of the material and the absence of any statement of size except for one species. As many of the New Zealand species appear to be very definitely seasonal, the collection data are quite important.

The bulk of the Myers collection, including all the types, was returned by Ferris and Klyver to Dr. Myers, who was killed in an accident shortly thereafter. As I have been unable to locate his collection, several uncertainties must remain until such time as its disposition can be ascertained and the specimens studied further, if they still exist. Thanks to the excellence of the illustrations, which are of the high standard usually produced by Ferris, few really serious obstacles were encountered.

In addition to the species recognized by Ferris and Klyver, I have obtained those of Maskell which they did not have, and I am adding 23 new species and 2 new genera to make a total of 51 species and 6 genera known from New Zealand. In this paper I have not repeated the descriptions or figures of those species which have been adequately described or figured previously.

All of the holotype and allotype specimens of the new species are deposited in the Cawthron Institute at Nelson. I feel very strongly that type material should be left in the country of origin if there is an institution within

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the country which can assure proper care of such material. It is in accord with this view that these types are left in New Zealand. Unfortunately this has been seldom done in the past. Therefore, present and future taxonomists in New Zealand face a tremendous difficulty.

#### ACKNOWLEDGMENTS

The number of those who have helped in one way or another in forwarding this work is very large, and space will not permit the complete listing of them here. My deepest appreciation is due Dr. E. A. Dennis and Mr. E. G. Budge of the U.S. Educational Foundation in New Zealand, who, from the time of the granting of the award until the completion of the work, have assisted in many ways. The administrative officers of Victoria University College and Massey Agricultural College, collectively and individually, have been most helpful. To Dr. J. H. Tetley of the Department of Zoology, Massey Agricultural College, who not only assisted me in collecting, but whose anticipation of my needs in equipment and materials and whose assistance in many ways have contributed greatly to my efforts, I am most deeply grateful. Of those many persons who have assisted in the field work, I must mention with gratitude Dr. W. Cottier of the Plant Diseases Division, D.S.I.R.; Mr. G. B. Rawlings, Forest Experiment Station, Whakarewarewa; Mr. L. J. Dumbleton, Mr. E. S. Gourlay, and Mr. A. W. Parrott, Cawthron Institute; Dr. R. A. Cumber, Phormium Research Station; Mr. R. R. Foster, Canterbury Museum; and Dr. T. E. Woodward, Auckland University College, all of whom contributed much valuable information as well as specimens. Dr. John Salmon of Victoria University College was most helpful prior to his departure for England. To Mr. John Carnahan and Dr. J. S. Yeates of the Department of Botany, Massey Agricultural College; Miss P. A. Lush, Dominion Museum; and Miss J. M. Dingley, Plant Diseases Division,

D.S.I.R., I express sincere appreciation for assistance in identification of plants.

#### PROCEDURE

As the only material available for study in any of the collections in New Zealand has consisted of a few vials of specimens, mostly nymphs, and a few fragments of Maskell's material, it was necessary to collect the specimens for study. This is, of course, the ideal method, and it proved very pleasurable as well as fruitful. In making the collections, a heavy sweeping net and aspirator were used for capturing the adults and for general "prospecting." Once a population was located, an attempt was made to secure nymphs and to rear some of them to the adult state, thus making absolutely certain the identity of the host plant. In almost all cases, specimens of the host plant were taken and submitted to the botanists mentioned for identification.

Some specimens of each collection have been mounted on card points. All the specimens mentioned were collected by myself during the season 1950-51, except where otherwise stated.

For each species figured, specimens have been dissected, mounted in glycerin jelly, and examined under the dissecting and compound microscopes.

The terminology used is that in general use by workers on the Psyllidae with a few possible exceptions which are largely self-explanatory. I have used the term "points" to indicate the minute sclerotizations on the membrane of the wings as this is more accurate than the term punctations, which was used by Ferris and Klyver.

The names of localities in New Zealand have been taken from the maps of the New Zealand Automobile Association.

#### DISCUSSION

As is well known, the New Zealand flora shows many differences to the north or south of a line which falls approximately at the 38th parallel. Unfortunately, the time spent



collecting in the northern section was rather too early in the season, and, on two of the three expeditions which I made into this area, the weather turned very bad; thus the representation from this area is rather poor. I am confident, therefore, that the number of species yet to be discovered in this area is quite large, especially as many of the plants which are restricted to this area are members of families or genera which are common hosts to psyllids elsewhere. The representation from the area south of this line is probably much better proportionately. Enough material was obtained there to indicate a large probable population on several groups of plants which are abundant in species and of which only a small percentage was examined. *Olearia* and *Senecio* are of particular interest in this regard. It appears that there are at least two distinct, parallel, evolutionary lines of psyllids on these plants and that they show a high degree of speciation and host specificity. One of these lines is represented by *Trioza subacuta*, *T. doryphora*, and *T. subvexa*, the other by *T. crinita* and *T. scobina*. As there are more than 80 species of plants belonging to these and related genera of Compositae in New Zealand, and as the majority of the 8 or 10 species which were examined yielded more than one species of psyllid, it seems probable that the psyllid fauna associated with this group is very large. It is certainly one of the most interesting from an evolutionary standpoint.

In the collecting, several remarkable examples of localization of infestations were encountered. The most extreme instance was that of *Trioza hebicola*, which was found on *Hebe salicifolia* at only one spot, although the host plant, which is very common throughout New Zealand, was examined throughout the season both before and after finding this one infestation.

Another instance of localized distribution is that of *Anomalopsylla insignita* n.g., n.sp., which was taken on *Shawia paniculata* at one spot near Nelson and obtained nowhere else.

As this is one of the most common hedge plants in the country, it seems probable that this psyllid is permanently limited, ecologically, to such seaside areas as are little noticed. Just what the factors are which produce such localization is impossible to say until much more careful collecting has been done; theorizing at present would be futile although tempting.

No parasitized specimens of native species were noticed, but parasitized nymphs of some of the *Acacia*-inhabiting *Psylla* were seen. Predators of three groups were quite active throughout the country, the larvae of Coccinellidae, Hemerobiidae, and Syrphidae being common on infested plants. However, only one specimen of adult syrphid was obtained by rearing. The nomadic nature of my summer season largely precluded successful rearing of these voracious predators.

The relationship of the fauna of New Zealand to those of other parts of the world is of great interest, largely because of the relative present-day isolation of the islands. A few definite statements can be made now as regards the psyllid fauna. First, as has been mentioned previously by Heslop-Harrison (1949b), Ferris and Klyver were in error in stating that "There is no reason to suppose that any of them [the species they list from New Zealand] are introduced forms. . . ." Actually there is no doubt whatsoever that four of the five species which they assigned to *Psyllia* [*Psylla*] and one of their species of *Ctenarytaina* are introduced from Australia. These species of *Psylla* have recently been placed in a separate genus by Heslop-Harrison, together with several Australian species and one from India. In my opinion, although these species form a natural group, it is one which properly constitutes a subgenus. The remaining species assigned to *Psylla* by Ferris and Klyver (*P. apicalis*) and a new related species are of more doubtful affinities but are left in *Psylla* for the time being.

The genus *Ctenarytaina*, however, shows a

definite link with Australia and also occurs in the Lau and Society Islands.

The new genus *Anomalopsylla* is most closely related to *Tainarys* of any known forms. On the basis of the peculiar wing venation alone, it could be assigned to the subfamily Ciriacreminae. However, as it differs widely from any known forms placed in that subfamily, and as I believe the presence of a cross vein or veins to have arisen separately a number of times in the family, it is placed tentatively in *Spondyliaspinae*. Both this genus and *Tainarys* seem to show some affinity to the distinctive Australian fauna. However, until the fauna of South America is much better known than it is at present, the degree of relationship between these genera and the Australian representatives of this subfamily is doubtful. Although I have seen no specimens of *Rhinocola aceris*, it would appear to be quite similar to *Tainarys* and *Anomalopsylla* in many ways, especially in the head structure and the lack of meracanthi.

The species *Atmetocranium myersi* seems to be a migrant from the tropical Pacific area.

If the species placed in *Metaphalara* [*Gyropsylla*] by Ferris and Klyver was properly assigned, this represents another link with the Americas, as the other known species of this genus are all American.

The dominant group present is the genus *Trioxa*, which, being ubiquitous, furnishes little evidence for conclusions as to relationships with other faunas.

At present, then, it can be said that the demonstrated distributional relationships seem to be threefold, one group showing definite kinship to Australia, one to South America (one to both of these areas), and one to the tropical Pacific region. The first two would seem to argue for the often-postulated Antarctic connection of the lands south of 30°. Granting such a connection in the past, the area of origin and direction of migrations are still completely unanswered. There is, however, nothing to suggest New Zealand

as the origin of any of the groups which are found there.

#### SYSTEMATIC TREATMENT OF NEW ZEALAND SPECIES

The species of Psyllidae now known from New Zealand represent four subfamilies, the Psyllinae, Triozinae, Pauropsyllinae, and Spondyliaspinae.

Keys to the species of the various genera are not included as it has been found impossible to prepare satisfactory keys without using genitalial characters predominantly, and I feel that such keys would have but little value.

#### KEY TO GENERA FOUND IN NEW ZEALAND

1. Basal vein of forewing branched trichotomously ..... *Trioxa*  
Basal vein of forewing branched dichotomously ..... 2
2. Vertex without coronal suture; proximal segment of metatarsi without claws ..... *Atmetocranium*  
Vertex with coronal suture; proximal segment of metatarsi with one or two claws ..... 3
3. Genae more or less strongly produced as lobate processes ..... 4  
Genae not at all produced ..... 5
4. Mesotibiae with a longitudinal comb of short setae near apex .... *Ctenarytaina*  
Mesotibiae without subapical comb of setae ..... *Psylla*
5. Metacoxae without meracanthus; forewing with extra branch on cubitus, cross vein between Rs and M<sub>1</sub> .....  
..... *Anomalopsylla*  
Metacoxae with meracanthus; forewing with cubitus two-branched, without cross veins ..... *Gyropsylla*

#### PSYLLINAE

This, the typical subfamily, is represented in New Zealand by two genera, *Psylla* and *Ctenarytaina*.

The species here placed in *Psylla* fall into



two distinct groups. The first group of nine species (*P. acaciae* and related forms) are undoubtedly introduced from Australia, with one exception, and appear to be limited to their introduced host plants. The exception is *P. dodonaeae*, found abundantly on *Dodonaea viscosa*, a plant which has a very wide distribution in the tropical and warm temperate parts of the world. No psyllids have been recorded from it elsewhere, hence the status of this New Zealand species remains doubtful. It appears to be a natural migrant here, however, as there is no reason to believe that it was introduced by man. These species belong to the group which Heslop-Harrison recently treated as a distinct genus, *Acizzia*. In my opinion, although they constitute a natural group of species, they are not sufficiently distinct to warrant generic status and are more properly considered as a subgenus. The distinctive type of male proctiger of most of those known is the principal difference from the structure of typical *Psylla*, but this is not present in all the Australian forms. The tendency for the genal processes to cover the frons only incompletely is also not universal in the obviously related Australian species, nor is it limited to these Australian species, as several North American species exhibit the same trait. The prothoracic pleura vary in shape, and in some of the species, notably *acaciae-baileyanae*, they are of the form found in *Arytaina*. It is apparent that this character alone is insufficient for generic separation in the species here being considered, as they are obviously closely related forms. This seems to call for a reassessment of this and other characters used for generic separation in the entire subfamily. Fortunately, Heslop-Harrison has undertaken this difficult task.

The second group consists of endemic species, *P. apicalis* Ferris and Klyver and *P. carmichaeliae* n. sp. They are certainly not closely related to the introduced Australian species. *P. apicalis* appears to show relationship to *Euphalerus nidifex*, an American species. *P. carmichaeliae* is reminiscent of

some of the North American species referred to *Arytaina*. For the present it seems best to place them in *Psylla* and avoid undue multiplication of genera or subgenera until the South American fauna is well known, when I believe their proper position can be ascertained.

The peculiar genus *Ctenarytaina* is known at present to contain three species from New Zealand, two from Australia, one from the Lau Islands, and one from the Society Islands. The attachment of the type species to *Fuchsia* makes the question of its occurrence in South America an interesting possibility. Although the female genital segment of some of the species resembles that of some Australian genera placed in the Spondyliaspinae, the genus is left in the Psyllinae for the present, principally on the basis of the presence of the meracanthi.

#### Genus *PSYLLA* Geoffroy

The use of *Psyllia* by Ferris and Klyver in accord with the opinion of E. P. Van Duzee is incorrect under the International Rules of Nomenclature; hence their species are here returned to *Psylla*. Five new species are added to the four previously known to occur in New Zealand.

#### *Psylla* (*Acizzia*) *acaciae* Maskell

1894 *Psylla acaciae* Maskell, Ent. Monthly Mag. 30: 171.

1932 *Psyllia acaciae* Ferris and Klyver, New Zeal. Inst., Trans. 63: 50, pls. 12, 13, 16.

This species has been adequately described and figured by Maskell and by Ferris and Klyver. It was taken from its host plant, *Acacia melanoxylon* R. Br., at Nelson, September 19, and at the Forest Research Station, Whakarewarewa, December 4 and March 25.

#### *Psylla* (*Acizzia*) *conspicua* n. sp.

Fig. 1

Length to tip of folded wings 2.75–3.25 mm.

**COLOR:** Body yellow to orange, abdomen green in female, dark brown dorsally and white ventrally in male. Forewings whitish, beautifully marked with brown (Fig. 1*a*).

**STRUCTURE:** Body surface finely punctate, nearly glabrous dorsally, venter sparsely pubescent. Head deflexed, wider than meso-scutum. Vertex short with shallow discal impressions, lateral ocelli on raised areas at posterior corners, anteriorly smoothly continuous with genae. Genae not touching but narrowly separated, produced as short blunt lobes, with prominent pubescence. Antennal sockets incomplete next eyes, antennae 1.6 times as long as width of head. Thorax broad, well arched. Pronotum long, rounding down anteriorly. Forewings about 2.5 times as long as wide, membrane somewhat thickened,

thickly set with minute points; pterostigma long, narrow, Rs nearly straight, marginal cells large, cubital larger than medial. Hind wings large, 0.9 as long as forewings. Metatibia with basal spur, 1 outer and 4 inner apical spines. Proximal segment of metatarsi with 2 large, black claws.

Male proctiger short with large caudal lobe as figured. Forceps as long as proctiger in lateral view, curved caudad, tapering to blunt tip, small anterior lobe near base; in caudal view stout, straight to black incurved tips. Aedeagus a simple hook. Female genital segment large, shorter than rest of abdomen; dorsal valve long, nearly straight to blunt tip; ventral shorter than dorsal, sharp tipped.

**HOLOTYPE**, male, allotype, female, numerous paratypes, Houhora, October 3 and 4.

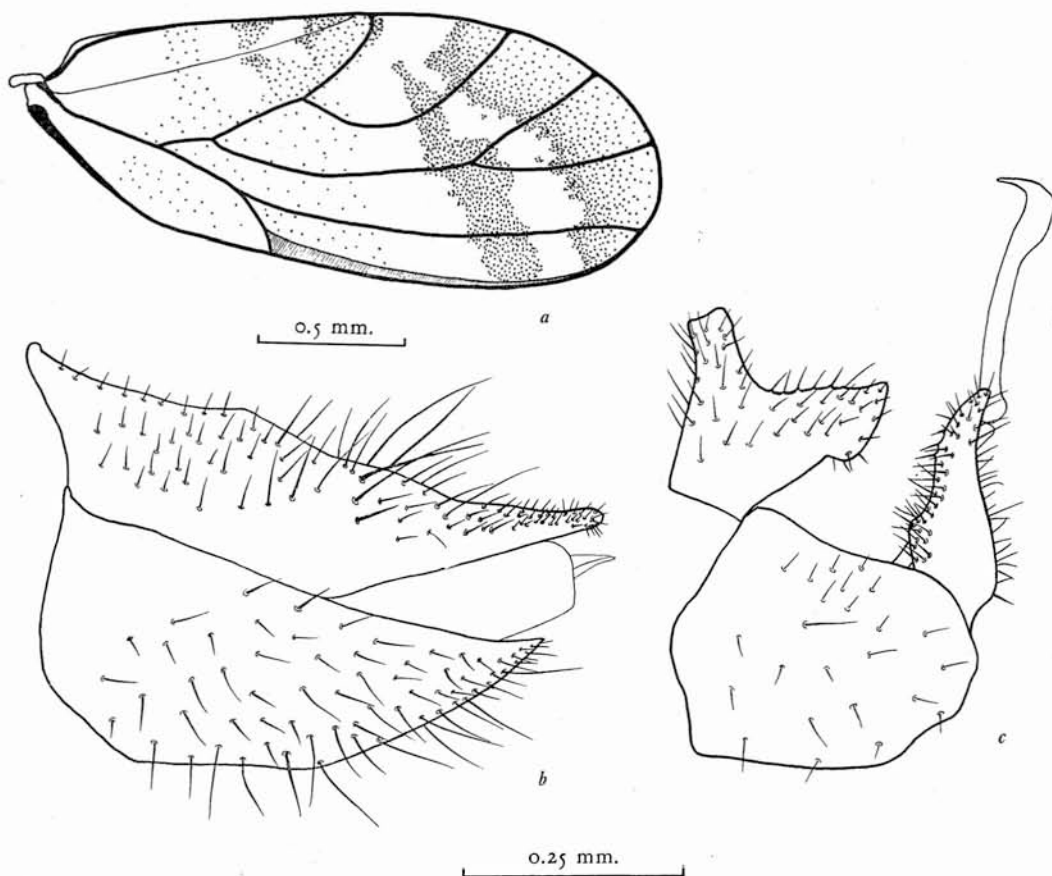


FIG. 1. *Psylla conspicua* n. sp. *a*, Forewing; *b*, lateral aspect of female cauda; *c*, lateral aspect of male cauda.



Several additional paratypes, Houhora, February 16, R. A. Cumber.

HOST PLANT: *Acacia melanoxylon* R. Br.

This strikingly marked species, which appears to be nearest *P. acaciae* of any of the species found in New Zealand, was teeming on the twigs of the host plant, in all stages of development, early in October.

***Psylla (Acizzia) uncatoides* (Ferris and Klyver)**

1932 *Psyllia uncatoides* Ferris and Klyver, New Zeal. Inst., Trans. 63: 49, 53, pl. 13.

Length to tip of folded wings 2.0–2.5 mm.

This appears to have the widest range of hosts of any of the species of *Psylla* known in New Zealand. It was taken in abundance on *Albizzia lophantha* at Otiria and New Plymouth, October 2 and 30, on an unknown species of *Acacia* at Whakarewarewa, December 4, and *Acacia verniciflua* at Palmerston North, February 15. It was originally described from specimens collected from *A. melanoxylon*.

The specimens on *Acacia* sp. from Whakarewarewa and, even more, those on *A. verniciflua* have the membrane of the forewings yellow. The marking of the forewings is variable in intensity as is the degree of marking on the dorsum.

***Psylla (Acizzia) albizziae* (Ferris and Klyver)**

1932 *Psyllia albizziae* Ferris and Klyver, New Zeal. Inst., Trans. 63: 49, 51, pls. 12, 13.

Specimens identical with the original descriptions and figures were taken in great abundance and in all stages of development on *Acacia decurrens* wherever this widespread species was examined. Adults only were taken from *Clianthus puniceus*. No specimens were taken from *Albizzia lophantha*, only *P. uncatoides* being found on that plant.

HOST PLANTS: *Albizzia lophantha* Hook. [?], *Acacia decurrens* Willd., and possibly *Clianthus puniceus* Bks. & S.

***Psylla (Acizzia) jucunda* n. sp.**

Fig. 2

Length to tip of folded wings 2.25–2.5 mm.

COLOR: General color variable from almost uniformly bluish green to yellow with olive-green markings and genae white. Forewings clear except for pigmented areas. Latter much as in *P. acaciae*.

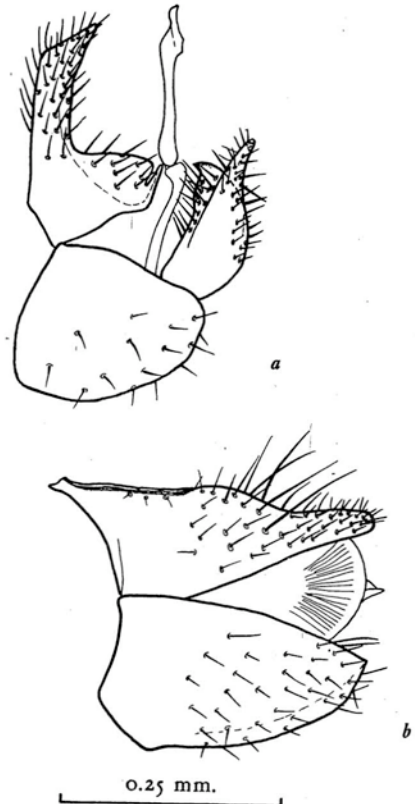


FIG. 2. *Psylla jucunda* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

STRUCTURE: Body surface finely punctate, very short sparse pubescence on dorsum, longer on venter. Head wider than mesoscutum. Vertex flat, with slight discal impressions. Genal processes somewhat depressed from plane of vertex, blunt, short, 0.4 as long as vertex (0.5 as long as medial suture), not touching. Frons visible between genal processes. Antennae twice as long as width of head. Eyes protruding. Thorax broad. Pronotum long, descending anteriorly.

only. Propleura not equal. Forewings broadly rounded, 2.4 times as long as wide, membrane thickly set with minute points; pterostigma long and narrow, Rs nearly straight, marginal cells very large, nearly equal. Hind wings large, nearly reaching apex of forewings. Metatibiae with small basal spur, 5 apical spines, 1 on outer margin, 4 on inner margin. Proximal segment of metatarsi with 1 black claw on outer margin.

Male proctiger elongate, oblique apically, strongly produced caudad basally, caudal lobe with apical hook as figured. Forceps shorter than proctiger; in lateral view broad basally, almost evenly narrowed to blunt, black, incurved apex; large lobe arising on mesal surface, projecting anteriorly, sharp, black at tip; in caudal view stout, nearly straight to sharp black tips, black-margined mesal lobes touching, black tipped, sharp. Female genital segment shorter than rest of abdomen; dorsal valve slender apically, blunt; ventral valve very deep, blunt.

HOLOTYPE, male, allotype, female, numerous paratypes collected on *Acacia decurrens* in the Waitakere Hills near Auckland, September 29, additional paratypes from the same host at various localities and dates.

HOST PLANT: *Acacia decurrens* Willd.

This is the second most abundant of the three species of *Psylla* which were taken on this species of *Acacia*. It is a handsome, graceful little species with very distinctive male genitalia. Of the New Zealand forms, it seems to be nearest *P. uncatoides*.

*Psylla (Acizzia) exquisita* n. sp.

Fig. 3

Length to tip of folded wings 1.50–1.75 mm.

COLOR: Body white to yellow with some fuscous especially on legs and abdomen. Forewings white with three irregular, transverse black bands.

STRUCTURE: Body surface finely punctate, dorsum glabrous. Head wider than mesoscutum, scarcely deflexed. Vertex short,

rounded down anteriorly, deeply excavate next eyes, lateral ocelli on large protuberances. Genae scarcely produced, not touching, large frons visible. Antennae far laterad, sockets almost touching eyes, 1.8 times as long as width of head. Eyes of moderate size, recessive, appearing somewhat stalked from shape of vertex. Pronotum long, sharply depressed anteriorly. Forewings broadly rounded, 2.5 times as long as wide; pterostigma large, Rs slightly sinuate, marginal cells large, equal, membrane somewhat thickened, very thickly set with minute points. Hind wings nearly equaling forewings, set with minute points.

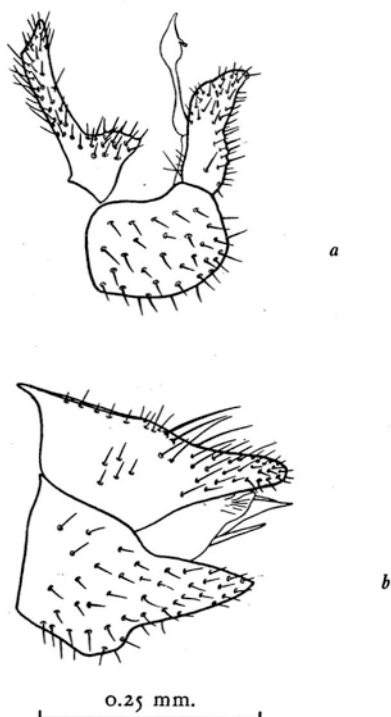


FIG. 3. *Psylla exquisita* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

Metatibiae with small basal spur, 1 outer and 4 inner, black, apical spines. Proximal segment of metatarsi with 1 black claw, outer.

Male proctiger long, slender, with basal caudal lobe. Forceps shorter than proctiger, somewhat sinuate, blunt, curved caudad apically, with small mesally projecting lobe on mesal surface (see Fig. 3a). Female genital



segment short; dorsal valve straight, blunt; ventral valve with prominent hump, sharp.

HOLOTYPE, male, allotype, female, and several paratypes, Massey Agricultural College, October 27 and November 10, taken from *Acacia decurrens*. Additional paratypes from same host, Waitakere, September 29.

HOST PLANT: *Acacia decurrens* Willd.

This small, beautifully marked species is by far the least common of the three found on this species of wattle. It is very active and quite delicate, which makes the capture of intact specimens difficult.

*Psylla* (*Acizzia*) *acaciae-baileyanae*  
Froggatt

1901 *Psylla acaciae-baileyanae* Froggatt, Linn. Soc. N. S. Wales, Proc. 1901: 257, pls. 14, 16.

1924 *Arytaina acacia-baileyanae* Petzey, Union S. Africa, Dept. Agr., Ent. Mem. 2: 21, pl. 1.

1932 *Psyllia uncata* Ferris and Klyver, New Zeal. Inst., Trans. 63: 49, 53, pls. 12, 13.

Length to tip of folded wings 1.1–1.6 mm.

This minute species is abundant on *Acacia baileyana* and probably occurs wherever it grows in New Zealand. I have examined Froggatt's types and find them to be identical with *uncata* of Ferris and Klyver. It is unquestionably closely related to the other Australian species which inhabit the wattles in such abundance and is, therefore, necessarily kept in the genus *Psylla* even though the propleura are as in *Arytaina*.

In addition to those found on the ordinary host, I found it breeding in abundance on *Acacia podalyriaefolia* at Massey Agricultural College.

HOST PLANTS: *Acacia baileyana* F. v. M. and *A. podalyriaefolia* Cunn.

*Psylla* (*Acizzia*) *bakeae* n. sp.

Fig. 4

Length to tip of folded wings 2.0–2.25 mm.

COLOR: General color light reddish brown; genal processes, base of antennae, legs, and margins of some sclerites lighter; abdomen

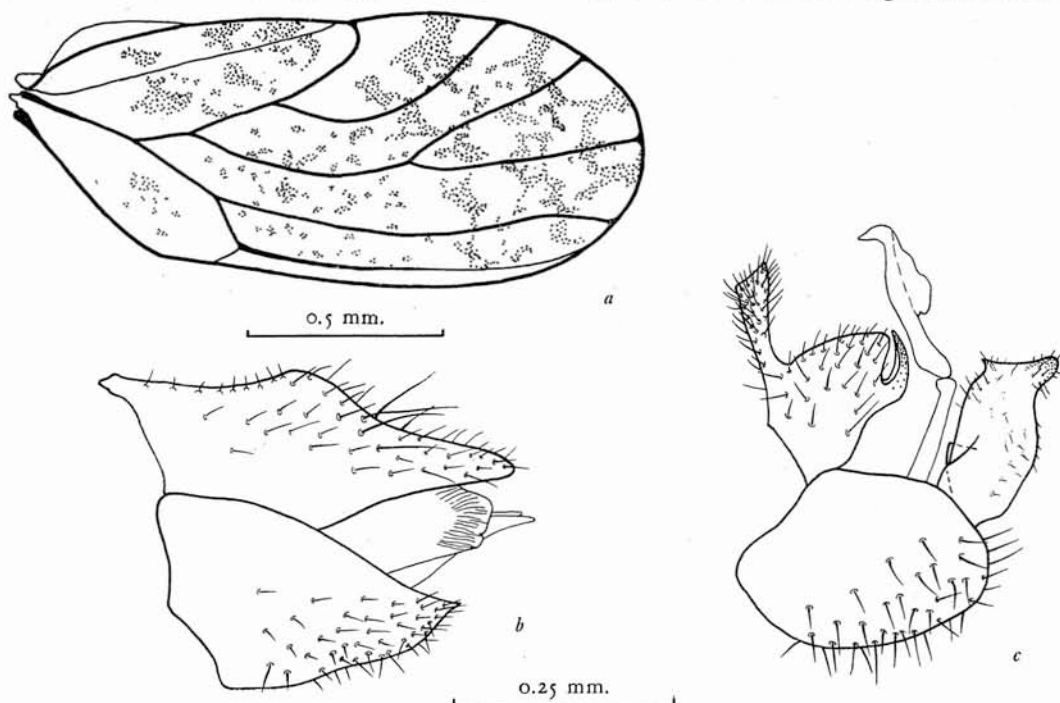


FIG. 4. *Psylla bakeae* n. sp. a, Forewing; b, lateral aspect of female cauda; c, lateral aspect of male cauda.

and venter of thorax more or less brown. Wing membranes white, forewings with dark brown maculations as figured.

**STRUCTURE:** Body surface punctate. Head and pronotum deflexed from plane of body. Head much wider than mesoscutum. Vertex strongly narrowed anteriorly, produced each side of median ocellus, emarginate next to eyes, with distinct discal impressions, lateral ocelli strongly raised at posterior corners. Genae produced as short, blunt, contiguous or slightly separated processes, covering frons, antennal sockets touching eyes. Antennae variable from less than 1.5 times as long as width of head to 1.6 as long. Eyes scarcely recessive, appearing somewhat stalked because of constriction around base. Pronotum large. Forewings broadly rounded, slightly over twice as long as wide, membrane thickly set with minute points; pterostigma long and narrow, marginal cells large, about equal. Hind wings with closely set minute points. Metatibiae with very small basal callus, 1 outer and 3 or 4 inner apical spines. Proximal segment of metatarsi with 1 outer black claw.

Male proctiger strongly produced caudad in basal half, terminating in large, heavily sclerotized hook, apical half slender, cylindrical, apex oblique. Forceps about as long as proctiger; in lateral view broad, margins sinuate, apex broadly emarginate, large anteromesal lobe, anterior corner of apex small, sharp, posterior produced as blunt lobe; in caudal view nearly straight to blunt black tips. Female genital segment shorter than rest of abdomen; dorsal valve elongate, blunt; ventral valve shorter, sharp.

**HOLOTYPE**, male, allotype, female, numerous paratypes from *Hakea acicularis*, Houhora, October 3. One additional paratype, Warkworth, October 1, and many from the same host near Tauranga, November 2.

**HOST PLANT:** *Hakea acicularis* R. Br.

Apparently introduced from Australia with the host plant, this small species was abundant on it at Houhora and Tauranga on the

dates given. Keith L. Taylor of the Division of Entomology, in Canberra, Australia, has taken a closely related species from *Hakea dactyloides* in New South Wales.

*Psylla (Acizzia) dodonaeae* n. sp.

Fig. 5

Length to tip of folded wings 2.25–2.75 mm.

**COLOR:** General color of body white to pale buff, dorsum with orange and brown markings forming broken lines. Abdomen green. Forewings transparent, membrane slightly yellowish with light brown markings resembling the pattern of *P. acaciae* but much less distinct.

**STRUCTURE:** Body surface rough, shining. Dorsum with minute pubescence. Head and pronotum deflexed. Head wider than mesoscutum. Vertex plane with large discal impressions, narrowed anteriorly, produced above median ocellus, not as long as eyes laterally, lateral ocelli raised, at posterior corners. Genae produced as short cones, not quite touching basally, somewhat divergent, antennal sockets touching eyes. Antennae twice as long as width of head. Eyes not recessive, distinctly separated from vertex. Postocular sclerites well developed. Thorax moderately arched. Pronotum long, angular, and abruptly margined anteriorly. Forewings rounded apically, long, 2.75 times as long as wide, membrane thickly set with prominent points except along veins, fine alar radular areas; venation much as in *P. acaciae*, marginal cells larger. Hind wings long, 0.8 as long as forewings. Metatibiae with small basal spur, 1 outer and 3 inner apical spines. Proximal segment of metatarsi with 1 outer black claw.

Proctiger of male produced caudad basally, terminating in large, lightly sclerotized hook, apical half slender, cylindrical, curved caudad. Forceps shorter than proctiger; in lateral view broad basally, suddenly narrowed, then curved caudad to blunt black tips; in caudal view nearly straight to apical third, then



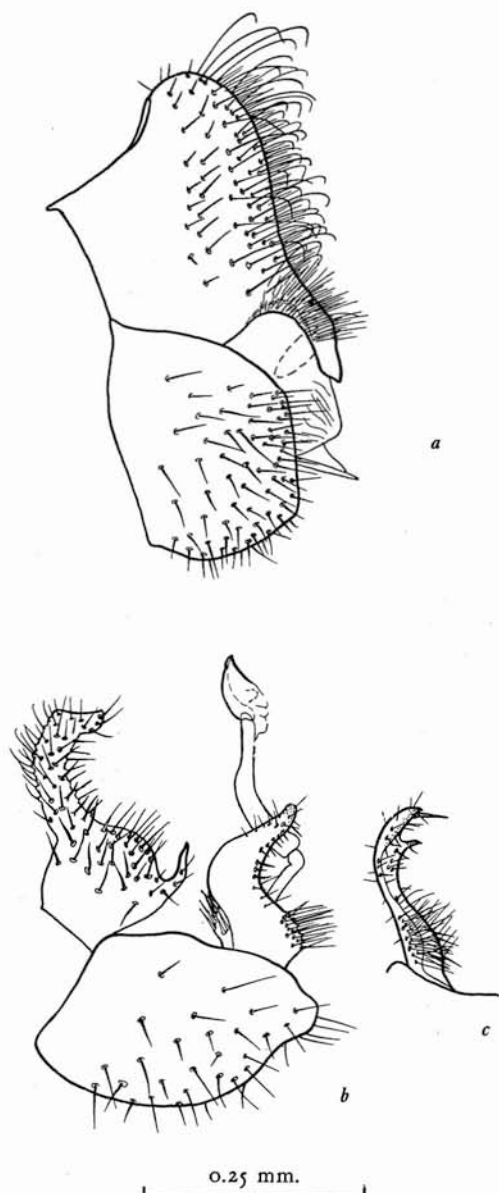


FIG. 5. *Psylla dodonaeae* n. sp. a, Lateral aspect of female cauda; b, lateral aspect of male cauda; c, caudal aspect of male clasper.

curved mesad to blunt tips, large, sharp, black-tipped tooth below apex. Aedeagus very heavily sclerotized, especially joint, structure as figured. Female genital segment very peculiar, large but much shorter than rest of abdomen; dorsal valve very strongly arched, swollen, caudal margin almost perpendicular

to short, beak-like, heavily sclerotized tip, caudolateral margin with row of very long incurved setae; ventral valve very short, broadly truncate, with prominent inner "sleeve."

HOLOTYPE, male, allotype, female, taken from *Dodonaea viscosa* in the Forest Research Station grounds at Whakarewarewa, December 4. Numerous paratypes with same data and from same host near Nelson, September 19, January 16, and March 7.

HOST PLANT: *Dodonaea viscosa* Jacq.

Although taken only at two localities, this species certainly occurs throughout the New Zealand range of its host. As the host plant is very widespread outside New Zealand, its possible range elsewhere is very interesting.

The very peculiar female genital segment is unlike any other known to me except that of *Tetragonocephala flava* Crawford, a North American species.

#### *Psylla apicalis* (Ferris and Klyver)

1932 *Psyllia apicalis* Ferris and Klyver, New Zeal. Inst., Trans. 63: 49, 52, pls. 12, 13.

This handsome little species (2.0–2.25 mm.) was taken from Cape Rainga to Manapouri on its host, the kowhai, *Sophora tetraptera*. I cannot understand the statement of Ferris and Klyver that the head form is practically as in *Psylla acaciae* as it differs markedly, especially in the genal processes which are larger, contiguous basally for some distance, and are scarcely deflexed from the plane of the vertex. Also there are four large, evenly spaced black spines at the apex of the metatibiae in *apicalis* rather than the arrangement of 3 and 1 as in *acaciae*. Otherwise their description is quite adequate.

This species resembles *Euphalerus nidifex* Schwartz in appearance and, to some degree, in structure. It should, perhaps, be referred to that genus but is being left in *Psylla* for the time being in the hope that further collecting in Central and South America will give a more adequate concept of *Euphalerus* and thus allow a proper disposition of this and related New Zealand forms. The species which have

been referred to *Euphalerus*, from the Oriental and Pacific areas, depart rather widely from the type species.

*Psylla carmichaeliae* n. sp.

Figs. 6, 7

Length to tip of folded wings 2.5–3.0 mm.

COLOR: General color tan (greenish in some specimens) with irregular fuscous markings, more or less of linear pattern on dorsum. Abdomen brown. Forewings white with dark brown spots as figured.

STRUCTURE: Body surface punctate, shining. Head as wide as mesoscutum. Head and pronotum deflexed at about  $45^\circ$  from plane of body. Vertex nearly twice as wide as long, with large, deep discal foveae, slightly raised above median ocellus, next antennal sockets smoothly continuous with genae. Genae produced as large, stout processes, almost as long as vertex, contiguous basally, with numerous prominent setae, also with small lobe next eye, below antennal socket. Antennae slightly less than twice as long as width of head. Eyes of medium size, slightly recessive. Pronotum large, on same plane as vertex. Forewings broadly rounded, slightly over twice as long as wide, membrane thickened, translucent, punctate, thickly set with small points, veins prominent, raised; pterostigma small, narrow, Rs nearly straight to near apex then curved to margin, medial cell small,

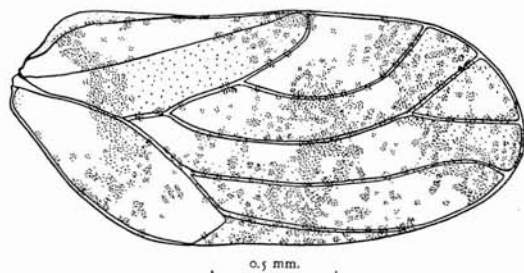


FIG. 6. Forewing of *Psylla carmichaeliae* n. sp.

cubital large, very broad. Hind wings nearly equaling forewings, very thickly set with minute points. Metatibiae without basal armature, 5 large, black, apical spines. Proxi-

mal segment of metatarsi with two black claws. Meracanthi unusually large.

Male proctiger long, swollen caudad. Forceps shorter than proctiger; in lateral view broad basally, almost evenly tapered to black blunt tip, curved mesad and caudad; in caudal view broadly touching basally then nearly straight to incurved black tips. Aedeagus quite simple, as figured. Female genital

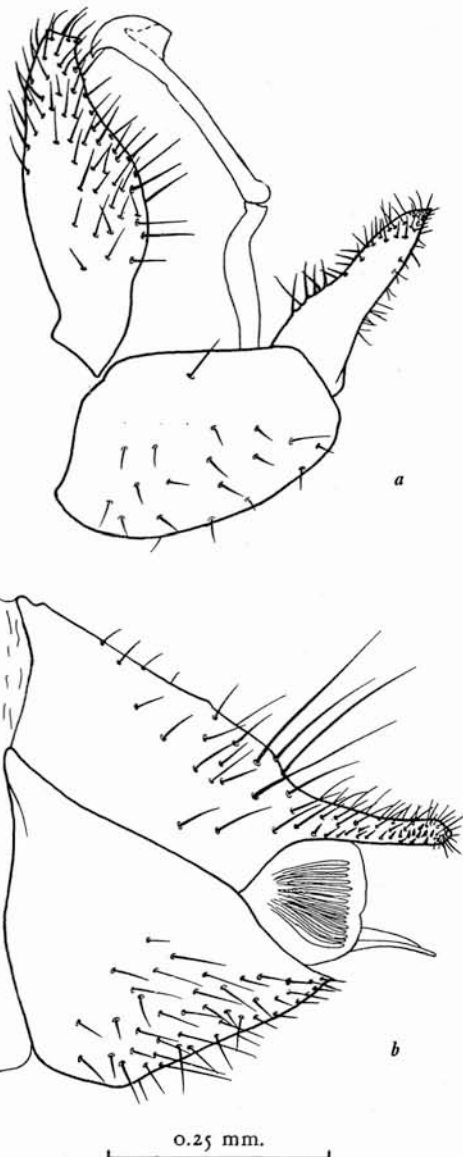


FIG. 7. *Psylla carmichaeliae* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.



segment large; dorsal valve somewhat attenuate in apical portion, apex rounded, upturned; ventral valve shorter than dorsal, sharp.

HOLOTYPE, female, allotype, male, numerous paratypes, Crown Range, December 6, 1950, E. S. Gourlay, beaten from *Carmichaelia* sp. Two additional paratypes taken from *Carmichaelia* sp., near Kingston, January 22.

HOST PLANT: *Carmichaelia* sp.

The degree of relationship of this form to that here designated as a subspecies is a puzzle. Whether intensive future work will show them to be distinct species or whether they will prove to be merely two of a large number of variants in a complex, inhabiting the various species of *Carmichaelia*, is problematical but I suspect it will prove to be an inseparable complex.

*Psylla carmichaeliae indistincta* n. subsp.

Fig. 8

Length to tip of folded wings 2.3–2.5 mm.

COLOR: General color orange-brown to yellow-brown. Vertex and pronotum mostly white with fuscous markings. Dorsum of thorax with fuscous and white longitudinal stripes. Femora and abdomen dark brown. Forewings white with dark brown spots as in typical subspecies but more concentrated.

STRUCTURE: Body surface punctate, shining. Head as wide as mesoscutum. Head and pronotum deflexed. Vertex with strong discal impressions, produced anteriorly, somewhat overhanging median ocellus, 0.6 as long as wide. Genae produced as large blunt processes, not contiguous at base but touching for about half their length, sharply depressed below plane of vertex, 0.6 as long as vertex, small projecting lobe next to eye. Antennae twice as long as width of head. Eyes small, not recessive. Pronotum wide, in same plane as vertex. Forewings twice as long as wide, broadly rounded, membrane thickened, translucent, punctate, thickly set with points; pterostigma present, short and broad, Rs

long, straight to near tip then curved to margin, medial cell small, cubital much larger, short and broad. Metatibiae without basal armature, with 5 black apical spines. Proximal segment of metatarsi with a pair of black claws. Meracanthi large.

Male proctiger long, swollen caudad. Forceps shorter than proctiger; in lateral view broad basally, narrowed to sharp tip, margins somewhat sinuate; in caudal view stout,

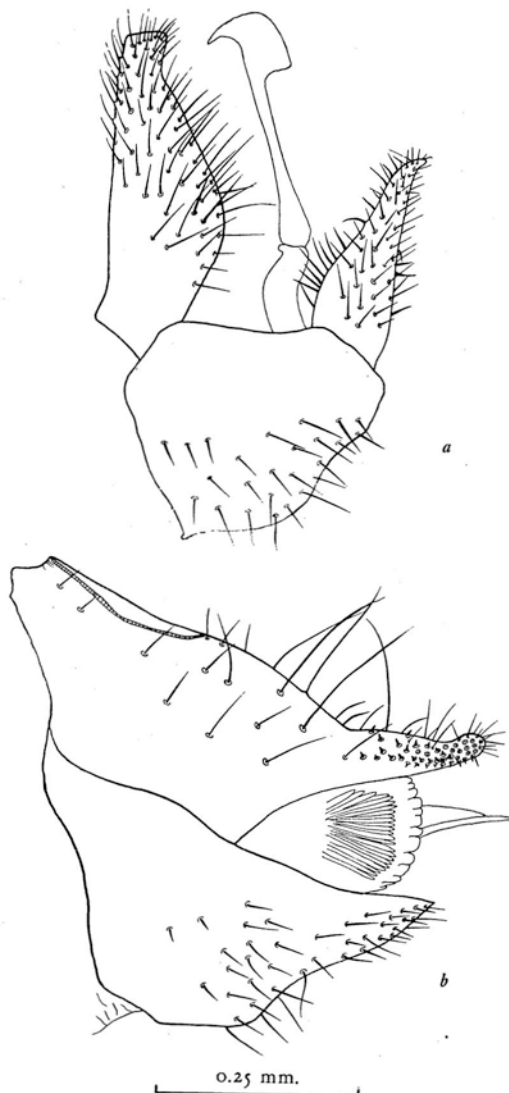


FIG. 8. *Psylla carmichaeliae indistincta* n. subsp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

broadly touching basally, nearly straight, tapering to black incurved tips. Aedeagus rather simple, as figured. Female genital segment large; dorsal valve attenuate apically, blunt; ventral valve shorter than dorsal, deep, sharp apically.

HOLOTYPE, female, allotype, male, numerous paratypes, Fox Glacier, February 7, taken on *Carmichaelia* sp. One specimen taken at Brown's Creek, Rai Valley, January 17, differs in having the forewing almost entirely dark, a narrower, longer pterostigma, somewhat shorter antennae.

HOST PLANT: *Carmichaelia* spp.

The large series of specimens at hand seems to be consistently different from the form taken east of the mountains. The chief differences are the size, the length of the vertex and the nature of its anterior margin, the position, shape, and size of the genal processes, the width of the pterostigma, the straight or upturned tip of the dorsal valve of the female genital segment, and the color, especially the degree of pigmentation of the wing.

This form has a marked resemblance in general appearance to *Arytaina robusta* Crawford of western North America.

Genus CTENARYTAINA Ferris and Klyver

1942 *Papiana* Tuthill, Bernice P. Bishop Mus., Occas. Papers 17: 78.

This genus was erected by Ferris and Klyver for *Rhinocola fuchsiae* Maskell and three other related species. They surmised correctly that *Rhinocola eucalypti* Maskell belonged to the same genus, but as they had no specimens they did not place it there. Although this was the genus *Rhinocola* of Maskell it does not encompass those Australian species assigned to *Rhinocola* by Froggatt. Of the five species known from New Zealand three are apparently endemic and two are undoubtedly introduced.

The genus *Papiana*, which I erected for a species from the Society Islands, is identical with *Ctenarytaina*. The two species which have been assigned to *Papiana*, *P. lulla* (Society

Islands) and *P. distincta* (Lau Islands), extend the range of the genus well into Polynesia.

### *Ctenarytaina fuchsiae* (Maskell)

1890 *Rhinocola fuchsiae* Maskell, New Zeal. Inst., Trans. 22: 162, pl. 12.

1932 *Ctenarytaina fuchsiae* Ferris and Klyver, New Zeal. Inst., Trans. 63: 55, pl. 14.

Length to tip of folded wings 1.6–2.1 mm.

This species has been well described by Maskell and by Ferris and Klyver. It is found throughout New Zealand on *Fuchsia* spp. from the time of the first opening of the leaf buds in the spring until past midsummer. I was unable to find living adults after the third week in January. Although it occurs on the host in myriads there is no evident injury.

HOST PLANTS: *Fuchsia excorticata* Linn., *F. procumbens* Hook.

### *Ctenarytaina clavata* Ferris and Klyver

1932 *Ctenarytaina clavata* Ferris and Klyver, New Zeal. Inst., Trans. 63: 55, 57, pl. 14.

Length to tip of folded wings 1.3–1.5 mm.

I found this minute species to be present on both *Leptospermum scoparium* and *L. ericoides* at many localities throughout New Zealand. The abundance varied considerably but, without exception, at least a few adults could be obtained by sweeping the hosts when they were in bloom.

HOST PLANTS: *Leptospermum scoparium* Forst. and *L. ericoides* A. Rich.

### *Ctenarytaina pollicaris* Ferris and Klyver

1932 *Ctenarytaina pollicaris* Ferris and Klyver, New Zeal. Inst., Trans. 63: 55, 57, pl. 14.

I made only one collection of this form although I swept its host plant throughout New Zealand. I obtained a few specimens at Okuti Valley on the Banks Peninsula, January 19, swept from *Leptospermum ericoides* in company with *C. clavata*. A few specimens are also at hand collected at Foxton, January 20, 1951, by R. A. Cumber.

HOST PLANT: *Leptospermum ericoides* A. Rich.



The comparative rarity of this species during the season 1950–51 must be unusual. Otherwise, it would be unable to maintain itself in competition with *clavata*.

**Ctenarytaina thysanura** Ferris and Klyver  
1932 *Ctenarytaina thysanura* Ferris and Klyver,  
New Zeal. Inst., Trans. 63: 55, 56, pls.  
14, 16.

Length to tip of folded wings 1.25 mm.

I did not collect any specimens of this minute species, but specimens were made available to me by Woodward, Cottier, and Miller. It apparently is quite common on its host throughout New Zealand.

HOST PLANT: *Boronia* sp.

**Ctenarytaina eucalypti** (Maskell)  
Fig. 9

1890 *Rhinocola eucalypti* Maskell, New Zeal.  
Inst., Trans. 22: 160.

Length to tip of folded wings 1.5–2.0 mm.

Maskell's extended description of this species is quite good. Additional data are: Antennae 1.3 times as long as width of head. Metatibiae with 5 short black apical spines. Proximal segment of metatarsi with 2 black claws.

Many specimens in all stages of develop-

ment were taken at several localities on both North and South Islands, including Tauranga, Palmerston North, and Ashburton. They appear to occur only on the young growth, the first specimens being taken in October.

HOST PLANT: *Eucalyptus globulus* Labill.

This species was also taken on *Eucalyptus bicostata* in Canberra, Australia.

### TRIOZINAE

A single ubiquitous genus, *Trioza*, represents this subfamily in New Zealand.

The well-developed radular areas on the forewings, alar radulae, which are so typical of this subfamily, are very strongly developed in many of the New Zealand species. The function of these structures is unknown but the presence of a raised area on the marginal vein at the base of the radula on many of these species suggests that they are stridulatory. As many of the species can be observed to rub their wings slightly when alive this seems more probable.

### Genus TRIOZA Förster

1879 *Powellia* Maskell, New Zeal. Inst., Trans.  
11: 223.

In his 1880 paper on Coccidae, Maskell transferred his genus *Powellia*, which he established on nymphal material, from the

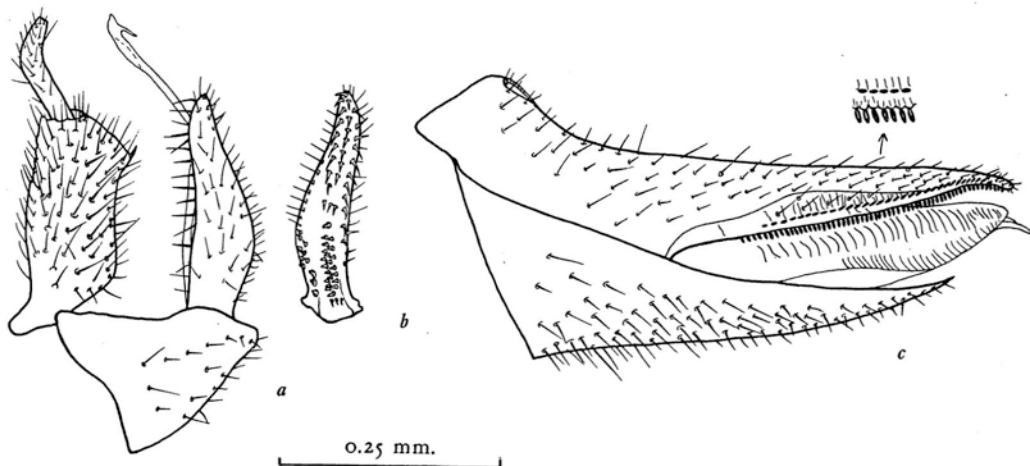


FIG. 9. *Ctenarytaina eucalypti* (Maskell). *a*, Lateral aspect of male cauda; *b*, inner aspect of clasper; *c*, lateral aspect of female cauda.



Coccidae to the Aleyrodidae. Subsequently he obtained adults, realized his error, and in his paper on the Psyllidae in New Zealand (1890) he synonymized *Powellia* with *Trioza*. Ferris and Klyver, however, considered that the New Zealand species constituted a separate genus and therefore resurrected *Powellia*. The bases of their distinction were the presence of serrations of greater or lesser prominence on the base of the metatibia and the position of the large spines at its apex. These are not limited to the New Zealand forms nor are they, in my opinion, sufficient reasons for maintaining a separate genus.

The genus *Trioza* is one of the largest, perhaps the largest, genus in the family. The forms found in New Zealand show considerable diversity. With one exception (*T. adventicia* n. sp.), they are limited to endemic hosts and are undoubtedly endemic species. A very large number of species appears to have developed on the native Compositae, principally the shrubby ones. This is a family of plants which is not known to support many species of psyllids in other parts of the world.

### *Trioza vitreoradiata* (Maskell)

1879 *Powellia vitreo-radiata* Maskell, New Zeal. Inst., Trans. 11: 223, pl. 8, fig. 22.

1890 *Trioza pellucida* Maskell, New Zeal. Inst., Trans. 22: 164, pl. 11.

1903 *Trioza alexina* Marriner, New Zeal. Inst., Trans. 35: 305, pls. 33, 34.

1932 *Powellia vitreoradiata* Ferris and Klyver, New Zeal. Inst., Trans. 63: 39, 42, pls. 7, 8, 16.

Large numbers of this species were taken throughout New Zealand on various species of *Pittosporum*, throughout the season, for I suspected that there were probably different species present on the different members of the host genus. After very careful examination of many specimens from many localities, from Spirit's Bay to Oban, and from at least four species of *Pittosporum*, I am convinced that there is but one species of psyllid present.

Minor variations in structure are present, of course, but none that seems significant or that is constant. The sclerotic points on the membrane of the forewing, for example, range from very prominent points over all the membrane to complete absence except in the extreme base, with a great range of intensity and a considerable range in size. There is no correlation with season, locality, or host plant.

I can add nothing to the very complete description given by Ferris and Klyver except that the size range is 3.25 to 4 mm. and that the color variation is even greater than they stated, ranging to almost entirely black except for the thoracic pleura and the edges of the abdominal tergites.

HOST PLANTS: *Pittosporum* spp., i.e., *P. eugenoides*, *P. tenuifolium*, *P. crassifolium*, *P. colensoi*.

Maskell recorded it as also occurring on *Discaria toumatou* and *Geniostoma ligustrifolium*. Two species, both here described as new, have been taken from *Discaria toumatou*. The male of the more common one, *Trioza discariae* n. sp., is almost certainly the source of Maskell's drawing of the male which Ferris and Klyver were at a loss to explain, resorting to an assumption of remarkable error on the part of Maskell. I have been unable to find any psyllid associated with *Geniostoma* but am confident that when it is rediscovered it will prove to be a distinct species.

In addition to the specimens collected by myself, I have had for study material from the various collections in New Zealand. These are from several other localities and from several species of *Pittosporum*.

### *Trioza discariae* n. sp.

Fig. 10

1879 *Powellia vitreoradiata* Maskell (in part), New Zeal. Inst., Trans. 11: 223.

1890 *Trioza pellucida* Maskell (in part), New Zeal. Inst., Trans. 22: 164, pl. 11.

Length to tip of folded wings 2.25–2.5 mm.

**COLOR:** General color of head and thorax tan with dark brown markings. Abdomen dark brown. Wings hyaline.

**STRUCTURE:** Body surface finely punctate, with moderate pubescence, more or less dusted with powdery wax. Head wider than mesoscutum. Vertex strongly impressed discally, slightly produced anteriorly. Genal processes large, conical, acute, divergent, 0.66 as long as vertex. Eyes large, hemispherical. Postocular areas large. Antennae slightly less than twice as long as width of head. Pronotum depressed slightly below plane of vertex. Forewings rounded apically, 2.66 times as long as wide, membrane with points in small area at base and along claval suture; veins prominently setate, Rs of moderate length, slightly sinuate, marginal cells nearly equal. Hind wings with prominent points on membrane, venation unusually distinct. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines.

Male proctiger short, broadly produced

caudad. Forceps shorter than proctiger; in lateral view broad with two broad lobes on anterior margin, lower one arising from mesal surface, blunt, black tooth apically; in caudal view stout, with large, sharp, black tooth near apex on inner margin; in dorsal view with two large, sharp, black teeth projecting inward, anterior one somewhat below other, inner surface with many long setae. Female genital segment short, dorsal valve excavate below anus, downcurved to blunt apex; ventral valve shorter than dorsal, sharp.

**HOLOTYPE**, male, allotype, female, numerous male and female paratypes, Halley's Lake, Cobb River Valley, January 8, from *Discaria toumatou*; Crown Range and near Kingston, January 22, many adults and nymphs from *Discaria toumatou*; adults from *Discaria toumatou*, Skipper's Bridge, December 7, 1950, E. S. Gourlay.

**HOST PLANT:** *Discaria toumatou* Raoul.

This is a very common and abundant species on its host and almost certainly is the form which Maskell lumped with *vitreoradiata*. His drawing of the male forceps which Ferris and Klyver explained away as being an illusion is actually only an exaggeration of the structure of the inner face of the forceps of this species seen from the proper angle.

### *Trioza emarginata* (Ferris and Klyver)

1932 *Powellia emarginata* Ferris and Klyver, New Zeal. Inst., Trans. 63: 39, 42, pls. 8, 9.

Length to tip of folded wings 3.5 mm. (male).

Only one specimen of this distinct species was taken. This one individual was taken from a mixture of shrubs (*Pittosporum*, *Nothopanax*, *Hebe salicifolia*, etc.) forming the edge of a tongue of *Nothofagus* bush at the start of the path to Tawhai Falls, Tongariro National Park, November 26, 1950. It was taken while I was collecting specimens of *Trioza hebicola* on the *Hebe*. It is quite close to *T. vitreoradiata* as indicated by Ferris and Klyver. This, the sixth specimen known to have been captured,

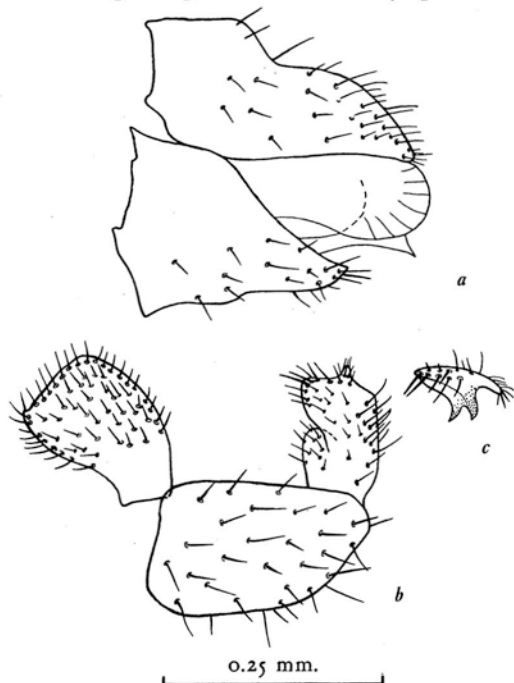


FIG. 10. *Trioza discariae* n. sp. a, Lateral aspect of female cauda; b, lateral aspect of male cauda; c, dorsal aspect of tip of clasper.



extends its range from Arthur's Pass to Ruapehu. It is undoubtedly abundant on its host which is as yet unknown.

***Trioza falcata* (Ferris and Klyver)**

Fig. 11

1932 *Powellia falcata* Ferris and Klyver, New Zeal. Inst., Trans. 63: 39, 42, pls. 8, 9.

Length to tip of folded wings 4.0–4.5 mm.

COLOR: General color green to reddish brown unicolorous or commonly yellow-brown with green abdomen. Wings hyaline except light brown band along posterior margin.

STRUCTURE: Body surface finely rugose, with very short, sparse pubescence, longer on head and legs, white powdery wax deposit prominent along sides. Head slightly narrower than mesoscutum. Vertex deeply impressed discally, not overhanging anteriorly. Genal processes nearly parallel with plane of vertex, large, conical, blunt, 0.66 as long as vertex. Antennae twice as long as width of head. Pronotum short, depressed. Wings large. Forewings rounded apically, 2.5 times as long as wide, membrane with minute points behind cubitus and in some specimens a few in marginal area around to Rs (females seem to show these more than males); Rs long, sinuate, cubital cell somewhat larger than

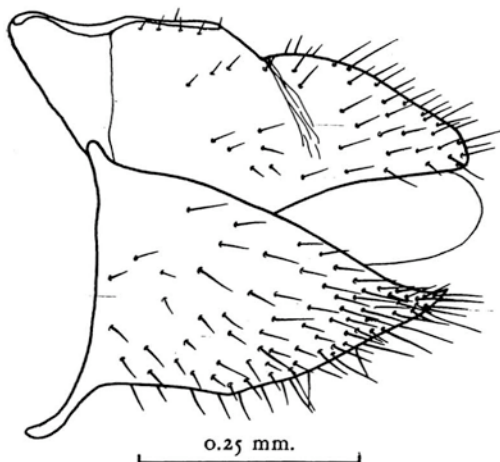


FIG. 11. Lateral aspect of female cauda of *Trioza falcata* (Ferris and Klyver).

medial. Hind wings thickly set with prominent points. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines.

Male genitalia as described and figured by Ferris and Klyver. Female genitalia as in *T. equalis* (Ferris and Klyver) except with sharp sulcus across dorsal valve between anus and apex, ventral valve with distinct hump.

Specimens of the species were taken abundantly at Peel Forest, South Canterbury, January 20; Mead's Landing, Lake Hawea, January 22; Whiskey Gulley, Tapanui, January 25; Tuatapere, January 28; Oban, January 31; near Tokanui, February 3.

Earlier in the season I was unable to obtain a single specimen in the type locality or elsewhere on North Island. This is perhaps because of a seasonal appearance. Without exception, those captured were taken on plants in shade or partial shade.

HOST PLANT: *Aristolelia serrata* (Forst.) Oliv.

As recorded by Ferris and Klyver, this species forms pit galls on the leaves of its host.

***Trioza equalis* (Ferris and Klyver)**

1932 *Powellia equalis* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 47, pl. 11.

The female specimen described by Ferris and Klyver under this name is very close to *falcata* and is probably that species. Two points in their description differ from the numerous females of *falcata* at hand, however; therefore, the name is maintained and perhaps future collecting and the eventual location of Myers' collection will serve to clarify the status of *equalis*.

In *equalis* the membrane in the apical half of the forewing is set with points [punctate]. In some of the females of *falcata* there are points in the marginal area as far as the radial sector, especially in the region of the alar radulae. A more important difference lies in the genitalia. The dorsal valve of *equalis* is figured by Ferris and Klyver as nearly straight to a bluntly pointed apex, whereas that of



*falcata* has a prominent transverse sulcus caudad of the anus and is much more blunt apically. The ventral valve of *falcata* has a very prominent hump which is lacking in *equalis*.

The unique type was collected at Arthur's Pass.

HOST PLANT: Unknown.

*Trioza hebicola* n. sp.

Fig. 12

Length to tip of folded wings 4.0–4.5 mm.

COLOR: Pale green, yellowish ventrally.

Wings hyaline.

STRUCTURE: Body surface finely punctate, with sparse fine pubescence. Head narrower than mesoscutum. Vertex with strong discal impressions, bulging anteriorly. Genal processes divergent, conical, over 0.66 as long as vertex, as long as medial suture. Antennae slightly over twice as long as width of head. Thorax strongly arched. Pronotum vertical. Forewings large, very broadly rounded, less than 2.5 times as long as wide; Rs long, sinuate, cubital cell larger than medial. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines (several of the specimens at hand show 4 inner spines on one tibia).

Male proctiger strongly produced caudad, with prominent apical epiphysis. Forceps shorter than proctiger; in lateral view strongly bilobed, caudal lobe broadly rounded, anterior lobe more slender and with sharp, black, incurved tip, with basal anterior lobe from mesal face one half as long as main anterior lobe; in caudal view very broad, rounded apically, long sclerotized ridge on mesal surface near apex. Female genital segment small, shorter than rest of abdomen, dorsal valve sinuate, blunt, with prominent, raised beak apically; ventral valve nearly as long as dorsal, scoop-shaped.

HOLOTYPE, male, swept from *Hebe salicifolia* near Tawhai Falls, Tongariro National Park, December 3; allotype, female, reared from pit gall on *Hebe salicifolia*, same locality, November 26; several male and female para-

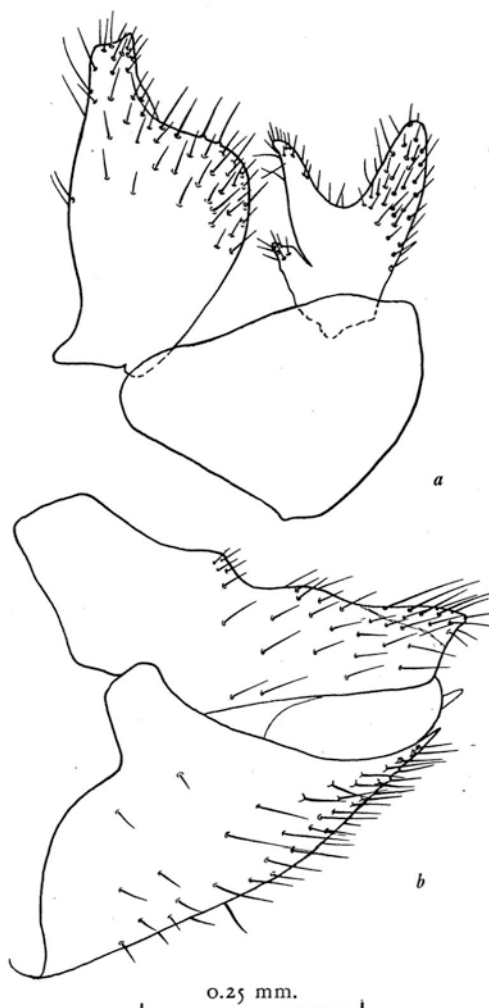


FIG. 12. *Trioza hebicola* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

types, mostly reared from material taken November 23–26 and December 5–10.

HOST PLANT: *Hebe salicifolia* Forst.

Although I searched for psyllids on *Hebe salicifolia* throughout New Zealand, this is the only spot in which I obtained any specimens from it. This is a most remarkable localization. The galls produced by the nymphs are very prominent. They are thimble-shaped, up to 0.25-inch long, and project downward on the leaf. The nymphs are nearly round, surrounded by long wax tubes, and usually concave dorsally, as they accommodate themselves to the shape of the pit.

This species is a variation from the *vitreo-radiata* type, the male genitalia in particular being merely a more extreme form of the same structure pattern.

***Trioza bifida* (Ferris and Klyver)**

1932 *Powellia bifida* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 39, 43, pls. 8, 9, 10.

Supplementary notes on the species are given.

Length to tip of folded wings 2.75–3.75 mm.

COLOR: Color variable from general light green with light brown markings to yellowish brown with dark brown markings. Abdomen usually dark. Forewings fumate.

STRUCTURE: Body quite robust, surface shining, prominently punctate or imbricate. Head narrower than thorax. Vertex with strong discal impressions, bulging anteriorly. Genal processes slender, divergent, 0.66 as long as vertex. Antennae 1.6 times as long as width of head.

This very distinct species was taken in large numbers from *Olearia avicenniaefolia* at the following localities: Takaka Hill, near Nelson, January 8 and 13; Whangamoia Saddle, January 16; near Kingston, January 22; near Oban, January 29, 30, 31; Arthur's Pass, February 5; Fox Glacier, February 7. A series of 12 males and females was taken from *Metrosideros umbellata* Car. near the top of Arthur's Pass on the Otira side. One hour was spent in obtaining this short series as I thought it possible that it was a distinct species inhabiting the rata. As there was *O. avicenniaefolia* in the area, no significance can be attached to this collection. As this is a very active species, such chance occurrence on plants other than the host is to be expected. Occasional specimens were taken on several other plants, especially other species of *Olearia* where they were growing intermingled with *avicenniaefolia*.

On March 7, on the seashore near The

Glen, Nelson, adults, eggs, and nymphs were taken in great numbers on *Shawia* [*Olearia*] *paniculata*. In this collection and those made at Arthur's Pass and Fox Glacier there are two distinct sizes, the smaller females being as small as the smallest males. The smaller form (2.75–3.0 mm.) is much darker in color, but no other difference is discernible.

HOST PLANTS: *Olearia avicenniaefolia* Hook. and *Shawia* [*Olearia*] *paniculata* Cheesem.

***Trioza gourlayi* n. sp.**

Fig. 13

Length to tip of folded wings 3.0–3.25 mm.

COLOR: General color reddish brown to dark brown, vertex lighter. Genal processes green, black tipped. Forewings yellowish, transparent.

STRUCTURE: Body surface finely punctate, more or less completely dusted with powdery wax, with short, sparse pubescence. Head wider than mesoscutum. Vertex with very strong discal impressions. Genal processes slender, conical, divergent, 0.66 as long as vertex. Antennae 1.33 times as long as width of head. Eyes large, hemispherical. Pronotum very short, strongly depressed. Forewings rounded apically, membrane with prominent points except along veins; Rs long, sinuate, marginal cells nearly equal. Metatibiae with prominent basal serrations, 1 outer and 3 inner apical spines.

Male genitalia large. Proctiger long, straight, narrowed apically to small epiphysis. Forceps long (shorter than proctiger); in lateral view slightly curved cephalad, deeply notched at apex, anterior lobe blunt, posterior acute, black; in caudal view touching basally, stout then narrow, nearly straight to black tips. Female genital segment longer than rest of abdomen, large basally, strongly narrowed and attenuate in apical half, dorsal valve longer than ventral, spinose, tip blunt, ventral valve with numerous very small setae toward apex, tip sharp.

HOLOTYPE, female, allotype, male, 4 female and 2 male paratypes, Skipper's Bridge, De-

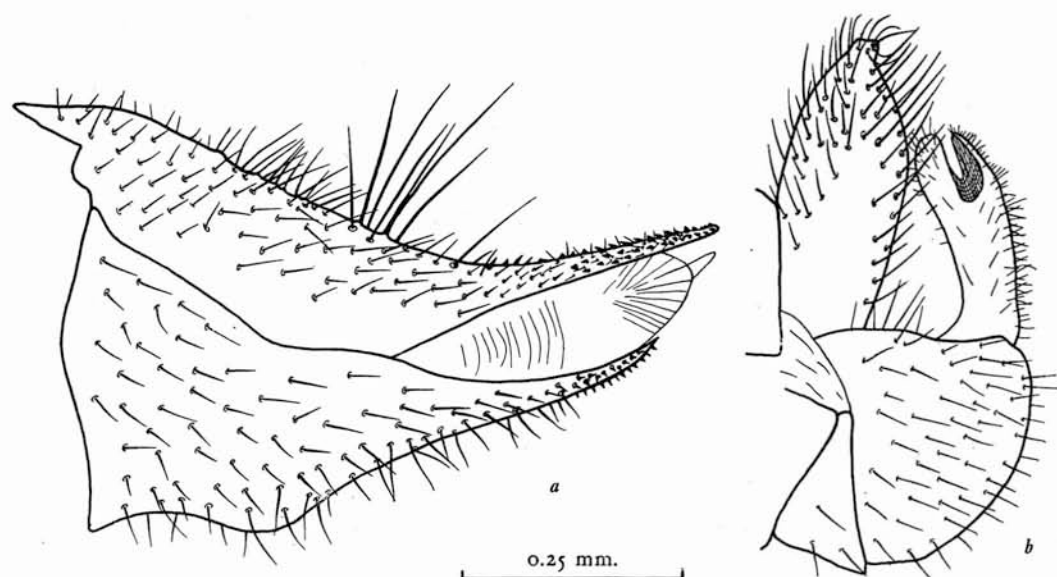


FIG. 13. *Trioza gourlayi* n. sp. a, Lateral aspect of female cauda; b, lateral aspect of male cauda.

ember 7, 1950, E. S. Gourlay, beaten from *Discaria toumatou* in company with *T. discariae*. Although I collected in the same area 6 weeks later, I was unable to find any of this species.

HOST PLANT: *Discaria toumatou* Raoul (probable).

This species is quite close to *T. bifida*. The genitalia of the female are quite different, however, and the male forceps, although similar, are more slender, curved, and the apical notch is more oblique.

It is with much pleasure that I name this species for the collector E. S. Gourlay.

### *Trioza panacis* Maskell

Fig. 14

1890 *Trioza panacis* Maskell, New Zeal. Inst., Trans. 22: 167, pl. 12, figs. 1-12.

1932 *Powellia panacis* Ferris and Klyver, New Zeal. Inst., Trans. 63: 48.

Length to tip of folded wings 3.75-4.5 mm.

COLOR: Uniformly green to yellow. Forewings slightly embrowned except along veins.

STRUCTURE: Body surface minutely rugose, with very short scattered pubescence. Head as wide as mesoscutum. Vertex short, with round discal impressions, bulging anteriorly.

Genal processes short, conical, divergent, 0.66 as long as vertex. Antennae very slightly less than twice as long as width of head. Pronotum not depressed below plane of vertex. Forewings large, narrowly rounded apically, 2.7 times as long as wide, membrane with points on area behind cubitus; Rs slightly sinuate, cubital cell distinctly larger than medial, Cu<sub>1</sub> very strongly arched. Hind wings long, with prominent points throughout. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines.

Male proctiger large with prominent apical epiphysis, caudal wings wide, flattened. Forceps shorter than proctiger; in lateral view broad, nearly straight sided, prominent basal bulge anteriorly, caudal margin obliquely excavate in apical third, anterior margin round at tip to blunt, black, apical tooth, heavy, stiff setae on anterior margin, short stiff setae on caudal and mesal surfaces; in caudal view stout, nearly straight to slightly incurved sharp black tips, basal bulge on lateral surface; in dorsal view tips black, blunt, truncate to slightly excavate. Female genital segment small, valves almost equal in length; dorsal margin of dorsal valve strongly sinuate, apex



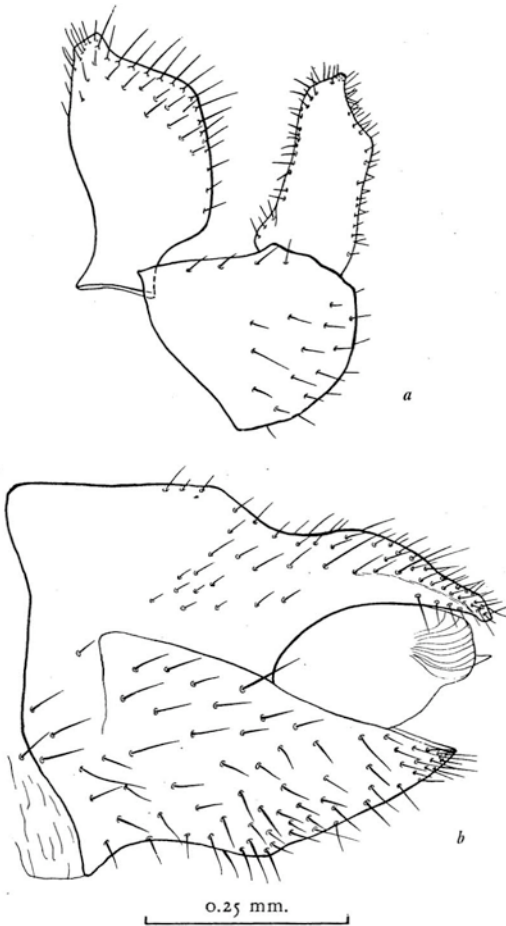


FIG. 14. *Trioza panacis* Maskell. *a*, Lateral aspect of male cauda; *b*, lateral aspect of female cauda.

downcurved, blunt; ventral valve strongly sinuate also, apex sharp.

Nymph (last stadium) 2.4 mm. long, 1.8 mm. wide across wing pads. The nymph is very distinctive, being large, thick, very strongly convex dorsally, and highly pigmented as described by Maskell. The prominent rounded protuberances on the thoracic dorsum are the most easily seen of the peculiar structures present. There is also a less prominent pair on the head. The derm of the dorsum is grossly punctate throughout. The venter is minutely spinulose. Small setae scattered over dorsal surface including thoracic and cephalic protuberances. The abdominal segments are distinctly marked. The

wing pads extend cephalad well beyond the eyes, nearly equaling the tip of the head. Marginal setae goblet-shaped, those on caudal margin somewhat more elongate. Anal pore ring with ends as wide as center, transverse, flattened, broadly rounded at ends, consisting of a single row of pores enclosing a row of small teeth.

**SPECIMENS EXAMINED:** Neoholotype, female, and allotype, male, Manapouri, January 24, 1951. The female was reared from a nymph on *Pseudopanax* sp. Many other specimens were taken at various localities, all on *Pseudopanax*. Very few were found on the juvenile trees but they were abundant on mature specimens of the host at the time it was in bloom.

**HOST PLANT:** *Pseudopanax* spp.

Maskell in describing *T. panacis* did not distinguish between this species and the very closely related form found on *Nothopanax* spp. Ferris and Klyver had three female specimens of the latter which they described under the name *Powellia irregularis*. Fortunately Maskell included a rather good description of the nymph which is, in this species, much more distinctive than the adult. The highly convex body form, strong pigmentation, and especially the prominent protuberances on the thorax make it unmistakable. On the basis of his having actually described and figured this nymph rather than the other (the description of the adult serving for either equally well) the epithet is established for the species which inhabits *Pseudopanax*. As confirming evidence, there is in the Maskell material at the Cawthron Institute a small pill box labeled "*Trioza panacis* (psyllid of Lancewood)," which contains numerous nymphs of this species.

Ferris and Klyver mention the presence of points ("punctations") present on the membrane of the forewing of *irregularis*. This character (which seems to hold in this instance) plus their excellent drawing of the female genitalia leave no doubt as to the identity of *irregularis*.

As Maskell mentions, the nymphs very commonly retain the cast exuvia attached to the rear end of the body; not only the preceding one as he states but frequently a last stage nymph ("pupa" of Maskell) will have a long "tail" consisting of all its exuvia. L. J. Dumbleton first called this to my attention when giving me some nymphs which he had taken on the host plant in the Rai Valley. I have not encountered this phenomenon in psyllids heretofore but at least one of the other New Zealand species (*T. subvexa*) has the same habit, as I have found one or two nymphs in this condition.

***Trioza irregularis* (Ferris and Klyver)**

Fig. 15

1932 *Powellia irregularis* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 47, pl. 11.

The adult of this species is very similar to *T. panacis*. It is smaller than the latter (3.25–3.75 mm. long) and less robust in form. The vertex is proportionately narrower. The antennae are shorter in proportion to the width of the head, being about 1.5 times as long as the width of the head, whereas in *panacis* they are nearly twice as long. The forewings are more slender and somewhat more pointed at the apex, the cubital cell is smaller,  $Cu_1$  is less highly arched, the membrane is completely hyaline or very nearly so and has quite prominent points throughout except along the veins. (This is one of the most usable characters although, as pointed out previously, it is very variable in *vitreoradiata*, and its validity is therefore questionable.) In many individuals the thoracic dorsum is dark brown.

The genitalia show differences from *panacis*, largely of degree. The dorsal valve of the female is distinctly less sinuate and is straight apically. The male shows only slight differences as figured.

The nymphs of the two species are by far more distinctive than the adults. The last-stage nymph of *irregularis* is smaller (2 mm. long, 1.25 mm. wide across the wing pads),

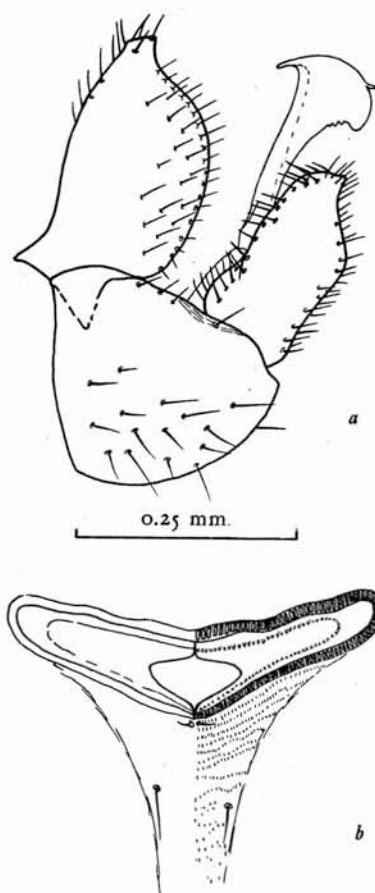


FIG. 15. *Trioza irregularis* (Ferris and Klyver). a, Lateral aspect of male cauda; b, anal pore ring of nymph.

is almost flat dorsally, lacks the dorsal protuberances, is finely punctate dorsally, is without dorsal setae, has numerous slender setae over the venter in addition to the minute spinules present, the wing pads do not extend forward beyond the eyes, and the anal ring is of a different shape, being more slender and angular.

Many specimens were taken throughout New Zealand from North Auckland to Stewart Island, at all possible altitudes and throughout the season, from various species of *Nothopanax*, including *N. arboreum*, *N. simplex*, *N. edgerleyi*, *N. colensoi*, *N. anomolum*. The nymphs cause the formation of pits on the leaves, within which they lie, surrounded

by a prominent white fringe of wax tubes.

HOST PLANTS: *Nothopanax* spp.

*Trioza schefflericola* n. sp.

Fig. 16

On December 5, 1950, I collected a series of adults, nymphs, and eggs, from *Schefflera digitata* in the Mamaku Hills. This was the only certain occurrence of a psyllid on this host which I discovered although I believe that an earlier collection near Mangamuka was from both *Nothopanax* and *Schefflera*. Both the nymphs and adults looked quite distinct in the field. The nymphs, bright orange in color, were very flat, on the upper surface of the leaves, without any conspicuous fringe of wax tubes. They had not produced any visible structural malformation of the host tissue but each was surrounded by a discolored necrotic area. Careful examination in the laboratory, however, shows them to be very similar to *T. irregularis*. The adults have proportionately much larger wings, the membrane of the forewings is without points except behind cubitus, and the forewing is yellow. The shape of the anal ring of the nymph is different, being more strictly transverse and not narrowed toward the ends. All the other differences I have found are simply slight differences of degree.

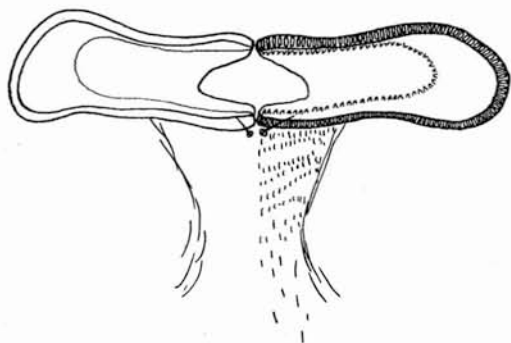


FIG. 16. *Trioza schefflericola* n. sp. Anal pore ring of nymph.

It is with considerable doubt that I designate this as a distinct species. Only further work and some biological information can

definitely determine its status. I believe that such information will indicate that it is distinct. If it does not, the sinking of this epithet into synonymy will cause no confusion.

HOLOTYPE, female, allotype, male, several male, female, and nymphal paratypes, Mamaku Hills, December 5. Nymphs taken from the same host plant are in the Plant Diseases Division Collection: Titirangi, August 5, 1945, M. W. Carter.

HOST PLANT: *Schefflera digitata* Forst.

*Trioza alseuosmia* n. sp.

Fig. 17

Length to tip of folded wings 3.25–3.5 mm.

COLOR: Body straw, abdomen greenish in some specimens. Forewings yellow.

STRUCTURE: Body small, surface finely rugose. Head large, as wide as mesoscutum. Vertex with strong discal impressions, bulging anteriorly. Lateral ocelli large, well forward on vertex. Genal processes small, stout, somewhat divergent apically, 0.5 as long as vertex (almost as long as medial suture). Antennae twice as long as width of head. Eyes large, bulging, hemispherical. Postocular and occipital areas strongly developed. Thorax strongly arched. Pronotum large, nearly vertical, not depressed below plane of vertex. Forewings very large in proportion to body, angular apically, 3 times as long as wide, membrane without points, surface very finely roughened; Rs moderately long, sinuate, marginal cells large, cubital slightly larger than medial. Metatibiae with prominent serrate basal carina, 1 outer and 3 inner apical spines.

Male proctiger long. Forceps much shorter than proctiger; in lateral view broad, anterior and caudal margins slightly sinuate, apex truncate with blunt black tooth at caudal margin; in caudal view stout, evenly arched to blunt black tips. Elbow of aedeagus highly sclerotized, brown or black. Female genital segment shorter than rest of abdomen; dorsal valve straight to narrowly blunt apex; ventral



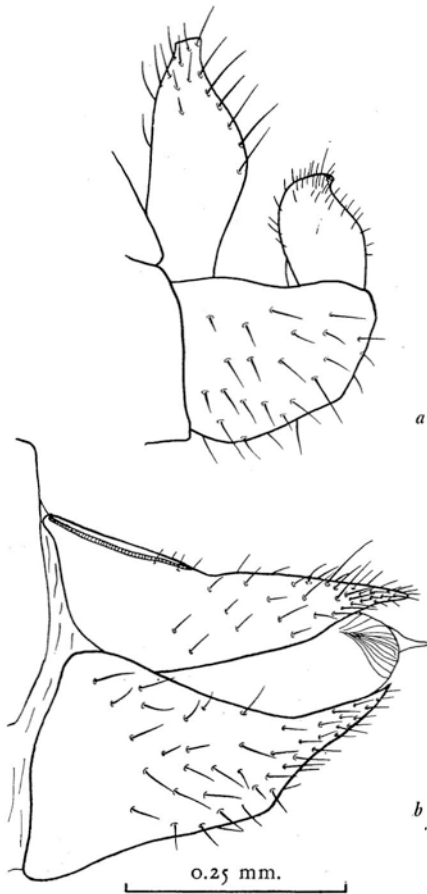


FIG. 17. *Trioza alseuosmiae* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

valve long, almost equaling dorsal, apical two fifths sharply upturned, scoop-shaped.

HOLOTYPE, male, allotype, female, several male and female paratypes, Mamaku Hills, near Rotorua, December 5. One male, Mamaku Gorge, December 6. Last-stadium nymphs, Mamaku Hills, September 26. All specimens taken from *Alseuosmia*.

HOST PLANT: *Alseuosmia macrophylla* A. Cunn.

The nymphs, which were taken from the host in early spring, when it was just beginning to bloom, were in pits on the leaves. At that time no adults were present. Upon returning to the same plants in December, adults were found. No specimens could be captured a short distance away in a portion

of the same bush which had been cut over so that the sun had been let in, although the *Alseuosmia* was very abundant and in a thriving condition. All the specimens taken were in dense bush where the sunlight does not penetrate. It would seem that the ecological requirements of this species limit it to the host plant growing as underbrush in dense bush.

### *Trioza acuta* (Ferris and Klyver)

1932 *Powellia acuta* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 39, 43, pl. 10.

The only collection made of this species was October 29, at which time it was taken in large numbers from its host plant, *Cassinia leptophylla* R. Br., on a ridge above Croisilles (or Croixelles). A large percentage of those taken were copulating at that time.

This is a small but robust species. It ranges in length from 2.0 to 2.25 mm.

### *Trioza parvipennis* n. sp.

Fig. 18

Length to tip of folded wings 2.75–3.75 mm.

COLOR: General color cinereous to straw color, abdomen darker dorsally. Wings somewhat fumate. Some specimens mostly green.

STRUCTURE: Body robust, finely pubescent, surface rugulose. Head large, wider than mesoscutum, scarcely deflexed. Vertex broad with strong discal impressions, bulging anteriorly. Genal processes large, conical, blunt, 0.75 as long as vertex. Antennae slightly longer than width of head. Eyes large. Thorax quite flat for genus. Pronotum wide, not depressed below plane of vertex. Forewings small, narrowed in apical third, rounded apically, 2.5 times as long as wide, membrane rugose, semitransparent, thickly set with points except along veins, points especially large near margin of wing between Rs and M<sub>1</sub>, in some specimens similar to the alar radulae, veins setate; Rs long, somewhat sinuate, marginal cells very small, approximately equal. Hind wings 0.75 as long as

forewings, with points throughout. Metatibiae with serrate basal carina, 2 principal teeth, 1 outer and 3 inner apical spines.

Male proctiger long, surface minutely imbricate, caudal margin produced. Forceps large, 0.6 as long as proctiger; in lateral view gradually broadened from near base to obliquely truncate apex; in caudal view broad, slightly curved to truncate apex, medial edge blunt, black; in dorsal view medial edge black with two teeth, one broad, blunt, caudal and one sharp, medial. Aedeagus as figured. Female genital segment large, as long as rest of abdomen, entire segment more or less bent dorsally. Both valves swollen basally then acuminate, styliform to sharp apices, dorsal longer than ventral, latter strongly papillate, former less so. Ovipositor exceeding valves, lateral palps slender, heavily sclerotized, rugose, exceeding dorsal valve, acute apically.

HOLOTYPE, male, allotype, female, 2 male and 6 female paratypes taken from *Senecio adamsii* near Lake Peel, approximately 4,000 feet, January 13.

HOST PLANT: *Senecio adamsii* Cheeseman.

This species resembles *T. acuta* Ferris and Klyver in its robust form, small wings, and general form of genitalia. It was taken in small numbers from isolated specimens of its host plant scattered on the steep mountain-side about a mile below Lake Peel. The host plant was at first thought to be a species of *Olearia* but Lush has determined it as *Senecio adamsii*.

### *Trioza subacuta* (Ferris and Klyver)

1932 *Powellia subacuta* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 39, 44, pl. 10.

Some supplementary notes to the original description are:

Length to tip of folded wings 3.25–3.75 mm.

COLOR: General color white to yellow. Abdomen, especially in male, often chocolate brown. Wings hyaline. Body more or less

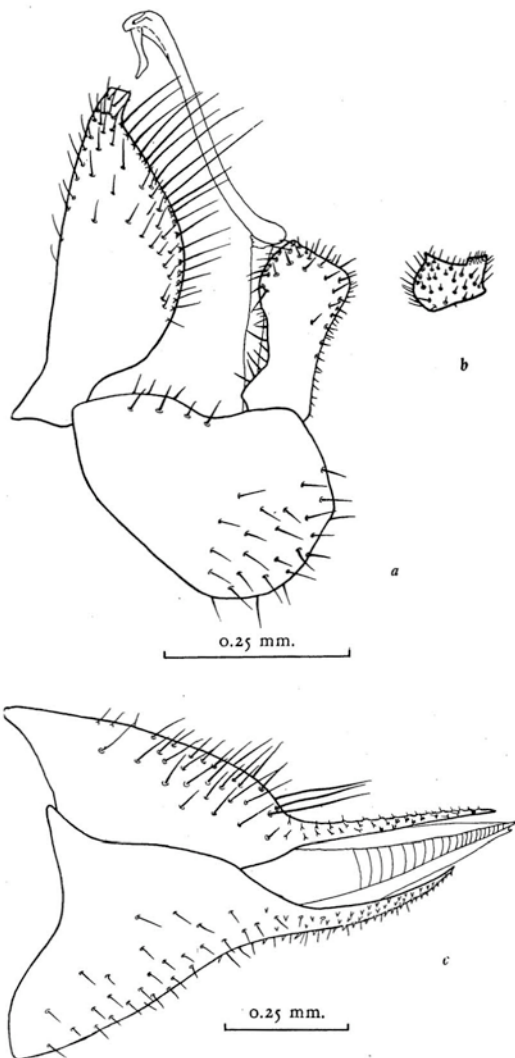


FIG. 18. *Trioza parvipennis* n. sp. a, Lateral aspect of male cauda; b, dorsal aspect of tip of clasper; c, lateral aspect of female cauda.

covered with powdery wax, especially prominent on first abdominal tergite.

STRUCTURE: Body slender, surface rough, with short sparse pubescence. Head large, as wide as mesoscutum. Genal processes slender, divergent, acute, 0.8 as long as vertex. Antennae very slightly over twice as long as width of head. Postocular areas small. Pronotum short, much depressed below plane of vertex. Forewings nearly 3 times as long as wide, bluntly angular. The apex of the male

forceps is heavily sclerotized, black, and much more obliquely truncate than Ferris and Klyver's figure would indicate.

HOST PLANT: *Brachyglottis repandra* Forst.

This species has been taken in abundance on rangiora, *Brachyglottis repandra*, at several localities. Many nymphs, a few adult females, and several mummified males were taken near Nelson on October 19. Adults were present on rangiora in abundance at Rotorua, December 4. Other collections are: Waitakere Hills, near Auckland, September 29, 1950, W. Cottier; Cape Rainga, October 3, 1950, W. Cottier and L. D. Tuthill; near Mangamuka, October 4; Waipoua Forest, October 5; Buller's Bush, near Levin, October 27; Palmerston North, several dates in October and November; lower reaches of Mount Ruapehu, November 18; near Taumarunui, November 26; Takaka Hill, near Nelson, January 13.

I think there is no doubt of the identification of this species. I cannot understand, however, the statement by Ferris and Klyver that it is "very close to *P. acuta*," as it differs markedly in body form, head characters, and in size and shape of the wings. It is very similar to the following several species which are found on other shrubby Compositae, i.e., *Olearia* and *Senecio*.

### *Trioza doryphora* (Maskell)

Fig. 19

1880 *Powellia doryphora* Maskell, New Zeal. Inst., Trans. 12: 291, 301.

Length to tip of folded wings 3.5–3.75 mm.

COLOR: General color white to greenish white or pale yellow. Dorsum of abdomen brown to black. Males darker. Forewings slightly embrowned except along veins.

STRUCTURE: Surface of body rough, with short, sparse pubescence, more or less covered with powdery wax. Head narrower than mesoscutum. Vertex impressed discally, slightly bulging over base of genae. Genal processes slender, conical, divergent, 0.7 as long as

vertex. Antennae slightly less than twice as long as width of head. Eyes large, hemispherical. Postocular area large. Pronotum strongly depressed, below plane of vertex. Mesonotum strongly produced anteriorly, overhanging pronotum. Forewings large, broadly rounded, 2.5 times as long as wide; membrane roughened, set with minute points except along veins; Rs very long, sinuate, cubital cell somewhat larger than medial. Hind wings large, transparent, set with prominent points. Metatibiae with somewhat

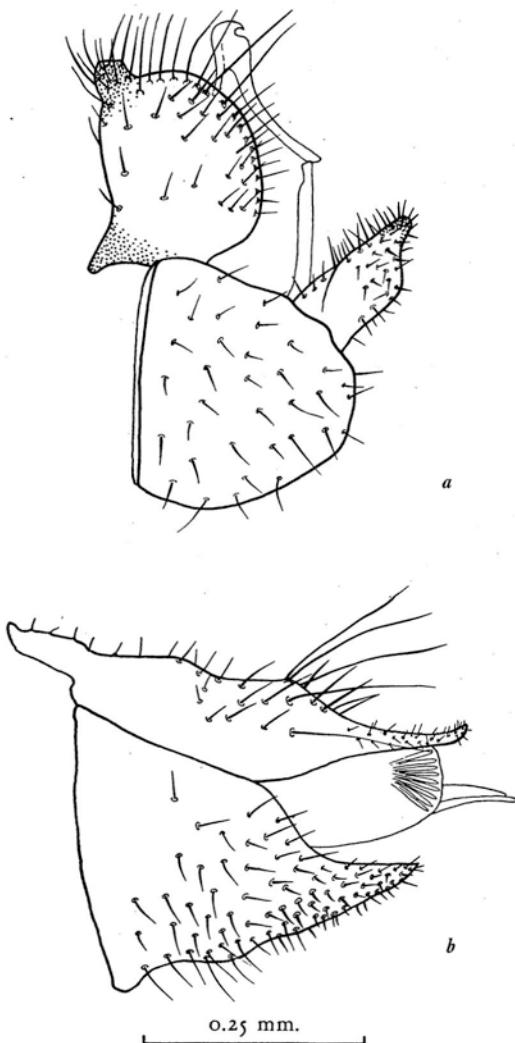


FIG. 19. *Trioza doryphora* (Maskell). a, Lateral aspect of male cauda; b, lateral aspect of female cauda.



oblique serrate basal carina, 1 outer and 3 inner apical spines.

Male genitalia large. Proctiger strongly, roundly produced caudad with small apical epiphysis, long setae along margin, black basally and anteriorly at apex. Forceps shorter than proctiger, in lateral view broad at base, nearly parallel margined, near apex caudal margin abruptly excavate, anterior margin continued as black, blunt, incurved tooth; in caudal view touching basally, stout, arched to sharp black tips, medial surface thickly set with setae. Female genital segment shorter than rest of abdomen, dorsal valve sinuate, apical portion attenuate, dark, upturned apically to sharp tip, a tuft of long setae on dorsal surface; ventral valve shorter than dorsal, sharp apically, set with short stout setae.

HOLOTYPE, male, allotype, female, reared from pseudogalls formed by the curling edges of young leaves of *Olearia ilicifolia*, taken at Waituhi Trig in the Huahangaroa Mountains, December 8; numerous paratypes, mostly males, with same data. Additional paratypes as follows: 4 swept from host plant at Waituhi Trig, December 8; numerous males and females swept and reared from host plant, near Homer Tunnel, January 23; numerous males and females swept and reared from host plant near Tokanui, February 3. A few nymphs, taken from galls on *Olearia ilicifolia*, Mount Egmont, April 22, 1946, by M. W. Carter, also seem to be this species.

HOST PLANT: *Olearia ilicifolia* Hook.

Through the courtesy of Dr. W. Cottier, I received some twigs of *Olearia ilicifolia* with galls and nymphs taken in a nursery at New Plymouth in October and the additional information that the insect was in epidemic proportion throughout the King Country where the plant is rather widely used as a hedge plant. The area near Waituhi Trig had an almost solid stand of the host and practically every young leaf was distorted by the feeding of the nymphs.

At Waituhi Trig, syrphid larvae were feeding on the nymphs, and one adult was reared out. It was determined by Dr. David Miller to be an undescribed species, apparently belonging to the genus *Platycheirus*.

This species is similar to *T. subacuta* (Ferris and Klyver) but is distinguishable by the much broader and rounded wings, the up-curved tip of the dorsal valve of the female, and by the shape of the male forceps.

In his paper of 1880, Maskell states "I have found, on *Olearia ilicifolia*, another species [of *Powellia*], wanting the long glassy fringe of the earlier stage, and having, instead, a row of lanceolate spines. I would call this species *P. doryphora*." It is probable that the species here described is the same as that which Maskell had, although this comment on the nymph would fit either of the two species known from *Olearia ilicifolia* equally well. The nymphs do bear lanceolate setae scattered over the abdomen, not merely a row on the margin. Actually these setae are surrounded in life by a short tube of wax secreted from their basal plate. By fixing Maskell's name on this species any possible future confusion will be avoided.

As there is no indication that any of Maskell's specimens of this species were preserved, types are designated from the material at hand.

#### *Trioza subvexa* n. sp.

Fig. 20.

Length to tip of folded wings 3.25–3.75 mm.

COLOR: General color cinereous to straw color, to green. Abdominal tergites more or less brown. Forewings slightly yellowish.

STRUCTURE: Body slender, small, surface rough, sparsely pubescent, and more or less covered with powdery wax. Head as wide as mesoscutum. Vertex nearly flat between lateral ocelli, bulging anteriorly over each antennal base. Genal processes slender, divergent, 0.8 as long as vertex, with long prominent setae. Eyes large, hemispherical.

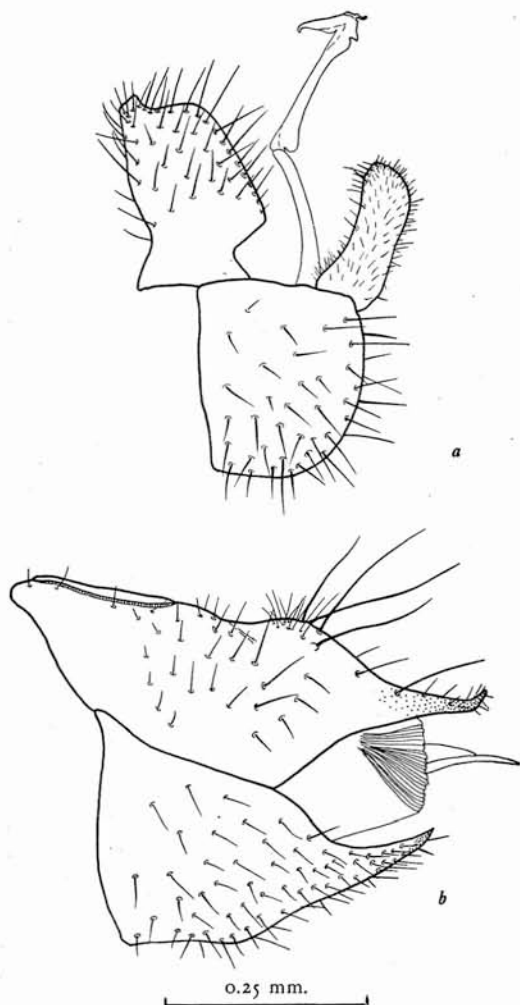


FIG. 20. *Trioza subvexa* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

Postocular area large. Antennae twice as long as width of head. Thorax strongly arched. Pronotum narrow, depressed below plane of vertex. Forewings large, narrowly rounded apically (not angular), 2.75 times as long as wide; membrane thickly set with points except along veins; Rs long and sinuate, cubital cell slightly larger than medial. Hind wings large, thickly set with points. Metatibiae with serrate basal carina, 1 outer and 2 inner apical spines.

Male genitalia of moderate size. Proctiger short, broadly produced caudad, somewhat

rectangular in lateral view. Forceps shorter than proctiger, with abundant fine setae; in lateral view nearly straight, caudal margin slightly sinuate, apex rounded, black; in dorsal view tips blunt, black margined; in caudal view stout, slightly arched, tips incurved, black, sharp. Female genital segment nearly as long as rest of abdomen; dorsal valve descending, with median hump bearing tuft of very long setae, apical third attenuate, black, apex sharply upturned, sharp; ventral valve shorter than dorsal, apical portion slender to sharp tip.

HOLOTYPE, male, allotype, female, 8 male and 5 female paratypes Takaka Hill (between Nelson and Takaka), January 8 and 13; 2 female paratypes, Whangamoa Saddle, near Nelson, January 16; 1 male and 2 female paratypes, Arthur's Pass, February 5. All these specimens were swept from *Olearia avicenniaefolia*. Numerous additional paratypes, males and females, were reared from pseudogalls formed by the curled edges of young leaves of *Olearia avicenniaefolia* taken at Fox Glacier on February 7. Nymphs of all stages were present at that time. Nymphs and adults were also taken at Waiho by L. J. Dumbleton on November 20, 1950.

HOST PLANT: *Olearia avicenniaefolia* Hook.

This species is very close to *Trioza subacuta* (Ferris and Klyver) but may be distinguished from it by the less angular wings and the genitalia—the dorsal valve of the female is upturned apically instead of straight, the male forceps are rounded rather than obliquely truncate apically.

#### *Trioza compressa* n. sp.

Fig. 21

Length to tip of folded wings 3.75–4 mm.

COLOR: General color light brown with abdomen dark dorsally and either bluish green or cinereous ventrally. Forewings distinctly fumate.

STRUCTURE: Body surface rough, more or less covered with powdery wax. Head as wide as mesoscutum. Vertex strongly impressed,

bulging anteriorly. Genal processes long, slender, acute, divergent, nearly as long as vertex. Antennae slightly over twice as long as width of head. Eyes large. Postocular areas prominent but smaller than in related species. Thorax well arched. Pronotum very strongly depressed below vertex. Forewings large, bluntly angular, with prominent points on membrane except along veins, 2.66 times as long as wide; Rs long, sinuate, marginal cells about equal. Metatibiae with prominent teeth basally, 1 outer and 3 inner apical spines.

Male genitalia large. Proctiger strongly swollen caudad, with small apical epiphysis. Forceps shorter than proctiger; in lateral view broad and straight basally, obliquely truncate to blunt, black apex; in caudal view broad basally, narrowed to apex; outer margin strongly arched in basal half then nearly straight to touching apex, inner margins touching basally, excavate, then produced, then evenly tapered to apex, very stout setae on broad lobe thus formed; in dorsal view tips black, truncate. Female genital segment short, about two thirds as long as rest of abdomen; dorsal valve steeply descending to short, straight, styliform apex, with small hump bearing tuft of long setae; ventral valve nearly as long as dorsal, very strongly compressed midway, apical portion brown, thickly set with short retrorse setae.

HOLOTYPE, male, allotype, female, 3 male and 3 female paratypes, Whangamoa Saddle, January 16, taken on *Olearia arborescens*. Additional paratypes: Falls Creek in upper Hollyford Valley, January 23; Oban, January 29, taken on *Olearia arborescens*, in great numbers; 1 female taken at The Neck, Stewart Island, February 1, on *O. arborescens*; Arthur's Pass, February 5, taken on *O. arborescens*; Fox Glacier, February 7, taken on an *Olearia* determined by Lush as *O. macrodonta* or *arborescens* (as *macrodonta* is considered to be a hybrid between *arborescens* and *ilicifolia*, it is interesting that from the single bush of this form which I could discover I obtained *T. compressa*, a species which is abundant on

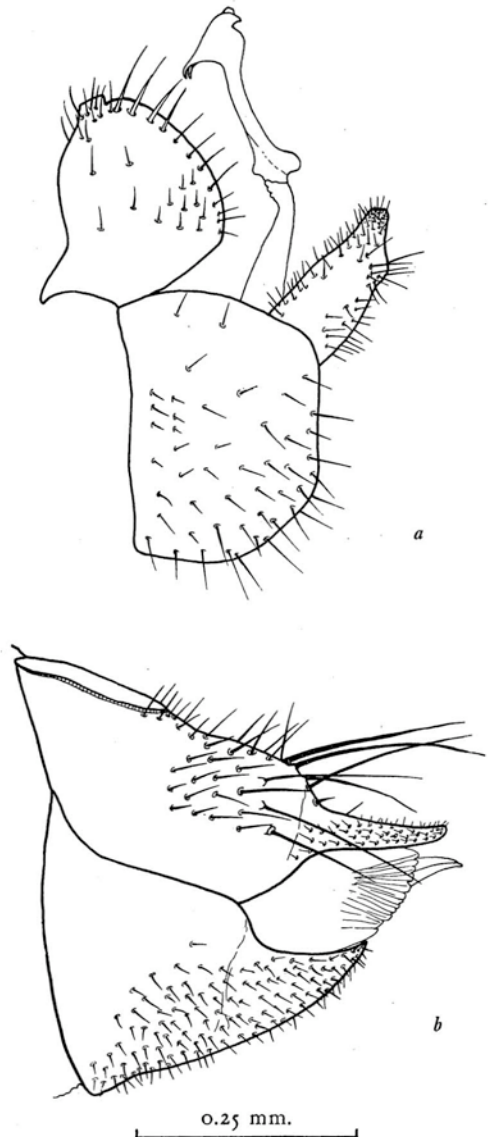


FIG. 21. *Trioza compressa* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

*arborescens*, and *T. crinita*, a species found otherwise only on *ilicifolia*); a series of males and females taken from *Olearia rani* growing in a gully at Te Waewae Bay, January 28.

HOST PLANTS: *Olearia arborescens* Cock. and Laing and *O. rani* (A. Cunn.) Druce.

This seems to be closest to *T. subacuta*, *T. doryphora*, and *T. subvexa* but it is readily distinguished by its greater pigmentation, more



robust body, larger size, and different genitalia.

*Trioza crinita* n. sp.

Fig. 22

Length to tip of folded wings 3.5–4.25 mm.

COLOR: General color dark brown with legs and margins of most sclerites buff. Genal processes white, black tipped. Forewings evenly fumate. Many females much less pigmented, of a general buff color. Granular wax deposit prominent on many specimens, especially along sides and on first abdominal tergite.

STRUCTURE: Body moderately robust with sparse, short, stiff pubescence, surface shining, finely rugulose. Head large, slightly narrower than mesoscutum. Vertex strongly impressed discally, caudal margin sharp, raised, smoothly rounded down anteriorly. Genal processes conical, blunt, scarcely divergent, 0.8 as long as vertex. Antennae twice as long as width of head. Eyes large. Post-ocular areas large. Pronotum strongly depressed below plane of vertex. Forewings large, 2.5 times as long as wide, broadly rounded apically, membrane set with very small points except along veins; Rs long, sinuate, marginal cells equal. Hind wings thickly set with large points. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines.

Male genitalia large. Proctiger with small apical epiphysis, very broadly produced caudad, with marginal fringe of very large setae. Forceps shorter than proctiger; in lateral view slender, slightly enlarged before apex then caudal margin oblique to blunt apex; in caudal view stout, nearly straight except incurved and black at tips, touching basally; in dorsal view tips blunt. Aedeagus as figured. Female genital segment large, as long as rest of abdomen; dorsal valve with strong hump bearing tuft of large setae, apical third styliform with large retrorse points; ventral valve strongly compressed from apex almost to base along ventral side,

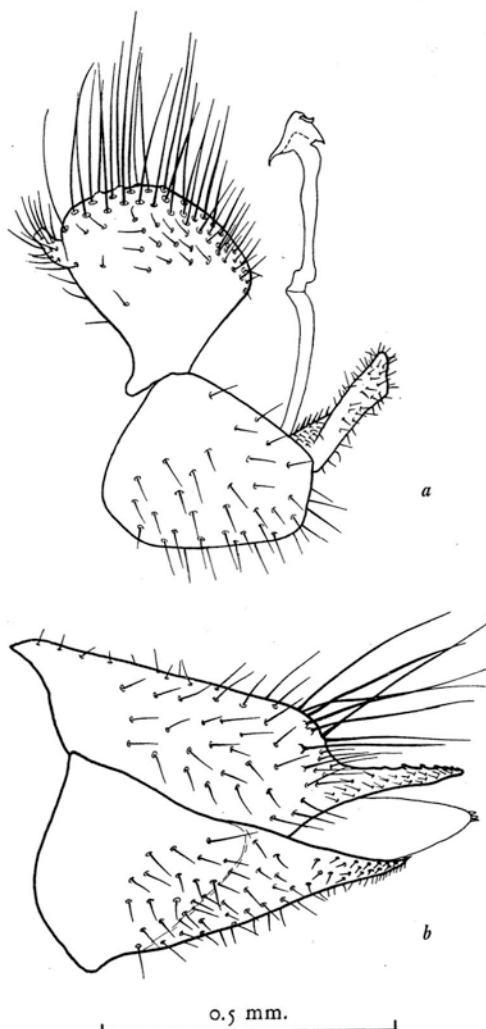


FIG. 22. *Trioza crinita* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

forming a straight keel, apical portion heavily sclerotized and thickly set with short retrorse spines.

HOLOTYPE, male, allotype, female, 10 male and 7 female paratypes swept from *Olearia ilicifolia* about 1 mile below the Homer Tunnel in the upper Hollyford Valley, January 23; numerous additional males and females taken from the same host near Tokanui, February 3, and Arthur's Pass, February 5. From a single specimen of *Olearia macrodonta* below Fox Glacier, 2 males and 2 fe-

males, February 7; (see discussion under *T. compressa*).

HOST PLANT: *Olearia ilicifolia* Hook.

The large size, broad wings, and type of genitalia distinguish this species from all others known except *T. scobina* and *T. latiforceps*, from both of which it differs in color and details of structure.

*Trioza scobina* n. sp.

Fig. 23

Length to tip of folded wings 3.75–4.50 mm.

COLOR: General color yellowish buff. Abdomen somewhat darker, especially tergites. Forewings yellowish.

STRUCTURE: Body surface rough, shining, with short sparse pubescence. Head large, nearly as wide as mesoscutum. Vertex with deep discal foveae, bulging but not overhanging anteriorly. Genal processes small, divergent, acute, 0.66 as long as vertex. Antennae slightly over twice as long as width of head. Eyes of moderate size, postocular areas large. Pronotum long, vertical, depressed below vertex. Forewings large, very broadly rounded, only slightly more than twice as long as wide, membrane thickened, without points; Rs long, sinuate, marginal cells equal. Hind wings large, thickly set with minute points. Metatibiae with basal serrations, 1 outer and 3 inner apical spines.

Male genitalia large. Proctiger with small apical epiphysis, very broadly produced caudad, with marginal row of large setae. Forceps shorter than proctiger; in lateral view straight, obliquely narrowed apically, tip blunt; in caudal view stout, nearly straight, incurved apically to sharp tips; in dorsal view apices black tipped, sharp. Aedeagus as figured. Female genital segment large, longer than rest of abdomen; dorsal valve with tuft of large setae, apical third styliform, downcurved, with heavy retrorse sclerotic points; ventral valve nearly as long as dorsal, swollen basally then laterally compressed, apical por-

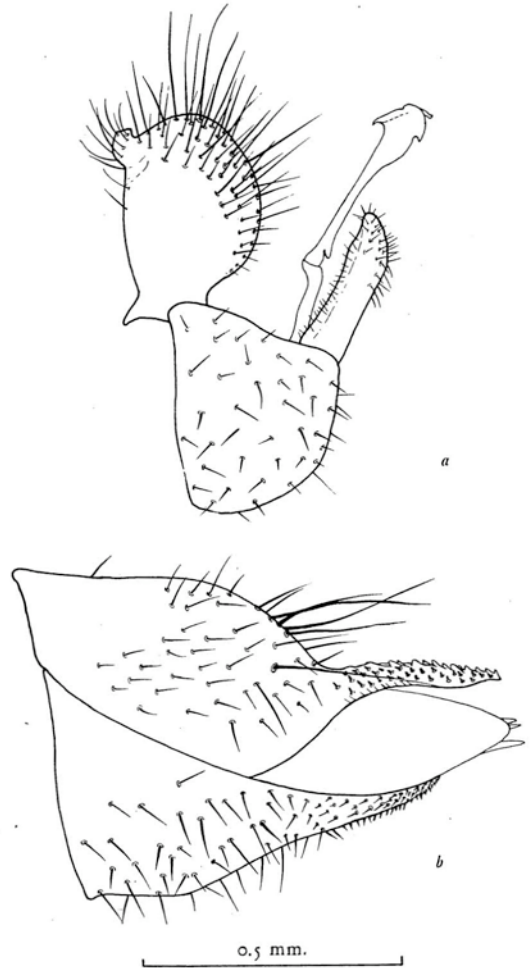


FIG. 23. *Trioza scobina* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

tion heavily sclerotized, thickly set with fine retrorse spines.

HOLOTYPE, male, allotype, female, numerous male and female paratypes from *Olearia lacunosa*, January 10 and 12, on and near Balloon Hill in the Mount Arthur Tableland area.

HOST PLANT: *Olearia lacunosa* Hook.

Although quite close to *T. crinita* this species is easily distinguished from the latter by the larger size, broader wings, shorter genal processes, the downcurved apical portion of the dorsal valve of the female, and the broader, sharp-pointed male forceps.

*Trioza latiforceps* n. sp.

Fig. 24

Length to tip of folded wings 3.50–4.25 mm.

COLOR: General color buff. Abdominal dorsum dark brown. Forewings yellowish.

STRUCTURE: Head large, nearly as wide as mesoscutum. Vertex with deep discal foveae, bulging anteriorly. Genal processes short, stout, conical, divergent from base, 0.66 as long as vertex. Antennae twice as long as width of head. Eyes moderate in size. Postocular areas large. Pronotum long, vertical. Forewings large, broadly rounded, 2.5 times as long as wide, membrane thickened, without points; Rs long, somewhat sinuate, marginal cells equal. Hind wings large, thickly set with minute points. Metatibiae with small, serrate, basal carina, 1 outer and 3 inner apical spines.

Male proctiger long, moderately produced caudad, with moderate-sized fringing setae. Forceps shorter than proctiger; in lateral view narrow basally, caudal margin straight, anterior margin strongly swollen to truncate apex; in caudal view stout, nearly straight to incurved, black-tipped apex; in dorsal view tips broad, shallowly excavate, forming slight black tooth at each end. Female genital segment longer than rest of abdomen, large basally, apical half attenuate, styliform; dorsal valve with tuft of long setae on basal portion, apical portion straight to sharp apex with very small retrorse spines near tip; ventral valve shorter than dorsal, apical styliform portion with short setae, upturned at tip.

HOLOTYPE, male, allotype, female, 3 male and 6 female paratypes, near Balloon Hill, January 10 and 12, on *Olearia lacunosa*.

HOST PLANT: *Olearia lacunosa* Hook.

In sweeping the plants of *Olearia lacunosa* from which this species, *T. scobina*, and *T. flavida* were taken, it was obvious that two species were present because of the difference in size and color. This species and *scobina* were not distinguished, however, until the material

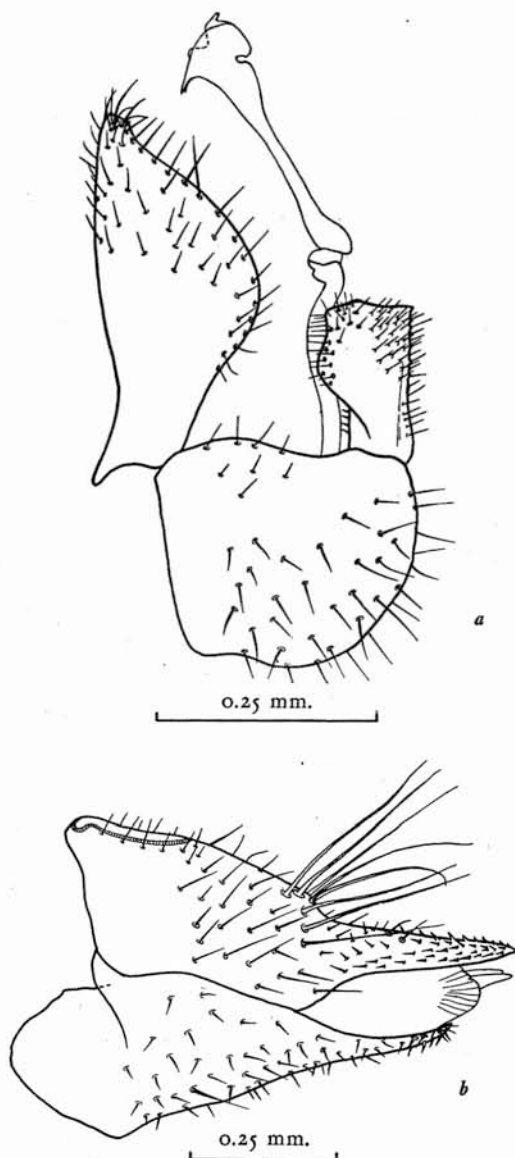


FIG. 24. *Trioza latiforceps* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

was mounted and examined under the microscope. Although in size and color it does resemble *scobina*, it is readily distinguished from it by the smaller and more slender wings, the much stouter genal processes, and by the genitalia which are quite different in both sexes.



*Trioza flavida* n. sp.

Fig. 25

Length to tip of folded wings 2.75–3.75 mm.

COLOR: General color yellow. Abdomen yellow or greenish yellow. Genal processes white. Forewings yellow.

STRUCTURE: Body surface rugose, almost glabrous dorsally. Head large, slightly wider than mesoscutum. Vertex impressed discally, smoothly rounded to genae. Genal processes short, stout, divergent, scarcely over 0.5 as long as vertex. Antennae slightly less than twice as long as width of head. Eyes of moderate size. Postocular areas large, swollen. Pronotum vertical. Proepisterna strongly produced. Forewings broadly rounded, 2.5 times as long as wide, membrane with scattered points except along veins, veins setate. Hind wings large, set with minute points. Metatibiae with very small basal serrations, 1 outer and 3 inner apical spines.

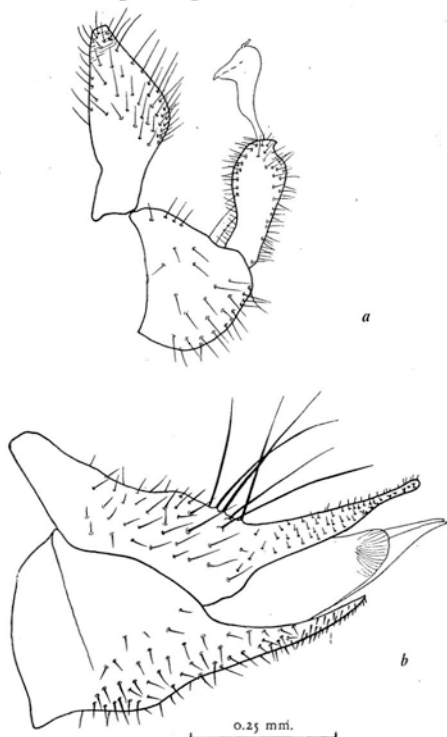


FIG. 25. *Trioza flavida* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

Male proctiger long, slender, moderately swollen caudad. Forceps large, about 0.5 as long as proctiger; in lateral view broadly clavate; in caudal view slender, arched to black tips; in dorsal view tips black, sharp, curved caudad. Female genital segment large, longer than rest of abdomen, valves large basally, slender and styliiform apically; dorsal valve without conspicuous hump on basal portion, with tuft of long setae, apical portion straight, slightly swollen at tip, with minute, straight setae; ventral valve shorter than dorsal, styliiform portion upcurved, with short stout setae.

HOLOTYPE, male, allotype, female, many male and female paratypes, taken from *Olearia lacunosa* near Balloon Hill, January 10 and 12.

HOST PLANT: *Olearia lacunosa* Hook.

This species, taken in company with the two preceding, was the most abundant at the time of collection. It is quite distinct from the other two although it seems to be nearer *latiforceps* than any of the other species known.

Although a few nymphs were found in pseudogalls formed by the curling of the edges of young leaves, I am unable to assign them to any one of the three species present on this host.

*Trioza australis* n. sp.

Fig. 26

Length to tip of folded wings 3.5–4.0 mm.

COLOR: General color cinereous with orange to brown markings on vertex, mesodorsum, and legs. Abdomen brown. Tip of proctiger and forceps black. Wings hyaline. Body more or less completely covered with powdery wax.

STRUCTURE: Body surface finely rugose and with short sparse pubescence. Head narrower than mesoscutum. Vertex with strong discal foveae, bulging over antennal bases and genae anteriorly. Genae produced as slender, conical, diverging processes, slightly over 0.8 as long as vertex. Antennae 1.7 times as long as width of head. Eyes large. Postocular

area large. Pronotum narrow, below plane of vertex. Forewings large, almost 3 times as long as wide, apex narrow but not acute, entire membrane, except along veins, with prominent points; Rs very long, sinuate, cubital cell slightly larger than medial. Hind wings 0.66 as long as forewings with similar points on membrane and on veins. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines.

Male genitalia large. Proctiger strongly swollen caudad, evenly narrowed to oblique apex. Forceps shorter than proctiger; in lateral view narrow basally, then swollen as figured, narrowed and incurved apically to blunt tips; in caudal view stout, nearly straight, tips incurved, sharp, touching. Female genital segment large, longer than rest of abdomen, swollen basally, slender apically; dorsal valve with apical third attenuate to sharp apex, with very short setae except for prominent cluster dorsally on basal portion; ventral valve shorter than dorsal, attenuate

portion thickly set with short, stout setae, apex acute.

HOLOTYPE, male, allotype, female, numerous paratypes, Oban, Stewart Island, January 29, 30, 31, where they were abundant on the common muttonbird plant.

HOST PLANT: *Senecio rotundifolius* Hook.

### *Trioza styligera* (Ferris and Klyver)

1932 *Powellia styligera* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 46, pl. 10.

Two females collected in sweeping alpine vegetation on Mount Ruapehu, at 4,700–5,000 feet, November 17, seem to be this species. Although the area was examined carefully on November 17, and the same and other similar areas were combed during the succeeding week, no additional specimens could be obtained.

The host is completely unknown but I think it probable that it is a species of *Olearia*, *Senecio*, or one of the closely related Compositae, as the species shows very marked similarity in structure to *T. australis* and other related forms.

### *Trioza fasciata* (Ferris and Klyver)

Fig. 27

1932 *Powellia fasciata* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 45, pl. 11.

Length to tip of folded wings 4.0–4.5 mm.

COLOR: Variable from uniformly green or light brown to very dark brown with scutellum and legs green, abdominal tergites margined with red. Forewings uniformly embrowned or with various dark brown fascia with remainder of membrane transparent, usually either entire posterior margin of wing broadly brown or two fascia across basal half.

STRUCTURE: Additions to the original description are: Head as wide as mesoscutum. Hind wings short, 0.6 as long as forewings. Metatibiae with serrate basal carina.

Male proctiger broadly produced caudad, with small apical epiphysis. Forceps very

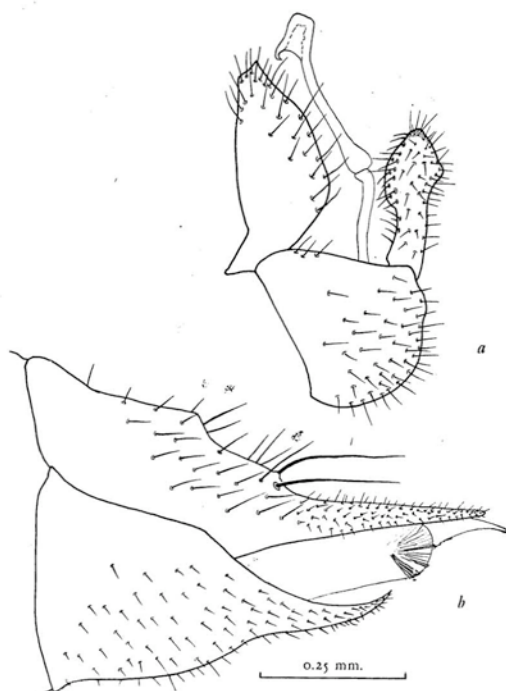


FIG. 26. *Trioza australis* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

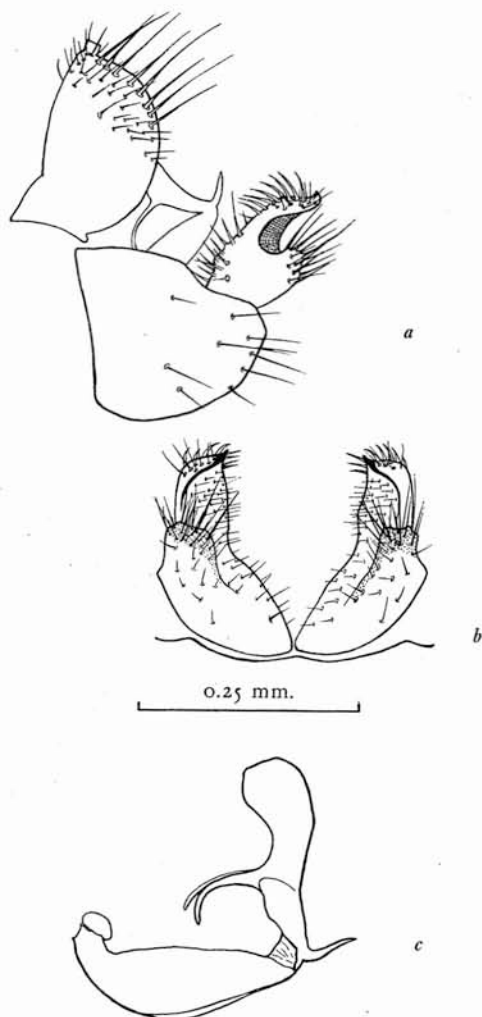


FIG. 27. *Trioza fasciata* (Ferris and Klyver). *a*, Lateral aspect of male cauda; *b*, caudal aspect of claspers; *c*, lateral aspect of aedeagus.

short, deeply cleft. Aedeagus of remarkable form as figured.

HOST PLANT: *Müblenbeckia australis* Meissn.

Several specimens of this very beautiful species were taken at Paiaka, the Phormium Research Station near Foxton, with the assistance of R. A. Cumber of that station, on May 4. They were beaten from a tangle of *Müblenbeckia australis* and *Urtica* growing in a *Phormium* swamp. First-stadium nymphs were found in small galls formed by the curling under of the edge of the leaf of the

*Müblenbeckia*. Additional specimens were taken by R. A. Cumber at the same spot May 5, 1950, at which time they were very abundant.

#### *Trioza decurvata* (Ferris and Klyver)

1932 *Powellia decurvata* Ferris and Klyver, New Zeal. Inst., Trans. 63: 37, 39, 44, pls. 9, 10.

Numerous specimens of this species were taken from its host plant, *Dracophyllum urvilleanum* var. *montanum* of Cheeseman (which is now considered to be a hybrid between *D. recurvum* and *D. longifolium*), on the slopes of Mount Ruapehu during the latter half of November at altitudes ranging from 3,000 to 4,700 feet. The only discrepancy between these specimens and the description and figures of Ferris and Klyver is in the length of the genal processes, which they record as fully as long as the vertex, but which are not over 0.8 as long in any of the specimens at hand. Additional data are: Length to tip of folded wings, 2.75 to 3.25 mm. Some individuals more or less green, especially the abdomen, others with forewings dark brown. Membrane of forewings thickened, points very small.

#### *Trioza obfusca* (Ferris and Klyver)

1932 *Powellia obfusca* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 46, pls. 9, 11.

No specimens of this species were taken unless the following form is identical. (See the discussion under *T. obscura*.)

#### *Trioza obscura* n. sp.

Fig. 28

Length to tip of folded wings 2.75–3.00 mm.

COLOR: General color brown, dark dorsally, lighter ventrally. Forewings brown, with small dark-brown anastomosing spots, to very dark, almost black. Hind wings dark brown along anal margin.

STRUCTURE: Body surface shining, punctate, with extremely short, sparse pubescence,



no wax apparent on any of the specimens at hand. Head and pronotum strongly deflexed. Head narrower than mesoscutum. Vertex flat, with circular discal impressions, slightly bulging anteriorly. Genal processes stout, conical, somewhat divergent, 0.7 as long as width of head. Eyes rounded. Postocular sclerites poorly developed. Thorax broad and rather flat. Pronotum not depressed below plane of vertex. Forewings rounded apically, with apex in costal half, 2.6 times as long as wide, membrane thickly set with very minute points, masked by pigment; Rs long, nearly straight, cubital cell much larger than medial. Metatibiae with small basal serrations, 1 outer and 3 inner apical spines.

Male genitalia large. Proctiger with prominent apical epiphysis, broadly rounded from base. Forceps shorter than proctiger; in lateral view broad, anterior margin rounded; in caudal view moderately stout, slightly arched to sharp black tips, caudal surface concave. Female genital segment large, almost as long as rest of abdomen, unusually thick dorso-ventrally; dorsal valve with distinct hump bearing long setae, apex slender, blunt, with numerous short, slender setae, ventral line straight; ventral valve shorter than dorsal, acute apically.

HOLOTYPE, female, allotype, male, 1 female and 2 male paratypes, from *Hebe angustifolia*, Takaka Hill, near Nelson, January 8 and 13. Additional paratypes: 2 from *Hebe angustifolia*, Whangamoia Saddle, near Nelson, January 16; 1 Tawhai Falls, Tongariro National Park, November 26, swept from mixture of shrubs; 7 swept from mixed shrubs at edge of *Nothofagus* forest, 30 miles S.E. of Taupo.

HOST PLANT: *Hebe angustifolia* A. Rich. (Probable.)

I think that this is probably *T. obfusca* (Ferris and Klyver). It is certainly very close to the latter, but I find four discrepancies between the specimens at hand and the description and figures of *obfusca*. These are: (1) The antennae of this form are barely 1.5 times as long as the width of the head (the range of

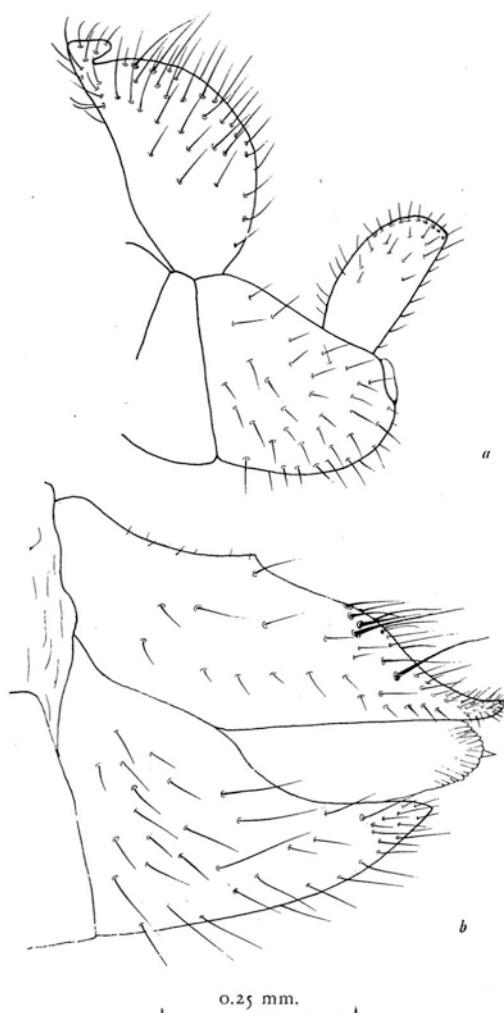


FIG. 28. *Trioza obscura* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

variation in the specimens at hand being 7.5:8.9 to 7.2:10.7) whereas *obfusca* has antennae "scarcely twice as long as width of head"; (2) the cubital cell of the forewing is larger than in *obfusca*; (3) the abdomen is strongly sclerotized as opposed to "weakly sclerotic" in *obfusca*; (4) the dorsal valve of the female genital segment has a definite hump dorsally, the distance from the anus to the tip is fully twice the length of the anus, the apex is not set with stout retrorse setae as

figured for *obfusca* but is as shown in Figure 28.

I am not prepared to assume a degree of error in the work of Ferris and Klyver which would allow ignoring of these differences, rather minor though they be, for I have found their paper to be very accurate. There are, of course, possibly other differences which may be found if the unique type of *obfusca* is ever located for comparison or if future collecting produces additional specimens, especially males. It will be less confusing in this circumstance, I believe, to establish a probable synonym than to designate these specimens as *obfusca*.

Four of the specimens taken on Takaka Hill were taken from a single, rather isolated plant of *Hebe angustifolia* at the edge of a small area of bush on January 8. On January 13 I returned to this plant and obtained two more specimens. Later in the week I captured two more from the same species of plant on Whangamoa Saddle, where I had gone to search for them. In both localities I swept all the surrounding plants in search of additional specimens, without success. In dissecting several of the females, I found that they were gravid; in one specimen an egg was lying in the ovipositor. I think it probable, therefore, that *Hebe angustifolia* is a host. The series taken southeast of Taupo was swept from a tangled mixture of shrubs which included a species of *Hebe* which may be *angustifolia* or *salicifolia* or something else.

### *Trioza colorata* (Ferris and Klyver)

Fig. 29

1932 *Powellia colorata* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 47, pls. 9, 11.

Length to tip of folded wings 2.5–2.75 mm.

One female taken at Arthur's Pass is identical with the one described by Ferris and Klyver. Another taken with her, and hundreds of others taken elsewhere, all differ in having a clear band across the dark forewing from the base of the cubital cell to the costa, wider

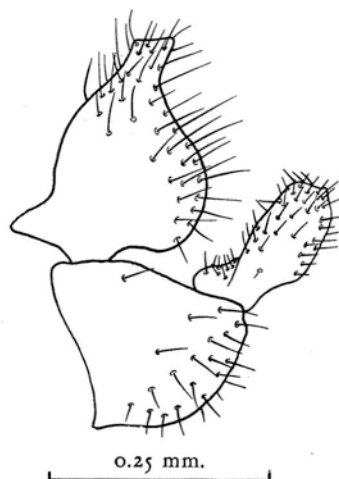


FIG. 29. Lateral aspect of male cauda of *Trioza colorata* (Ferris and Klyver).

at the costa, in addition to the two clear areas on the clavus and at the base of the costa. This coloration gives the insects a distinct black and white banded appearance in the net.

The male proctiger is strongly produced caudad. The forceps are shorter than the proctiger; in lateral view broad, narrowed toward base, with broad anterior basal lobe, with small black tooth apically; in caudal view broad, nearly straight, tips sharp, black, incurved.

Many specimens were taken from *Dacrydium biforme* at 3,000 to 4,700 feet on Mount Ruapehu, November 17 to 27; 2 females taken from the same host, Arthur's Pass, February 5; many males and females from *Dacrydium bidwillii*, Balloon Hill, January 10 and 12.

HOST PLANTS: *Dacrydium biforme* Pilger and *D. bidwillii* Hook.

### *Trioza dacrydii* n. sp.

Fig. 30

Length to tip of folded wings 2.5–3.0 mm.

COLOR: General color greenish yellow. Antennae and legs sooty. Veins of forewings black, membrane slightly fumate.

STRUCTURE: Body surface finely punctate. Head wider than mesoscutum. Vertex with

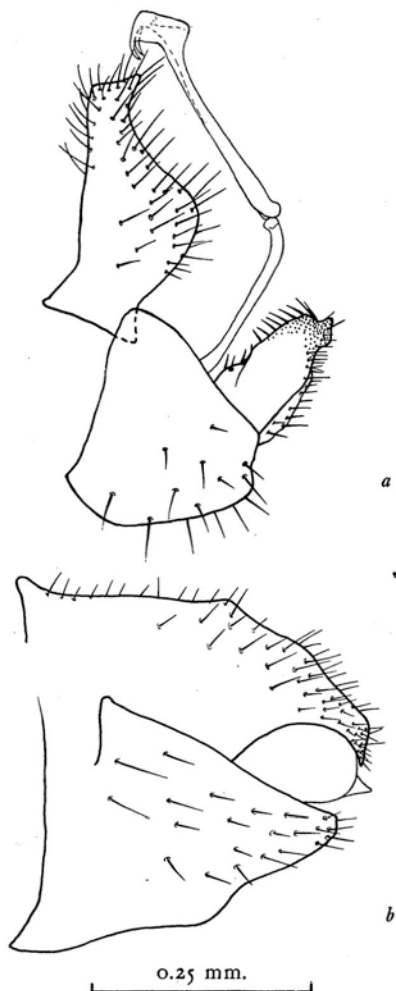


FIG. 30. *Trioza dacrydii* n. sp. a, Lateral aspect of male cauda; b, lateral aspect of female cauda.

very strong discal impressions, slightly bulging anteriorly. Genal processes conical, divergent from base, 0.6 as long as vertex, longer than medial suture. Antennae twice as long as width of head. Postocular sclerites large, strongly produced caudad. Pronotum short, not strongly depressed. Forewings broadly rounded apically, 2.5 times as long as wide, membrane with fine points in area behind cubitus; Rs moderately long, very slightly sinuate, marginal cells equal. Hind wings short, with prominent points through-

out. Metatibiae with serrate basal carina, 1 outer and 3 inner apical spines.

Male proctiger elongate, slightly roundly produced caudad, apex oblique. Forceps shorter than proctiger; in lateral view stout, sinuate to broad apex, with caudal portion produced as blunt tooth; in caudal view stout, evenly arched, with mesal angle of apex produced as small, blunt, black tooth; in dorsal view almost evenly narrowed to blunt black tips. Female genital segment shorter than rest of abdomen, stout; dorsal valve strongly downcurved to truncate apex; ventral valve nearly as long as dorsal, blunt.

HOLOTYPE, male, allotype, female, numerous paratypes, Mount Ruapehu, November 17, taken from *Dacrydium biforme* at 3,700–4,700 feet. Additional paratypes from the same locality on various dates in November and from Arthur's Pass, February 5, swept from the same host.

HOST PLANT: *Dacrydium biforme* Pilger.

This species shows no very close affinity to any of the other known New Zealand forms.

#### *Trioza adventicia* n. sp.

Fig. 31

Length to tip of folded wings 3.0–3.5 mm.

COLOR: General color of males chocolate brown, with white band of wax on first and last abdominal tergites. Forewings very faintly yellow, transparent, small black spot at anal angle. Females with head and thorax lighter brown.

STRUCTURE: Body surface finely punctate, with long sparse setae. Head as wide as meso-scutum. Vertex with sharp discal impressions, slightly bulging anteriorly. Genal processes short, blunt, divergent, 0.5 as long as vertex. Antennae 1.5 times as long as width of head. Thorax not very strongly arched. Pronotum not depressed below plane of vertex, roundly produced caudad medially. Forewings large, narrowed apically and angular, 3 times as long as wide, membrane without points except in small area at base; Rs short, nearly straight, marginal cells equal. Hind wings short,



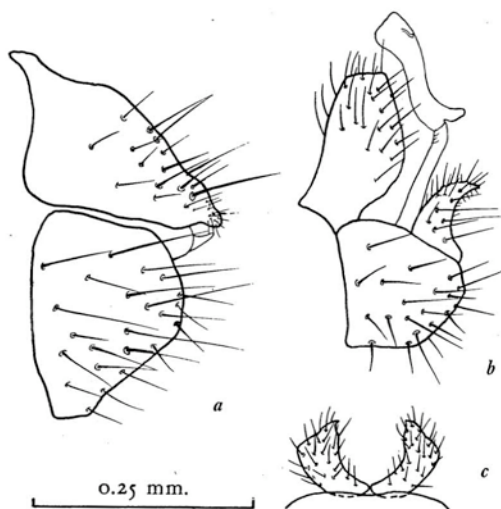


FIG. 31. *Trioza adventicia* n. sp. a, Lateral aspect of female cauda; b, lateral aspect of male cauda; c, caudal aspect of claspers.

scarcely over 0.5 as long as forewing, set throughout with points. Metatibiae with single basal tooth, 1 outer and 2 inner apical spines. Metacoxae slightly raised anteriorly, not spiniform, meracanthi prominent.

Male genitalia small. Proctiger short, broad in lateral view. Forceps very short; in lateral view broad basally, evenly narrowed, apically turned caudad to sharp tip; in caudal view stout, roundly truncate apically to blunt black mesal tooth. Female genital segment short; dorsal valve steep to blunt tip; ventral valve very short, truncate.

HOLOTYPE, male, allotype, female, numerous paratypes, nymphs and eggs taken from plants of *Acmena floribunda* in Nelson, September 19, October 20, and March 7. The feeding of the nymphs on the young leaves causes small pits, rolling of the leaf edges, and discoloration as described by Froggatt in infestations of *T. eugeniae* in Australia (Froggatt, 1901: 284).

HOST PLANT: *Acmena floribunda* D. C. [*Eugenia floribunda*].

This species is apparently an immigrant probably with its host. What its original home may be is problematical. It belongs with the

group of species which Crawford segregated as *Megatrioza*. It resembles *T. curta* (Ferris and Klyver) and *T. eugeniae* Froggatt. It is readily distinguished from both by the presence of only 2 inner apical spines on the metatibiae. I have examined the type specimens of *T. eugeniae* Froggatt and find, as expected, that his statement that there are stout spines on the protibiae is an error; they are on the metatibiae as in other members of the genus, one on the outer and three on the inner margins.

#### *Trioza curta* (Ferris and Klyver)

1932 *Powellia curta* Ferris and Klyver, New Zeal. Inst., Trans. 63: 38, 39, 45, pls. 8, 10.

Specimens of this species were taken in abundance (all stages) from young sprouts of pohutukawa on Rangitoto Island, September 30, 1950. Specimens are also in the Plant Diseases Division Collection, same locality, April 30, 1945, M. W. Carter. It is undoubtedly common throughout the range of its host but seems to be limited to the young, tender foliage as none was found on older leaves although the pits formed by the feeding of the nymphs are common thereon.

In general structure and appearance this and the preceding species are very similar. They fall into the group of species which Crawford segregated as *Megatrioza*, based on a series of characters not one of which will hold for the entire group. Most of the species which have been variously referred to *Megatrioza* undoubtedly constitute a natural group, but I do not feel it is worthy of generic status. It may properly be considered a subgenus.

Additional notes on the species:

Length to tip of folded wings 3 mm.

Head wider than mesoscutum. Pronotum long, not depressed. Membrane of forewings with minute points in small basal area. First abdominal tergite with covering of powdery wax. Metatibiae with 1 outer and 3 inner apical spines. Metacoxae somewhat raised anteriorly, not spiniform.

HOST PLANT: *Metrosideros excelsa* Soland.

# PAUROPSYLLINAE

This subfamily is poorly defined, largely because of the incomplete state of knowledge of the tropical psyllid faunas in which the majority of the species assigned to this group occur.

Ferris and Klyver assigned a species to each of two genera which have been placed here. One of these species, *Pauropsylla meyersi* Ferris and Klyver, appears to be correctly placed in the subfamily although it must be assigned to a distinct genus.

As Ferris and Klyver were apparently unfamiliar with the genus *Gyropsylla* [*Metaphalara*] in which they placed the other species (*Metaphalara zealandica* Ferris and Klyver), there is some doubt as to whether it was properly placed.

## ATMETOCRANIUM new genus

The characteristics which will serve to distinguish this genus from *Pauropsylla* and other known genera are: absence of the coronal suture; covered frons; lack of genal processes; much reduced propleura; metacoxae small, without meracanthi; lack of claws on proximal segment of metatarsi; dichotomously branching veins in the forewing; pterostigma present; only five pairs of abdominal spiracles; valves of female genitalia fused.

GENOTYPE: *Atmetocranium meyersi* (Ferris and Klyver) = *Pauropsylla meyersi* Ferris and Klyver.

*Atmetocranium myersi* (Ferris and Klyver)

1932 *Pauropsylla myersi* Ferris and Klyver, New Zeal. Inst., Trans. 63: 58, pl. 15.

This peculiar species was very completely described and figured by Ferris and Klyver. A series of 11 males and females was taken from kamahi beside the road below Waituhi Trig, November 26, one other specimen was taken the same day several miles nearer Taumarunui. Other specimens were reared from galls on kamahi, taken at Catlins, December 18, 1946, by G. B. Rawlings. This

is a true gall-forming species, the nymphs developing under the bark of twigs of the kamahi. They cause the twig to swell into an elongate gall. Upon maturity the bark ruptures above each insect and the adults emerge. The abandoned galls resemble cicada oviposition injury superficially. G. B. Rawlings first supplied me with this information and some specimens of adults reared from the galls. With his assistance I was able to find the nymphs beneath the growing bark near Rotorua. The kamahi seems to be more heavily infested the further south one goes. Small trees on Stewart Island were deformed as a result of recurrent attacks.

The specimens at hand are somewhat larger than those which Ferris and Klyver had. The present ones range to 3.4 mm. in length to tip of folded wings.

Unfortunately I was unable to determine whether this or a related species occurs on the related tawhero, *Weinmannia sylvicola*.

HOST PLANT: *Weinmannia racemosa* Linn.

That this species is congeneric with *Pauropsylla verticis* Crawford and *P. depressa* Crawford, as was suggested by Ferris and Klyver, is highly doubtful even though these species also lack the coronal suture. This specialization is found in at least one other species, *Levidea lineata* Tuthill, a North American species which shows no other similarity to *Atmetocranium*.

## Genus GYROPSYLLA Brèthes

1921 *Gyropsylla* Brèthes, La Plata Univ. Nac., Facult. Agron., Rev. 14: 87

1925 *Metaphalara* Crawford, Brotéria, Ser. Zool. 22(11): 60.

Three representatives of this genus are known in addition to the New Zealand species which Ferris and Klyver placed here. Of these, one is North American, the others South American. Crawford stated, when erecting the genus *Metaphalara*, that it appeared to be between *Pauropsyllinae* and *Aphalarinae*. Its relationships are still quite unknown.



*Gyropsylla zealandica* (Ferris and Klyver)  
1932 *Metaphalara zealandica* Ferris and Klyver,  
New Zeal. Inst., Trans. 63: 60, pl. 15.

It was very disappointing to be unable to obtain any specimens of this species, even in the type locality. Ferris and Klyver apparently had seen no specimens of the genus and assigned *zealandica* to it with some doubt. As has been indicated in the discussion, if this species is properly placed in this genus, it shows a very definite link to the American fauna.

#### SPONDYLIASPINAE

A single species of a new genus, *Anomalopsylla*, is placed here, principally on the basis of the structure of the metacoxae.

#### ANOMALOPSYLLA new genus

**STRUCTURE:** Head and pronotum strongly deflexed from plane of body. Head wider than mesoscutum. Vertex plane, twice as wide as long, caudal margin straight, medial suture prominent, rounded to genae without suture. Genae not at all produced, not covering frons. Frons visible from below as large triangular sclerite. Antennae of moderate length. Thorax quite flat. Pronotum wide, flat, on same plane as vertex. Propleura equal, covered by mesopleura. Forewings broad, rounded apically, veins strongly raised, membrane vesiculate; media and cubitus with common petiole, cubitus 3-branched, anterior branch not reaching margin, cross vein between  $M_1$  and  $R_s$ , pterostigma present, costa with fracture just before  $R_1$ , costal area from this point to base of wing perpendicular to remainder of wing. Metatibiae without basal armature, with several small black apical spines. Proximal segment of metatarsi with 2 black claws. Metacoxae very weakly developed, without meracanthi, with minute protuberance at base of coxal cavity.

**GENOTYPE:** *Anomalopsylla insignita* n. sp.

The very peculiar species placed here is most closely related to *Tainarys* Brèthes of

any of the genera known to me. It differs from this South American genus principally in the venation of the forewing. Both *Anomalopsylla* and *Tainarys* resemble the principal group of endemic Australian forms in the nature of the metacoxae and are therefore tentatively referred to the subfamily Spondyliaspinae although the degree of relationship is doubtful. It seems quite possible that, when the South American fauna is adequately known, a distinct subfamily may be distinguished which will include these two forms.

#### *Anomalopsylla insignita* n. sp.

Fig. 32

Length to tip of folded wings 1.25–1.60 mm.

**COLOR:** General color cinereous with brown markings, principal ones 2 pairs of dots on vertex, transverse stripe from antennal sockets to median ocellus, 2 pairs of dots on pronotum, broad median vitta on prescutum, 2 on mesoscutum. Abdomen brown dorsally. Forewings semiopaque, membrane faintly brown, with irregular light brown mottling, veins with dark brown spots.

**STRUCTURE:** Body surface finely punctate, shining, with very short, sparse pubescence. Head wider than mesoscutum. Vertex flat, twice as wide as long, with small, shallow discal impressions, posterior margin straight, anterior margin slightly excavate medially, rounded down. Genae not at all produced, not covering frons. Frons visible as distinct triangular sclerite. Clypeus small. Antennae 1.2 times as long as width of head. Eyes globular, projecting, even with posterior margin of vertex. Postocular area small. Thorax quite flat. Pronotum deflexed, but not depressed, wider than mesoscutum, almost as wide as head. Forewings short, strongly tapered in basal third, flaring toward apex, rounded, apex on costal side of center, veins very large and strongly raised, membrane thickened, vesiculate; costal margin fractured just proximad of  $R_1$ , costal margin from this



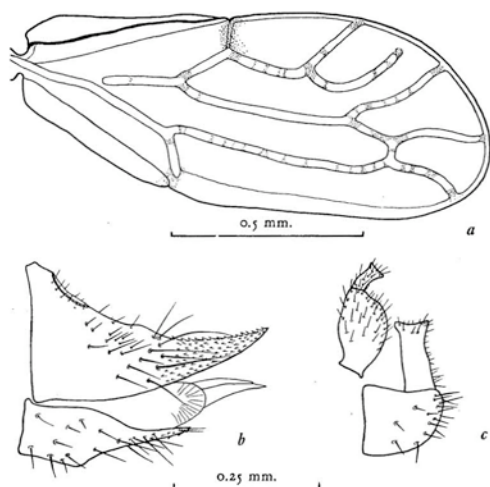


FIG. 32. *Anomalopsylla insignita* n. g., n. sp. *a*, Forewing; *b*, lateral aspect of female cauda; *c*, lateral aspect of male cauda.

point to base broadly bent outward at 90 degrees; long, thickened, pterostigmal area not bounded by distinct vein, Rs long, reaching to near apex, petiole of M and Cu not attached to basal vein, Cu<sub>1</sub> branched, anterior branch not reaching margin, cross vein between Rs and M<sub>1</sub> (an additional cross vein between M<sub>4</sub> and the anomalous branch of Cu<sub>1</sub> is common in the specimens at hand), cubital cell larger than medial. Hind wings well developed. Metatibiae very long, slender, without basal armature, continuous row of 8 black spines on anterior margin of apex.

Male proctiger large, rectangular, with distinct anal segment. Forceps shorter than proctiger; in lateral view straight, nearly parallel-sided to slightly flaring, truncate apex; in caudal view simple, slightly arched to blunt black tips; in dorsal view tip broadly excavate. Female genital segment larger than rest of abdomen; dorsal valve strongly upturned to sharp apex, apical portion thickly set with small retrorse spines; ventral valve shorter than dorsal, acute, with small retrorse spines at apex.

HOLOTYPE, female, allotype, male, numerous adult and nymphal paratypes taken from *Shawia* [*Olearia*] *paniculata*, The Glen, near Nelson, March 7; one female paratype, same locality, January 16.

HOST PLANT: *Shawia paniculata* Forst.

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