

ART. XXXIV.—On a New Species of Psyllidæ.

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[Read before the Philosophical Institute of Canterbury, 26th November,
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Plates XXXIII. and XXXIV.

THE *Psyllidæ* are a family of insects belonging to the order *Homoptera*, and are more closely allied to the *Aphididæ* than to the *Coccidæ*. The only species that have been reported from New Zealand are, as far as I can ascertain, several described by the late Mr. W. M. Maskell in 1889.* Several entomologists of Europe and America have studied this group—namely, Dr. F. Löw, of Germany; Mr. J. Scott, of England; M. V. Shlingerland, of the United States of America; and E. Witslaczil, of Austria.

About the beginning of 1902 a branch of the so-called matipo (*Pittosporum tenuifolium*) covered with numerous scale-insects was sent to me. On examining them I found them to be a species of *Psyllidæ*, which appears to be intermediate between two species described by Mr. Maskell. The following is the specific description:—

***Trioza alexina*, sp. nov.** Plates XXXIII. and XXXIV.

Imago.—Eyes not very prominent, but large; the inner edges form an obtuse angle. The ocelli (Plate XXXIII., fig. 4), consisting of a lens and a quantity of brown pigment, are three in number, one at the angle of each eye and one in the front of the head (Plate XXXIII., fig. 3). The fore wing (Plate XXXIII., fig. 1) is more like that of *Trioza panacis* in venation but that of *Trioza pellucida* in shape, but resembles the typical wing of the genus more closely than either of them.

The primary stalk of the veins (Plate XXXIII., fig. 1, AB) divides directly into three main branches at the point B—viz., (1.) An upper main branch, the stalk of the subcosta (BF), which again divides into two about halfway (F) to the margin. A shorter branch (FG) runs on to the margin, and a longer vein, the radius (FH), runs towards the apex of

* Trans. N.Z. Inst., 1889.

the wing, and reaches the costal vein about seven-eighths of the length of the wings. (2 and 3.) The lower main branches form the upper and lower main branches of the cubitus, which branches directly from the primary stalk at B. The upper main branch of the cubitus divides again at C, but neither branch is a continuation of the main branch. The lower main branch of the cubitus divides at N, a longer and convex branch reaches the margin at K, and a shorter branch reaches the margin at L.

Running from the primary stalk to the lower margin of the wing is an indistinct vein (AM) called the "clavus." In the areas between the branches of the cubitus—namely, DE, EK, KL—are three small triangular markings, composed of very small dots; on the veins of the wing are some very short fine hairs.

The hind wing (Plate XXXIII., fig. 2) is larger in comparison with the fore wing than in either *Trioza panacis* or *Trioza pellucida*. The veins are only marked by rows of large dots, and the whole wing is covered with very small dots. The rostrum is pointed and blackened at the tip, ending in the male with three setæ (Plate XXXIII., fig. 9), which are entirely absent in the female.

Length, about 2.25 mm.

Pupa.—Head generally depressed behind. Eyes large, and of a very dark brown colour. Ocelli three, situated as in the adult. The fringe is very strongly developed, but the individual rods are longer and closer together than in *T. panacis* or *T. pellucida*, and the cups are more or less simply thickenings of the lower portions (Plate XXXIV., fig. 2). The anal ring is ventral, and closely resembles that of *Trioza panacis*.

Length, about 1.75 mm.

Hab. I have found it on *Pittosporum tenuifolium*, where the pupæ lie in little pits both on the ventral and dorsal surfaces of the leaf. Its presence is indicated by the presence of large quantities of a white semi-transparent excretion termed "manna," which fills up the hollows of the leaves, and in windy weather falls to the ground, giving the appearance of a light fall of snow.

Adult Female.—Generally of a light-yellow colour, with a slight green tint which becomes darker during life, probably due to the green food showing through the semi-transparent skin. Head and thorax not so green as the abdomen. Genitalia are of a dark-brown colour, especially at the tips. The length, including genitalia, about 2.25 mm., and expanse of wings 7 mm. At the posterior and ventral surface of the thorax is a short blunt projection (Plate XXXIII., fig. 7, G), found also in the male, but its function seems to be unknown.

The head is broader than long, concave in front and depressed behind. The lower and front portion is prolonged into two conical projections, with numerous hairs. The rostrum is situated on the ventral surface of the thorax, and has a black pointed tip. The female has no setæ on the rostrum. Wings are large and membranous, and arch over and extend beyond the abdomen. Antennæ of ten joints (Plate XXXIII., fig. 8), the third joint being no thicker than the fourth. The first two joints are short, round, and scaly; third joint is longest; last joint is dilated and of a dark colour, with two unequal spines on its extremity. Legs are slender; tibia has numerous small spines on distal end, but in the third pair of legs these are partly replaced by four black conical projections. Tarsus is double-jointed, the second joint having two hooks or spines and a sucker on its distal end. Abdomen has a conspicuous yellow mass (Plate XXXIII., figs. 6, 7), probably corresponding to the pseudovitellus* of the pupa. The anus is situated on the dorsal surface some distance in front of the genital organs. The genitalia are larger in comparison with the abdomen than in *Psylla pyricola*, and are of a dark-brown colour, especially at the tips. Genitalia consist of three plates (Plate XXXIII., fig. 6)—the upper genital plate (A), the lower genital plate (D), and, close to the upper genital plate, a third plate (Plate XXXIII., fig. 6, B) called by Witlaczil the "main rod." Between this and the lower genital plate is a very transparent roundish lobe called the egg-sheath (C).† Viewed sideways the upper genital plate is longer than the lower; all except the egg-sheath are sharply pointed, with numerous hairs scattered about.

Adult Male.—This is very similar to the female, but the rostrum has three setæ, which are entirely absent in the female. The anus (Plate XXXIII., fig. 7, H) is situated on top of the upper genital plate instead of on the abdomen itself, as in the female. Genitalia (Plate XXXIII., fig. 7): The lower genital plate (B) is large and round, and forms the end of the body. It is prolonged upwards to form a pair of claspers (C). The upper genital plate is about as broad as it is long; and, like the remainder of genital organs, stands up almost at right angles from the body. Penis (E) is long and doubled back on itself at D, and provided with a hook at the end. Running through the penis is a duct (K). Having mounted two specimens during copulation, I find the arrangements of the organs are as follows: The claspers of the male grasp the lower plate of the female; the upper plate of the male clasps the upper

* Witlaczil.

† I am a little doubtful about the homologies of the two portions last mentioned.

plate of the female; the penis, which is at other times doubled back on itself, is extended to its full length, and passes in between the "main rod" and the lower plate.

The *pupa* is about 1.75 mm. in length and 1.25 mm. in breadth, not counting the fringe. The head and thorax are more or less fused together; abdomen well marked and round. The pupa is almost stationary, but sometimes moves about slowly, especially when food is scarce. General colour is a light-yellow. Eyes large, faceted, but not prominent (Plate XXXIV., fig. 1). Ocelli, three. Legs are thick and broad, the distal end provided with a sucker, two hooks, and a spine. Rostrum (Plate XXXIV., fig. 5) is rounded at base and conical at the top, which is of a dark colour. A long seta runs from the tip backwards, and divides into two; this runs forwards and forms a complicated system of setæ, which appear to vary very much in different specimens. The anal ring is on the ventral surface; and, as I have seen in several of my specimens a small anal ring forming inside the old one, it seems as if new ones are formed as the animal increases in size.

The greater part of the white excretion found with the insects is excreted by the pupa through the anal ring, but small masses are also excreted by the imago. It appears to be a semi-transparent bag full of a transparent fluid which hardens when exposed to the air.

The whole body of the pupa is covered with a transparent shield, in appearance very much like a very small tortoise-shell. On the outer edge is a thick fringe of fine, long, transparent threads, very much like fine glass tubing. The fringe appears to stick to the leaf, and so hold the pupa in its place. The whole animal, with its fringe, can be hardly seen with a naked eye when on the leaf, but under the microscope it presents a very beautiful appearance.

Under the shield the wings can be seen forming, and when ready the imago ruptures the shield and emerges as the adult insect, except that the wings are still folded. Some entomologists state that the pupa changes its shape as it grows. With the exception of the wings forming and the general size increasing, I have seen no changes, though I had several batches of live insects and pupæ under a glass bell jar. I have been unable to find either the eggs or the larvæ.

EXPLANATION OF PLATES XXXIII. AND XXXIV.

Trisoa alevina, sp. nov.

PLATE XXXIII.

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| <p>Fig. 1. Fore wing of adult insect—
 AB. Primary stalk.
 BF. Stalk of subcosta.
 FH. Radius.
 BC. Main upper stalk of cubitus.
 BN. Main lower stalk of cubitus.
 CD, CE. Secondary branches of BC.
 NK, NL. Secondary branches of BN.
 HM. Clavus.
 Fig. 2. Hind wing of adult insect.
 Fig. 3. Head of adult insect—
 O. Ocelli.
 A. Anterior projections.
 Fig. 4. Ocellus of adult insect—
 A. Lens.
 B. Pigment.</p> | <p>Fig. 5. Hind leg of adult insect—
 A. Conical projection.
 B. Hooks and sucker.
 Fig. 6. Abdomen of female—
 A. Upper genital plate.
 D. Lower genital plate.
 C. Egg-sheath.
 B. "Main rod."
 E. Anus.
 Fig. 7. Abdomen of male insect—
 A. Upper genital plate.
 B. Lower genital plate.
 C. Claspers of B.
 E. Penis.
 D. Hinge of penis.
 K. Duct running through penis.
 H. Anus on upper genital plate.
 G. Spur.
 Fig. 8. Antenna of adult insect.
 Fig. 9. Rostrum of adult male.</p> |
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PLATE XXXIV.

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| <p>Fig. 1. Pupa—
 A. Fringe.
 B. Wing-covers.
 C. Rudimentary wings.
 D. Pseudovitellus glands.
 O. Ocelli.</p> | <p>Fig. 2. Fringe (much enlarged)—
 A. Cups.
 Fig. 3. Leg of pupa.
 Fig. 4. Anal ring of pupa.
 Fig. 5. Rostrum of pupa, showing one of the many arrangements of the setæ.</p> |
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All drawings greatly enlarged.

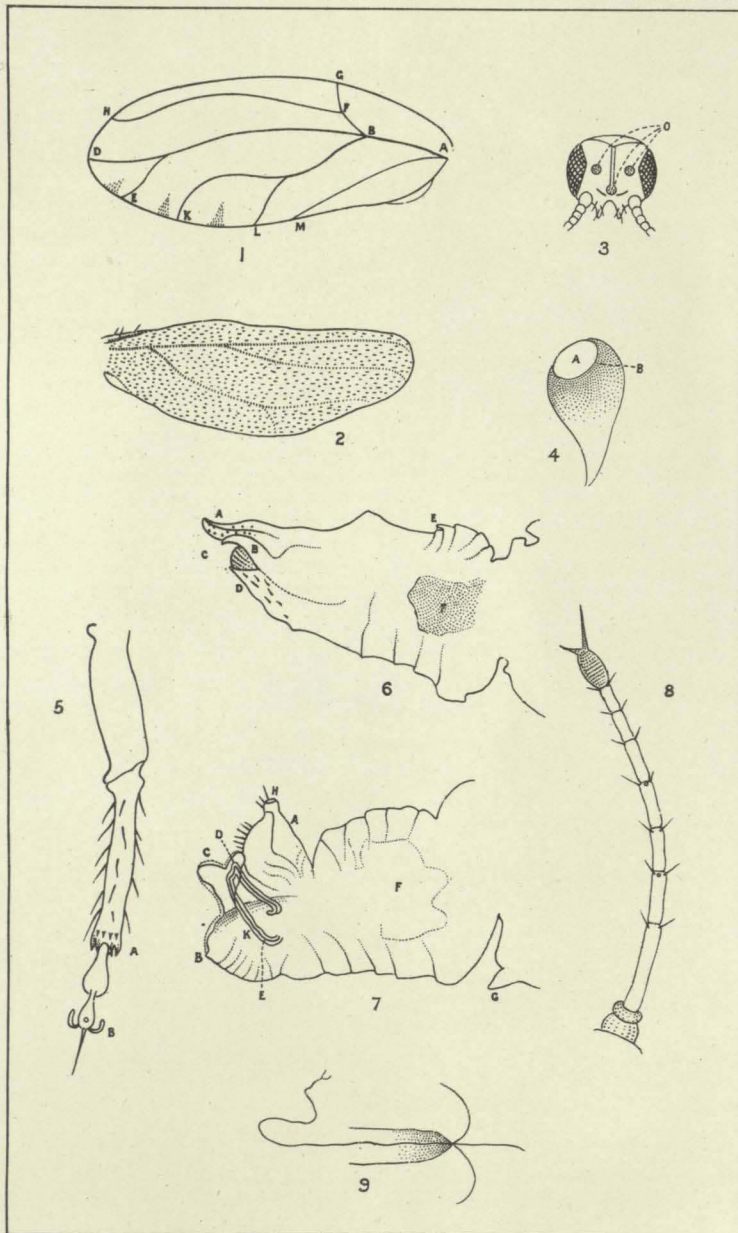
ART. XXXV.—Notes on the Whitebait of New Zealand.

By A. J. MACKENZIE, Curator, Kanieri Lake Fish-hatchery, Westland.

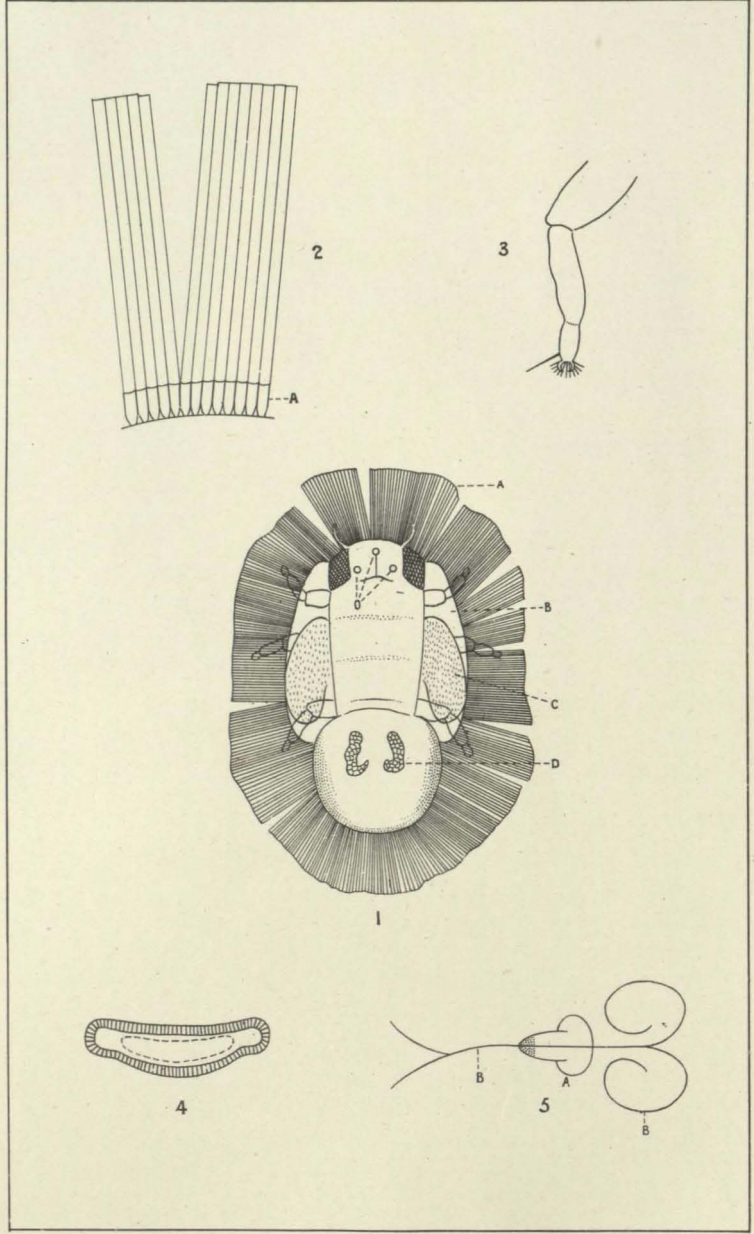
Communicated by Sir J. Hector.

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I HAVE seen a notice in the *Otago Witness* of a paper read at a meeting in Wellington about New Zealand whitebait, the writer contending that whitebait were the young (or fry) of *Galaxias attenuatus*. This is a question I have been taking a considerable interest in for some time, and as I have been experimenting with whitebait at the hatchery the following may prove of interest, and assist to solve the question of what



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