

A GYNANDROMORPH CICADA

J. S. DUGDALE,
N.Z. Forest Service, Whakarewarewa,
and
C. A. FLEMING,
N.Z. Geological Survey, Lower Hutt.

During the 1965-66 summer one of the writers (C.A.F.) obtained numbers of cicadas from throughout New Zealand, collected by students and friends in response to a request for material. A specimen collected by Mr. J. Braggins, Victory University of Wellington, was found when set to combine the characters of male and female; it is the only gynandromorph recognised among some 3,000 specimens examined during the past three years. The specimen has been deposited in the Dominion Museum, Wellington.

The intersex is a specimen of the South Island montane tussock cicada described as *Melampsalta muta pallida* by Hudson (1950, *Fragments of New Zealand Entomology*, p. 139; pl. 15; figs. 3, 4). As illustrated by Hudson, this form shows strong sexual dimorphism in colour pattern, the male being strongly pigmented, the female rather weakly so.

In general appearance (Fig. 1) the gynandromorph resembles a female in its restricted dark markings and ochraceous general colouration, but its abdomen is short and stout, like that of a male. The pattern of pigmentation of head, pronotum and mesonotum is essentially that of a normal female (Fig. 5). In particular, head and pronotum have very limited areas of dark pigment. On the mesonotum the basic pattern of four dark triangles (common to all the *muta* group) is represented in females of *pallida* by two inner black triangles and two outer triangles of paler tint, chestnut in the gynandromorph (shown stippled in Fig. 1).

The abdominal tergites are irregularly and asymmetrically marked by black areas on either side of the mid-dorsal silver pubescent stripe. The black areas are larger than in any normal female examined (cf. Fig. 5), but are not sufficiently developed to resemble a male (Fig 2) except on the left side of the sixth and seventh tergite, which are entirely dark.

Ventrally (Fig 4) the gynandromorph resembles females in the general lack of black pigment, particularly on the second abdominal sternite, immediately behind the opercula, which is strikingly jet black in normal males (Fig. 3), but bears only a few irregular black marks in the abnormal specimen. The limbs resemble a normal female's.

The sound organs resemble those of a female, except that the left operculum is intermediate in development between the normal female and male conditions, having an irregular caudad extension, much less extensive than the operculum of a male (Fig. 3).

Melampsalta muta pallida Hudson

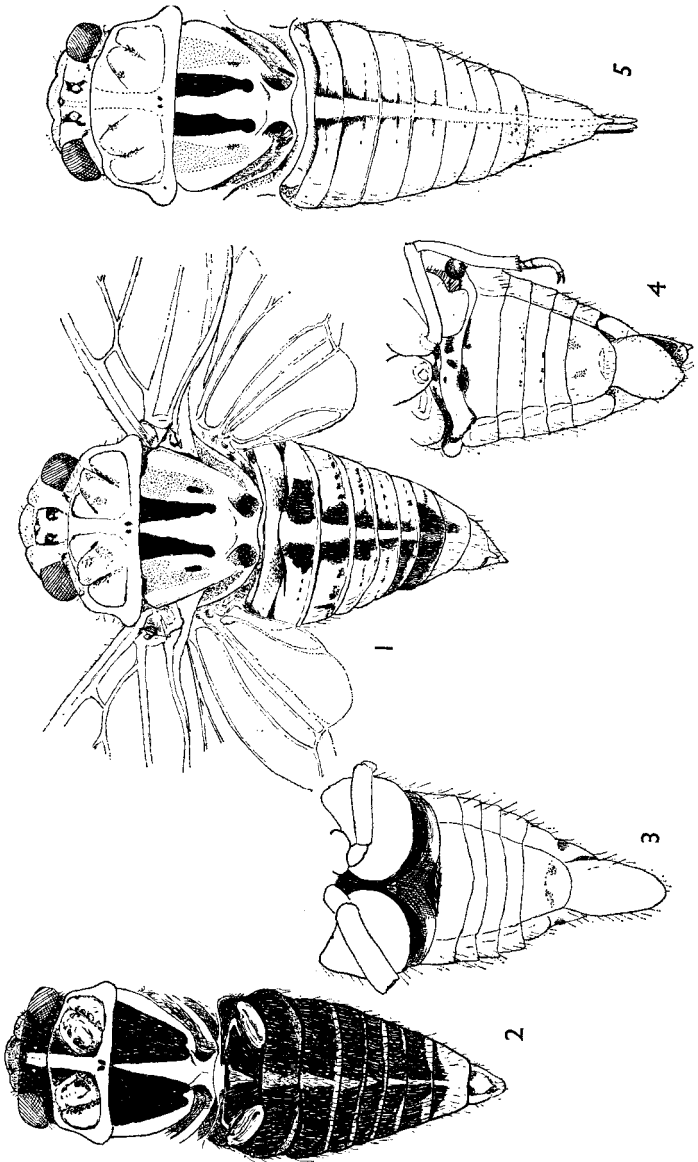


Fig. 1. Gynandromorph, L. Wakatipu, 10 February, 1966. Coll. J. Braggins. (Dominion Museum).

Fig. 2. Male, showing normal pigmentation, Porter's Pass, 26 January, 1966. (C.A.F.).

Fig. 3. Male, ventral view, showing opercula.

Fig. 4. Gynandromorph, ventral view, showing asymmetry of opercula.

Fig. 5. Female, showing normal pigmentation. Porter's Pass, 26 January, 1966. (C.A.F.).

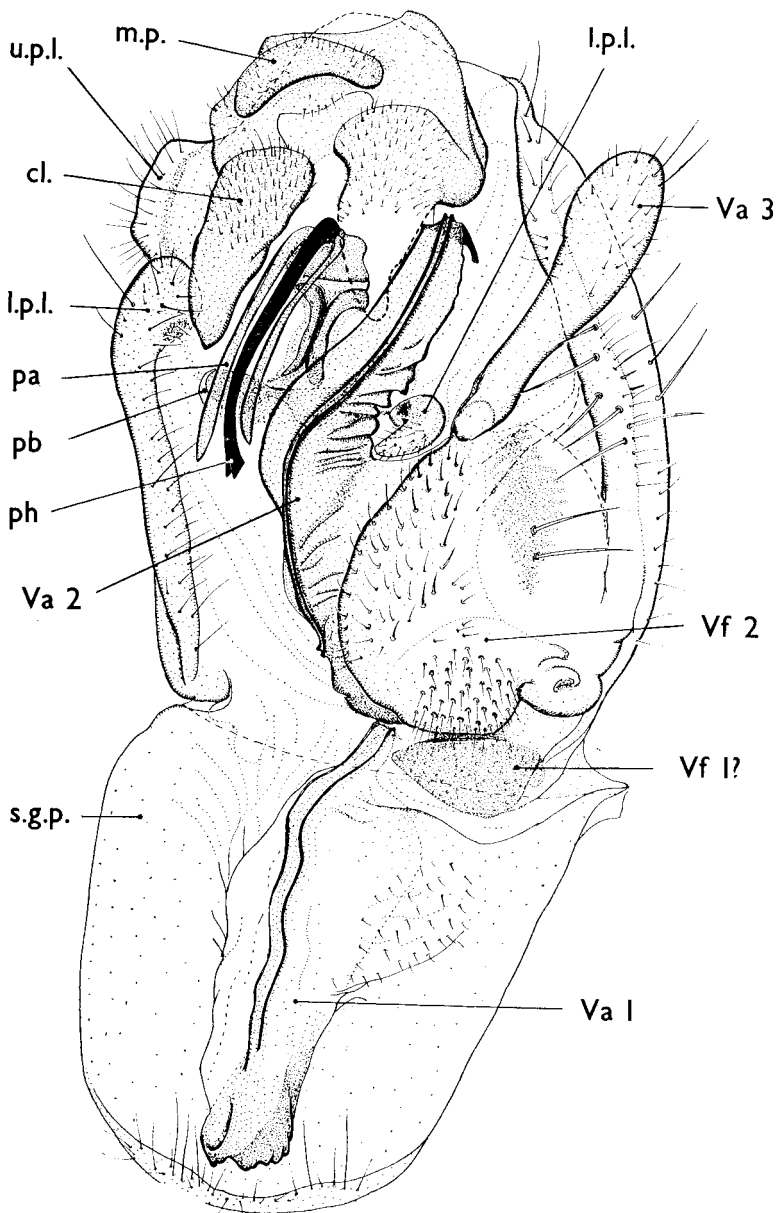


Fig. 6. Gynandromorph. Pygofer in caudal aspect. Abbreviations in text.

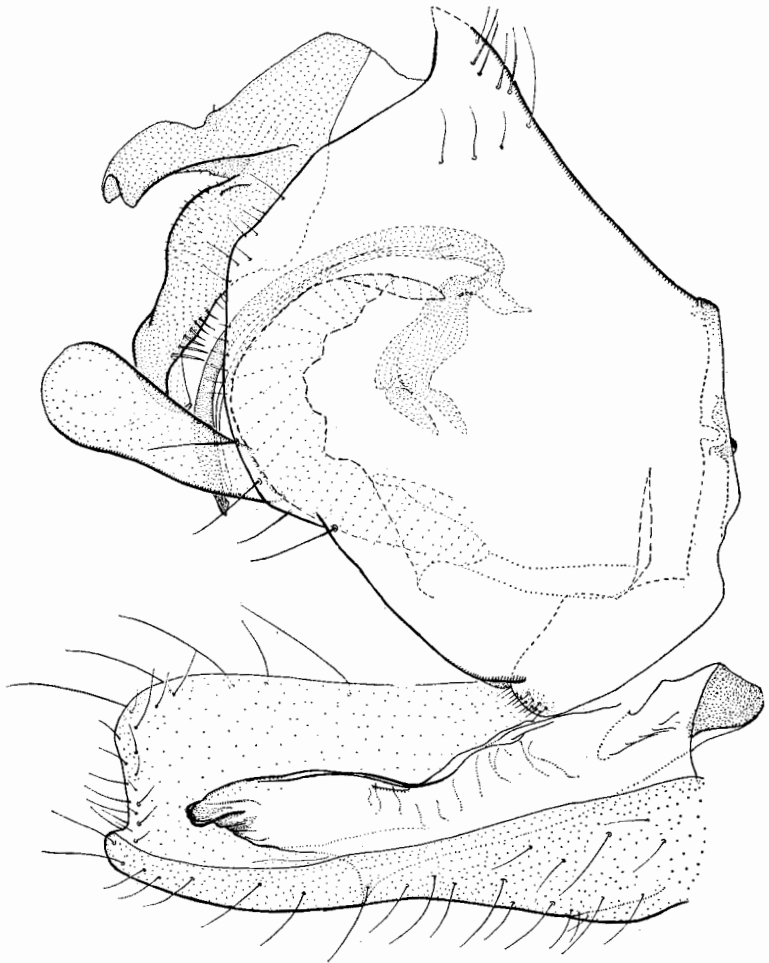


Fig. 7. Gynandromorph. Pygofer in right profile.

The terminal abdominal segments, somewhat twisted to the left, superficially resemble those of a male, but the individual sclerites are somewhat irregular and mis-shapen. The seventh sternite is normal in shape. The subgenital plate is shorter than that of normal mlaes. The pygofer is also short and is twisted asymmetrically.

The gynandromorphy of the pygofer and its associated structures is diagonal, with the left and dorsal region male, and the right and ventral region female (Fig. 6). Genital structures are crowded and twist past each other. The male gonopore only is recognisable;

ovipore and copulatory pore are absent. The phallus lacks an ejaculatory duct, and no evidence of ovaries was seen on dissection. The specimen is therefore presumed to be sterile.

The male structures present are (Fig. 6): the median process (m.p.) twisted to the right, and carrying with it the claspers (cl.); the upper pygofer lobe (u.p.l.) on the left side only; the lower pygofer lobe (l.p.l.) normal on the left side, present as a minute finger-like process to the side of the abortive 2nd valvula on the right; the phallus (ph) with parameres (pa) and phallobase (pb), smaller than in normal males, and twisted to the left. The subgenital plate (s.g.p.) is broader and shorter than normal (cf. Figs. 3, 4.).

The female structures present are: the unlobed, coarse-bristled posterior pygofer margin; the right 1st valvula (Va 1) on the male subgenital plate; a dark sclerite at the base of the subgenital plate which may represent the 1st valvifer (Vf 1); the fused left and 2nd valvula (Va 2), grossly shortened, twisted and lacking apical structures (cf. Fig. 8); the right 2nd valvifer (Vf 2) with its characteristic oval patch of proprioceptor setae; the club-like right valvula (Va 3), slightly broader apically than normal.

The pygofer, even in right profile, is predominantly male (cf. Figs. 7, 8). This, coupled with the well-formed subgenital plate and the rudimentary right lower pygofer lobe indicates a tendency towards mosaic gynandromorphy with the male influence dominant, in contrast to the rest of the body, where the female influence predominates, although, as in the genitalia, the left side bears weakly male characters. "Maleness" in this specimen becomes more evident posteriorly, culminating in the relatively well-formed phallus.

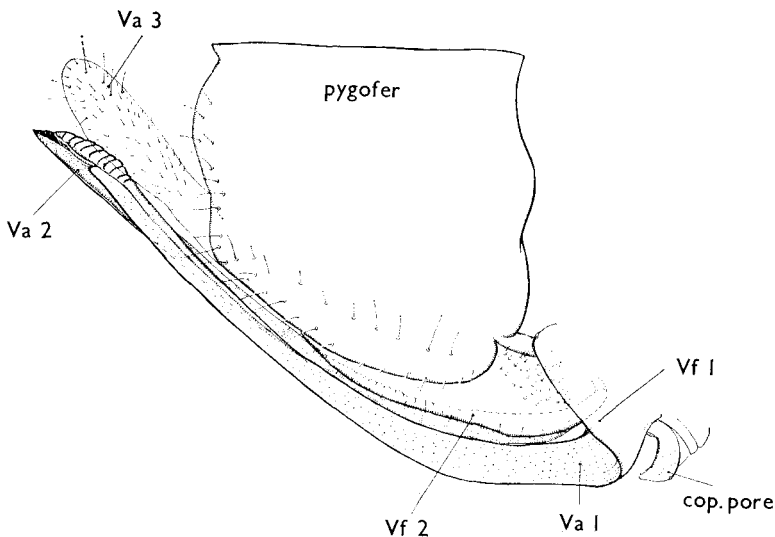


Fig. 8. *M. m. pallida*, ♀, Lake Sedgemere, 13 February, 1966
J.S.D. (Cop. p. — Copulatory pore).