A Record of Sound Produced by the Larvae of *Tetrorea cilipes* White (Coleoptera: Cerambycidae)

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Night collecting was being carried out in native bush at Greenhills near Bluff on January 18, 1959, when a pronounced clicking noise was heard. It was a warm moonlight night with intermittent moderately strong gusts of wind and calm periods. The time was about 12.30 a.m. The particular area had been passed earlier that evening, when no noise was heard, although on that occasion it could have been undetected due to the squally conditions.

The sound was a very regular clacking noise similar to that produced intermittently by our large cicada, *Melampsalta cingulata* Fabricius, although not as loud. The source was traced to a recently killed putaputaweta tree or marble leaf, *Carpodetus serratus* Forst. about twenty yards distant. This tree was lying horizontally, resting on its upper branches, with dry leaves still attached to the twigs. There were no insects visible and the noises were found to be coming from within the branches. One sound was traced to a particular branch, a section of which was removed for further study.

Sound seemed to emanate from between 25 and 50 different sources in the tree, although an accurate count was impossible. The main concentration was in the smaller branches of 1–3 inches diameter. Response to outside disturbance such as sound or vibration was immediate, any movement causing an abrupt cessation of clicking. After a quiet period of perhaps up to a minute the clicking sounds would recommence, firstly from a single source. If at this stage there was no support from others, due to some local disturbance factor, the initial source would also become silent.

On returning to Nelson a fortnight later and by isolating the various insects found within the sample, it was discovered that the noise was caused by cerambycid larvae. These were determined as *Tetrorea cilipes* White, by using Dumbleton's keys (1957) and later confirmed by the rearing of adults. From the sample section which was $1\frac{3}{4}$ inches in average diameter and 18 inches long a total of 4 adults, 3 pupae and 7 larvae was obtained.

Other insects in the sample were *Aphocoelis versicolor* Broun, *Psepholax simplex* Pascoe, and *Stephanorhynchus curvipes* White. Many specimens of *Paranomocerus spiculus* Redtenbacher were found in pupation cells in the wood immediately below the bark

layer, and under the bark itself were *Eiratus suavis* Broun and numerous specimens of *Dendrotrupes vestitus* Broun.

Under laboratory conditions the duration of the clicking sounds was markedly different from that noticed in the field. The periods of activity lasted for only a minute or much less at a time, whereas in the natural habitat sound production was continuous unless the insects were disturbed. It is probable that insufficient larvae were present in the sample to provide the group stimulus apparently necessary for the continuous production of sound.

For a week the sample was kept under as constant observation as posible and during that period sounds were heard between darkness and midnight on four occasions, 17 times during the midnight to dawn period and three times during daylight. A tape recording was made of typical clicking sounds.

The method of sound production was not positively determined, although it seems unlikely that it is made by any structural mechanism in or on the insect itself. It was found that the larvae were just beneath the thin layer of bark when making the noise. On one occasion the bark was seen to pulsate simultaneously with sound production, as though a larva had grasped a fragment on the underside with its mandibles, and the sound occurred when this was torn free. The localised area of bark would thus act as a tympanum and amplify the sound. On removing all the bark only scarcely audible clicking sounds were heard from within the wood. Crawshay (1907) states that clicking sounds similar to those described are produced by the larvae of *Tetropium gabrieli* Weise, European cerambycid, "For some time prior to, and especially during the excavation of the pupa—cavities in the bark." This seems a feasible explanation for the behaviour of *Tetrorea cilipes* larvae. Sound would depend not only on the presence of the insects, but also on the type and condition of the bark of the host tree. A prolonged soaking by rain possibly could soften the bark to such an extent as to completely prevent sound production. Prior to collecting material at Greenhills, there had been a long dry priod. In America, Chittenden (1896) has noted clicking sounds associated with the larvae of *Leiopus cinereus* LeConte and also with the pupae of *Leptostylus biurstus* LeConte, both of which are cerambycids.

This appears to be the first record of sound produced by the immature stages of the New Zealand Cerambycidae, although many adults of this family are well known as being capable of loud stridulation.

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