

ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: COLEOPTERA: ANTHRIBIDAE

By **Beverley A. Holloway**¹

Abstract: Two species of Anthribidae occur on the New Zealand Subantarctic Islands, *Cacephatus aucklandicus* (Brookes) on the Auckland Islands and Snares and *Lichenobius littoralis* Holloway on the Snares. Both are found also on the southern mainland of New Zealand. The species are redescribed and illustrated.

INTRODUCTION

Anthribidae were unknown from the Subantarctic Islands until 1951 when a new species was recorded from a single specimen collected on the Auckland Islands in 1943 by Dr R. A. Falla. The species was described as *Anthribus aucklandicus* by Brookes (1951) who considered it to have no close relatives on the mainland of New Zealand and indicated that his placing of it in the genus *Anthribus* was provisional until further specimens became available for study. On more recent visits to the Auckland Islands, E. S. Gourlay and Drs J. L. Gressitt and G. Kuschel collected adults of the same species as well as immature stages from some of which adults were reared. In 1967, P. M. Johns collected *aucklandicus* on the Snares, and in the following year Dr Kuschel found that it occurred on Stewart Island. Although a careful search has been made for *aucklandicus* on Campbell Island, no specimens have been found and it can be fairly safely assumed that its range does not extend south of the Auckland Islands. A study of both sexes of *aucklandicus* has revealed that it belongs to the genus *Cacephatus* Blackburn which has representatives on the Chatham Islands, New Zealand, Australia, Lord Howe Island, Norfolk Island and New Caledonia, and that it is most closely related to the species occurring on the Chathams. *Cacephatus* is unique among New Zealand Anthribidae in having wood-boring rather than bark-boring larvae.

The only other Subantarctic anthribid is *Lichenobius littoralis* Holloway which was described in 1970 from specimens collected on the Snares in 1967 and in the Stewart Island area in 1968 and 1969. This species is particularly interesting because, unlike most Anthribidae which are forest dwellers, it lives in crustose lichens of the supralittoral zone (Holloway 1970). A second species of *Lichenobius* occurs on the Chathams.

The family is best developed in tropical and subtropical climates and it is therefore exceptional that New Zealand has the relatively high number of 45 or so endemic species. Of these about one-third are flightless. The Subantarctic species comprise merely the southernmost extension of the New Zealand fauna. Both Subantarctic species, although not at all interrelated, have undergone a striking evolution resulting in the loss of the antebasal carina of the pronotum, a phenomenon which is virtually unknown in the family. The presence of these two flightless species on the islands may be easily explained as one is strictly supralittoral and the other has larvae which are xylophagous and could have been transported in drifting wood.

I am indebted to Dr J. L. Gressitt, Bishop Museum, Honolulu, P. M. Johns, University of Canterbury, Christchurch and R. G. Ordish, Dominion Museum, Wellington for the loan of specimens, to B. E. Eykel, Entomology Division, Nelson for preparing the habitat photographs and

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TAXONOMY

KEY TO SPECIES

- Larger, 4.5–6.4 mm. Vestiture fawn. Elytra mucronate. On trees and shrubs. Auckland, Snares,
 Stewart I.....***Cacephatus sucklandicus***
 Smaller, 1.7–2.1 mm. Vestiture greyish white. Elytra not mucronate. On supralittoral lichens. Snares,
 Stewart I.....***Lichenobius littoralis***

***Cacephatus* Blackburn, 1900**

Blackburn, 1900, *Trans. R. Soc. S. Austral.* **24**: 143, 151.

Eyes somewhat elongate, moderately convex, with anterior margin truncate or barely emarginate, with short hairs between ommatidia. Rostrum parallel, transverse or slightly elongate, anterior margin behind labrum truncate or weakly emarginate. Labrum bare on dorsal surface except for 1 or 2 pairs of proclinate setae, with a fringe of hairs on distal margin. Mandibles with an acute or obtuse tooth on inner edge. Scrobes foveiform, open below, entirely concealed in dorsal aspect. Antennae inserted latero-ventrally near middle, their length usually similar in both sexes, reaching beyond base but not beyond apex of elytra.

Prothorax wider than long, widest within basal third. Carina subbasal or antebasal, its dorsal portion usually high, sharp, rimulose, the marginal portion always present, short; dorsal surface finely punctate, without pits, callosities, and tufts. Scutellum distinct.

Elytra parallel or elliptic, with or without humeral callus; base moderately proclinate, truncate, with marginal rim accentuated by distinct groove behind, this groove occasionally extended across humeral area and merging with stria 10; striae distinct; striae fine; pits, callosities, and tufts absent; females usually with transverse dark band near middle.

Wings usually fully developed, rarely atrophied.

Pygidium similar in both sexes, with distinct transverse carina under tip of elytra.

♂. Tergite 8 with apex barely to markedly emarginate, sometimes with weak median lobe. Sternite 8 truncate or emarginate; apodeme vestigial, with or without arms. Sternite 9 with well developed arms. Tegmen with body longer than apodeme; fused parameres upcurved, with apex rounded, truncate or emarginate in dorsal aspect, not dilated at tip in lateral aspect, with a single tuft or 2 tufts of hairs; apodeme narrow or broad. Aedeagus with pedon undivided, its apex pointed or blunt; apodemes continuous with pedon, their bridge variable in position. Internal sac usually extending as far as or beyond apodemes, rarely shorter; with fine armature on the ventral wall and with a variably developed darker, somewhat cordiform patch on dorsal wall. Insertion of ejaculatory duct dorsal cephalad from dorsal diverticulum.

♀. Tergite 8 without lobes. Sternite 8 without lobes, with sclerotized arms not greatly divergent, hairs not confined to margin. Hemisternites with long teeth; lateral rods distinctly demarcated from body; median rods not reaching to apex of lateral rods, fused throughout their length, widening distally, the distal end broadly emarginate. Stylus small. Vulva enclosed by a median dorsal membranous lobe and a pair of membranous lobes on ventral surface. Bursa copulatrix without sclerites. Spermatheca not annulate; spermathecal duct and gland entering spermatheca through common atrium; spermathecal duct insertion on bursa copulatrix in invagination at base of median oviduct.

Type-species: *Cacephatus sericeus* Blackburn.

Distribution. Australia, New Caledonia, Norfolk, Lord Howe, New Zealand.

Remarks. This genus has no close relatives in New Zealand and seems to be the only one

with wood-boring larvae in the country. It is widely distributed on the New Zealand mainland and on the Chatham Islands as well as on the Snares and Auckland Islands. The 5 valid species of *Cacephatus* occurring in New Zealand are:

<i>aucklandicus</i>	(Brookes, 1951)	n. comb. (<i>Anthribus</i>)
<i>huttoni</i>	(Sharp, 1876)	n. comb. (<i>Brachytarsus</i>)
<i>incertus</i>	(White, 1846)	n. comb. "
<i>inornatus</i>	(Sharp, 1876)	n. comb. "
<i>propinquus</i>	(Broun, 1911)	n. comb. "

Cacephatus was known only from Australia, but in addition to the New Zealand representatives and the type-species *C. sericeus* Blackburn I, have seen others from New Caledonia, Norfolk and Lord Howe.

Cacephatus aucklandicus (Brookes, 1951) n. comb. (*Anthribus*) Fig. 1-4, 9-17.

Brookes, 1951, *Cape Exp. Ser. Bull.* 5: 43, fig. 10 (*Anthribus*).

Derm shiny piceous or fuscous, antennae and legs castaneous. Vestiture decumbent, dense, fawn, with irregularly scattered smaller and larger brown markings; dark band across elytra of female weakly indicated.

Head and frons irregularly striolate, densely clothed; ocular distance on frons 0.78 the width of rostrum. Rostrum 1.23-1.28 \times wider than long (length from base of labrum to anterior margin of eyes), striolate, densely covered, with broad apical impression and with distinct median groove usually extending to frontal fovea, with or without fine carina in bottom of groove. Antennae as in fig. 2; segment 2 of funicle as long as or very slightly longer than 3, hairs of all segments of funicle appressed or nearly so except for a loose crown of setae at end of each segment.

Prothorax 1.26-1.34 \times wider than long, evenly convex, truncate at base, widest at proximal 1/3, converging distad in gentle arch. Antebasal carina strongly reduced, the portion on the lateral margin always present, but the dorsal portion absent (Auckland Islands, Snares, Stewart I) or partially present (only Stewart I).

Elytra 1.24-1.35 \times wider than prothorax and 1.48-1.55 \times longer than their own width, elliptic, widest near middle; humeral area without callus, strongly oblique; each elytron with a tufted blunt apical mucro which is distinctly longer on specimens from the Snares and Auckland Islands than on those from Stewart I; longitudinal convexity even from base to apex; intrahumeral callus absent or extremely weak; basal margin with sharp rim which has a deep groove continued laterad over the humeral area and merging into stria 10, the rim remaining distinct and sharp across the humeral area.

Wings as in fig. 4, strongly atrophied, wing/elytra ratio 0.40-0.45.

Entire ventral surface finely punctate. Ventrites 1-3(4) with median carina in males, with weaker carina or without carina in females.

Appendix of claw truncate.

♂. Segment 8 as in Fig. 14, tergite distinctly emarginate, sternite sinuously truncate, not emarginate, with baculiform apodeme; sternite 9 as in fig. 14. Tegmen as in fig. 12, 13, apodeme broad, parameres deeply emarginate. Aedeagus as in fig. 9-11, pedon blunt at tip; apodemal bridge distant from body. Internal sac short, patch of armature at dorsal wall small, cordiform.

♀. Segment 8 as in fig. 17, sternal arms strongly widening distally, hairs confined to marginal area. Genitalia as in fig. 15, 16, teeth and stylus moderately hairy.

Length: 4.5-6.4 mm, width 2.10-2.95.

AUCKLANDS. Auckland I: Ranui Cove, 7-12.XI.1954, 2 specimens, E. S. Gourlay; Port Ross, 1943, 1 (holotype), R. A. Falla. Enderby I: Sandy Bay, 17.III.1954, 1 specimen, R. K. Dell. Ewing I: XII. 1962 and I. 1963, 14 on *Olearia lyallii*, Gressitt, Johns. Rose I: 11.I.1963, 1 on *Poa litorosa* at night, Johns. French I: 2. I. 1963, 1 on *Hebe elliptica*, Gressitt. Adams I: Magnetic Station Cove, 29.I.1966, 1 in pupal chamber ex *Myrsine divaricata*, 1 ex *Pseudopanax simplex*, Kuschel; Fairchild's Garden, 20.I.1966, 4 ex *Hebe elliptica*, 2 reared, these emerging 5.II.1966 and 24.VI.1966, Kuschel.

SNARES. Station Point, I. and II. 1967, 10 on *Olearia lyallii*, Johns.

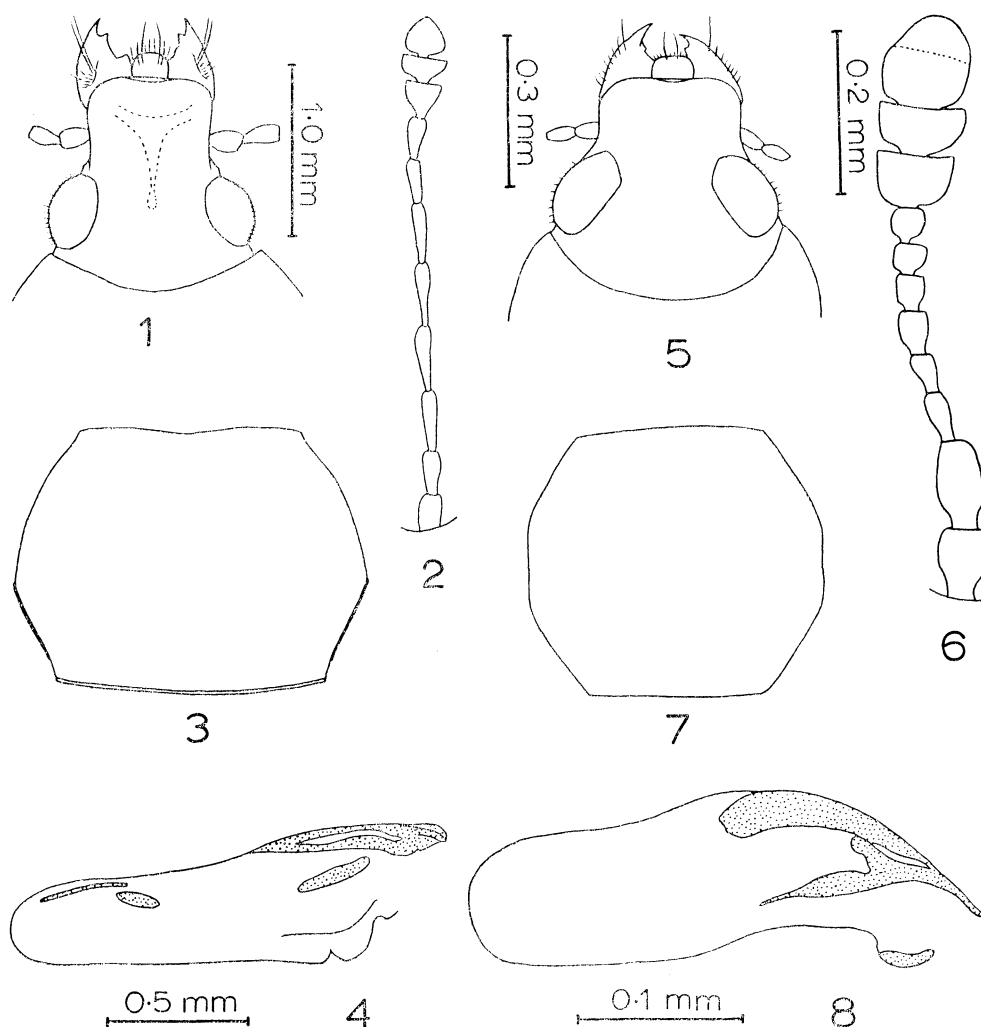


Fig. 1-8. *Cacephatus aucklandicus* (Brookes), ♀, French I, Auckland Is: 1, head; 2, antenna; 3, pronotum; 4, wing. *Lichenobius littoralis* Holloway, ♀: 5, head (Snares); 6, antenna (Big South Cape I); 7, pronotum (Snares); 8, wing (Big South Cape I). Fig. 6 & 8 from Holloway (1970). Fig. 1-3 same scale; fig. 5, 7 same scale.

STEWART I: Stewart I: Rakeahua Valley, 5 reared ex dead wood of *Dacrydium cupressinum* collected 22.II.1968, emerging V. 1968, L. J. Dumbleton. Big South Cape I: Puwai, 24-28.VIII. 1964, 8 on *Olearia grandis*, Johns; NE end to SW end, XI. 1968 and II. 1969, 47 on *Olearia grandis*, *Hebe elliptica*, 2 reared ex dead stems of *Coprosma lucida*, Ent. Div. Exp. Big Stage I: 31.VIII.1964, 6 on *Olearia grandis*, B. D. Bell.

Holotype ♂, 5.4 × 2.4 mm, Port Ross, Auckland Is, 1943, R. A. Falla, Dominion Museum, Wellington.

Ecology and bionomics. This species occurs in the bushy coastal lowlands of the Aucklands and

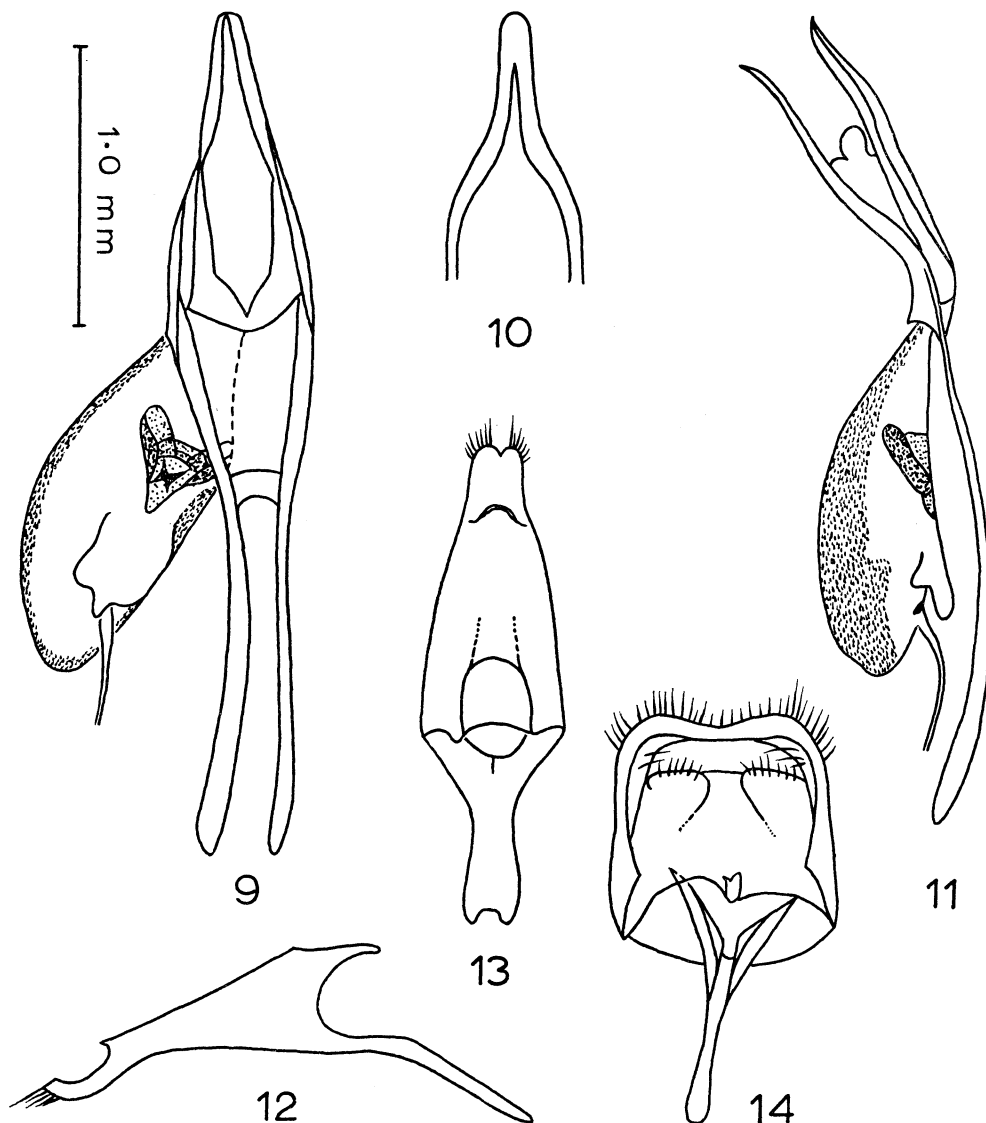


Fig. 9-14. *Cacephatus aucklandicus* (Brookes), ♂, Ewing I, Auckland Is: 9, aedeagus, dorsal; 10, apex of pedon; 11, aedeagus, lateral; 12, tegmen, lateral; 13, tegmen, dorsal; 14, segment 8 and sternite 9, ventral. All fig. same scale.

Snares where it has been beaten or extracted or reared from dead branches and stems of *Olearia lyallii* (Compositae), *Hebe elliptica* (Scrophulariaceae), *Myrsine divaricata* (Myrsinaceae), and *Pseudopanax simplex* (Araliaceae). Specimens from Stewart I were reared also from *Olearia grandis* (Compositae), *Coprosma lucida* (Rubiaceae) and *Dacrydium cupressinum* (Podocarpaceae). The larvae are true wood borers and attack dead but sound or slightly decaying wood.

Remarks. *C. aucklandicus* is closely related to *C. propinquus* (Broun) from the Chathams. Both

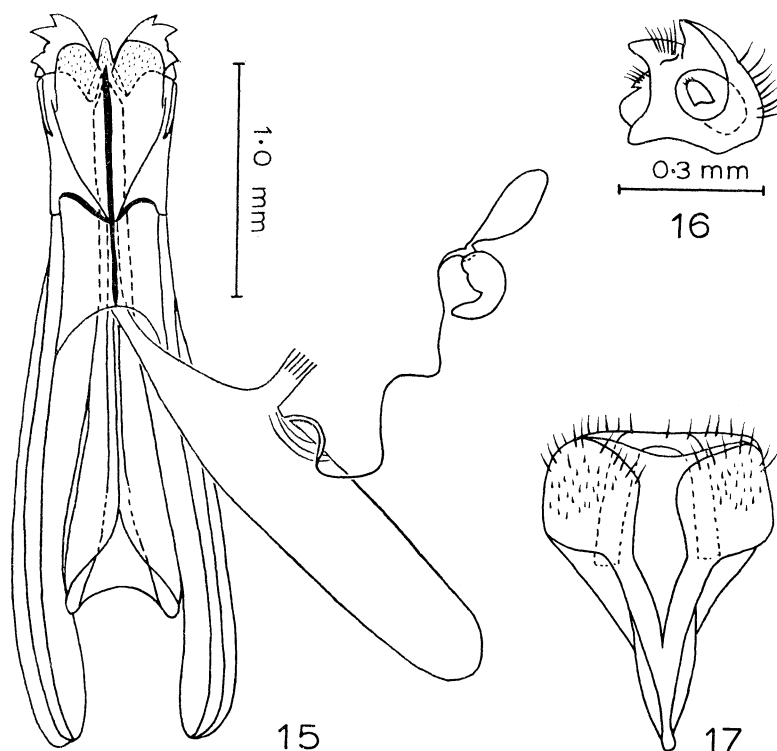


Fig. 15–17. *Cacephatus aucklandicus* (Brookes), ♀, French I, Auckland Is: 15, genitalia, ventral; 16, toothed part of hemisternite, lateral; 17, segment 8, ventral. Fig. 15, 17 same scale.

species are flightless and have in common such unusual characters for the genus as mucronate elytra and truncate appendices of the claws. The two species differ markedly in the degree of development of the antebasal carina, in the proportions of the body, in the vestiture of the body and pilosity of the antennae. The degree of reduction of the wings is the same in these two species, but the sharp basal rim of the elytra is very weak across the humeral area in the Chatham I species.

The populations of *C. aucklandicus* from Stewart I have a weakly developed elytral mucro compared with the strong mucro on the Auckland Is specimens, but those from the Snares are intermediate. The dorsal portion of the antebasal carina is absent in all specimens so far collected on the Aucklands and Snares while present in varying degrees in slightly more than half the specimens from the Stewart I area.

Lichenobius Holloway, 1970

Holloway, 1970, *N.Z. J. Sci.* **13**: 438.

Eyes transverse, lateral, protruding, weakly emarginate, coarsely faceted with hairs between ommatidia, these hairs longer on posterior half; their distance on frons 0.60–0.62 the width of rostrum in males, slightly wider apart in females, i.e., 0.66–0.70 the width of rostrum.

Rostrum short, much wider than long; sides nearly parallel; dorsum flat, without carinae or grooves; without anteocular groove; apical margin very weakly emarginate. Labrum with rounded distal margin. Mandibles as in fig. 2, with simple tip and a blunt tooth on inner edge. Scrobes lateral, foveiform, concealed

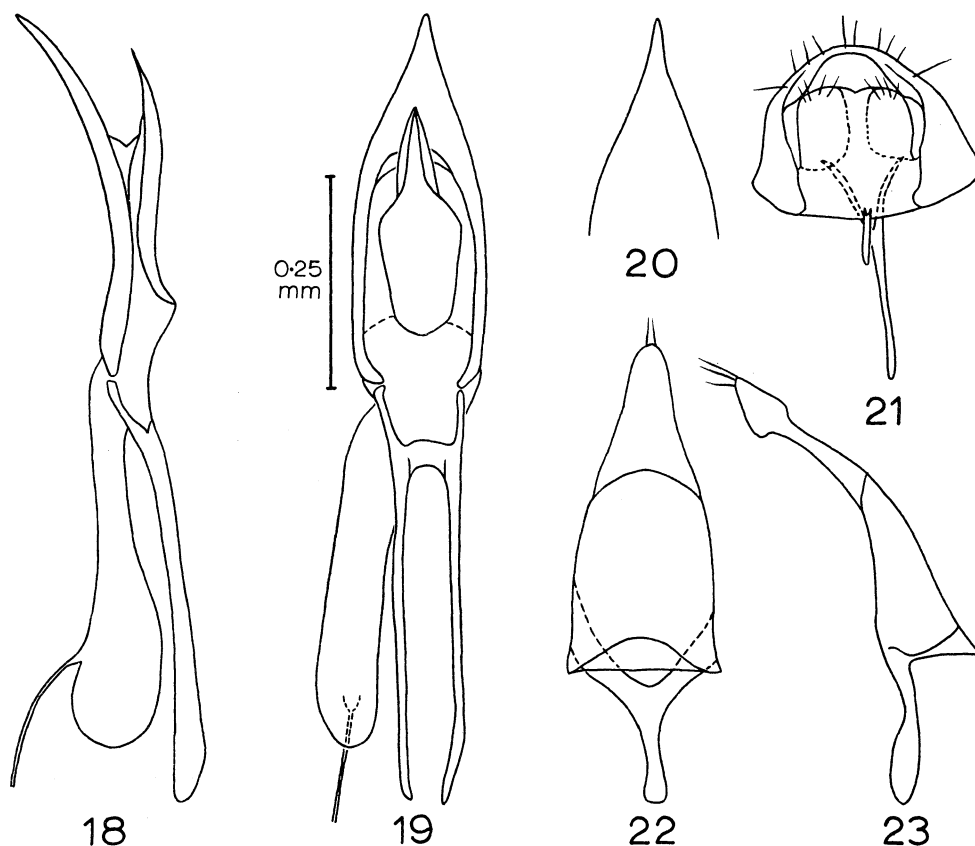


Fig. 18-23. *Lichenobius littoralis* Holloway, ♂, Big South Cape I: 18, aedeagus, lateral; 19, aedeagus, dorsal; 20, apex of pedon; 21, segment 8 and sternite 9, ventral; 22, tegmen, dorsal; 23, tegmen, lateral. From Holloway (1970). All fig. same scale.

from above. Antennae short, not reaching base of prothorax; first 2 segments similar in shape and length; club distinct, much wider than funicle, about as long as the preceding 4 segments of funicle.

Prothorax wider than long, widest near middle; anterior margin strongly leaning forward on to head in lateral aspect; base exposed, vertical, not covered by elytra; antebasal carina present or absent, lateral carina absent; dorsal convexity longitudinally weak, transversely strong, without callosities and tufts.

Scutellum small, rounded, squamose, as high as base of elytra, vertical.

Elytra parallel or widening, with rounded shoulders, without humeral callus; declivity rapidly falling. Base vertical in the middle, not proclinate; basal margin not or very slightly raised. Striole short, 0.20 the length of elytra. Striae distinct. Wings reduced, not functional.

Metepisternal suture distinct. All ventrites impressed along the median line in males, only ventrite 5 impressed in females. Pygidium without transverse groove; in males subtriangular, rounded at tip, not asperate, without raised margins, in females transverse, more or less truncate, asperate, with raised margins.

Trochanter with erect seta. Tarsi short; segment 2 weakly emarginate; segment 3 at least as long as 2, deeply bilobed, claw segment gradually but strongly widening, without dorsal or ventral lobes at tip; claws slender, with fine short tooth.

♂. Tergite 8 with apex rounded or slightly emarginate. Sternite 8 shallowly notched, with vestigial

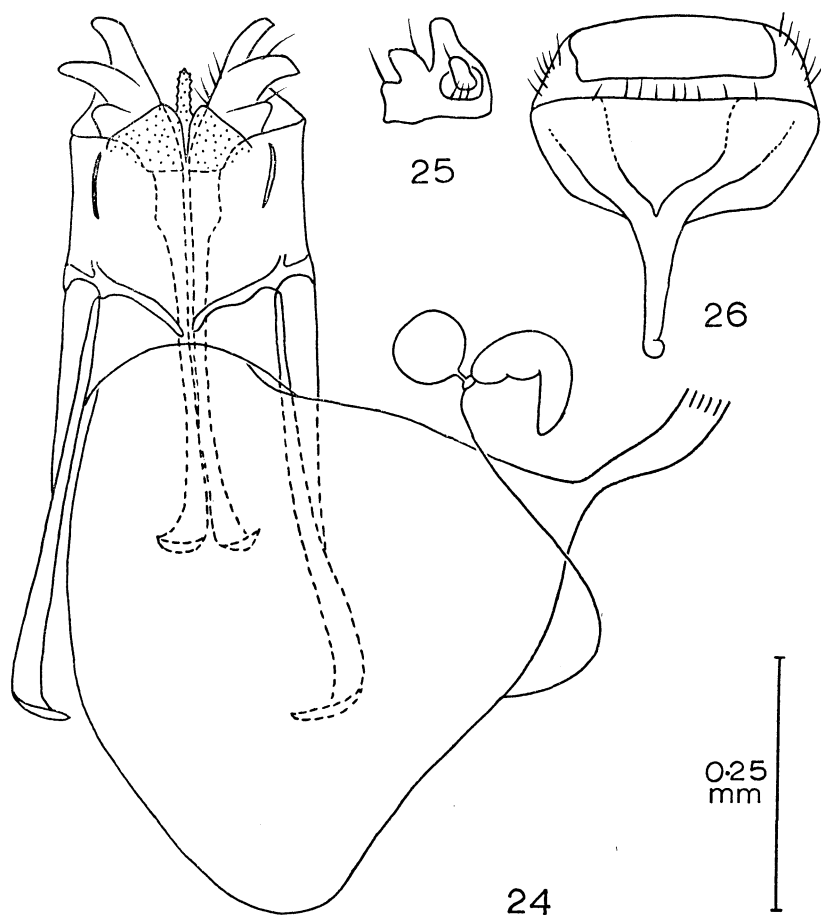


Fig. 24-26. *Lichenobius littoralis* Holloway, ♀, Big South Cape I: 24, genitalia, ventral; 25, toothed part of hemisternite, lateral; 26, segment 8, ventral. From Holloway (1970). All fig. same scale.

baculiform apodeme. Sternite 9 with well developed arms. Tegmen with body longer than apodeme, apex pointed in dorsal aspect, wedge-shaped in lateral aspect, with a small tuft of hairs at tip; apodeme narrow. Aedeagus with pedon undivided, its apex not truncate; apodemes articulated on pedon, leaving a distinct gap between apodemes and main body of aedeagus. Internal sac long, extending almost to end of apodemes, unarmed. Ejaculatory duct insertion ventral.

♀. Tergite 8 without lobes. Sternite 8 without lobes, with the sclerotized arms widely divergent; hairs confined to margin. Hemisternites with body distinctly demarcated from lateral rods; median rods short, joined along midline for part of their length, divergent at end; teeth long; stylus small. Vulva enclosed by a median dorsal membranous lobe and a pair of membranous lobes on the ventral surface. Bursa copulatrix without sclerites. Spermatheca not annulate. Spermathecal duct and gland inserting on common membranous atrium.

Type-species: *Lichenobius silvicola* Holloway.

Distribution: Chatham Is, Snares Is, Stewart I.

Remarks. This genus has only two species, one on the Chathams living on trees and shrubs, the other on the Snares and Stewart Island confined to the supralittoral zone.

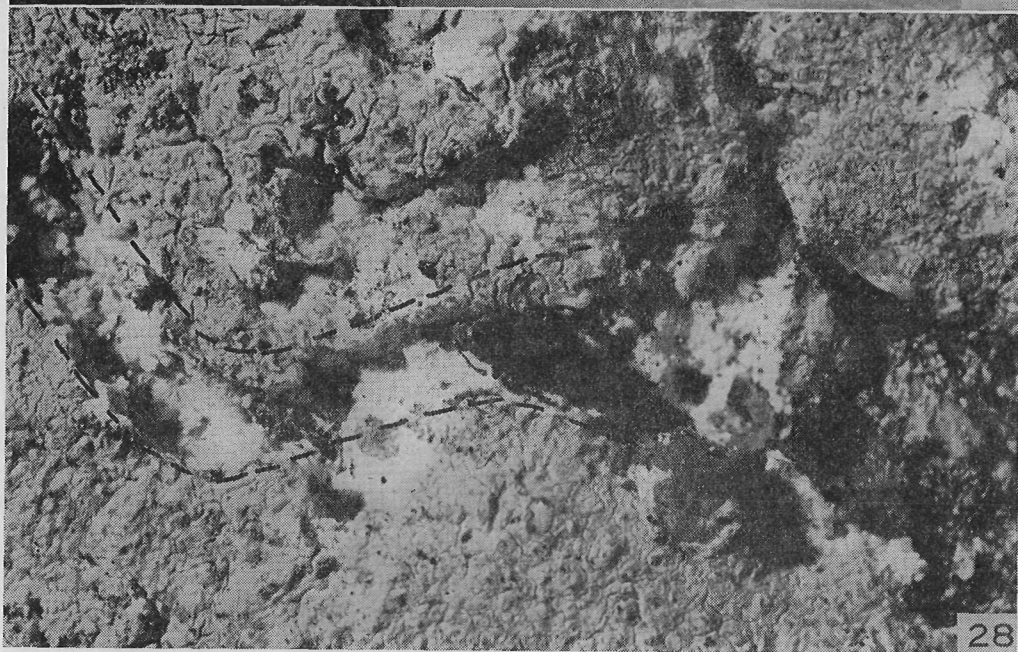
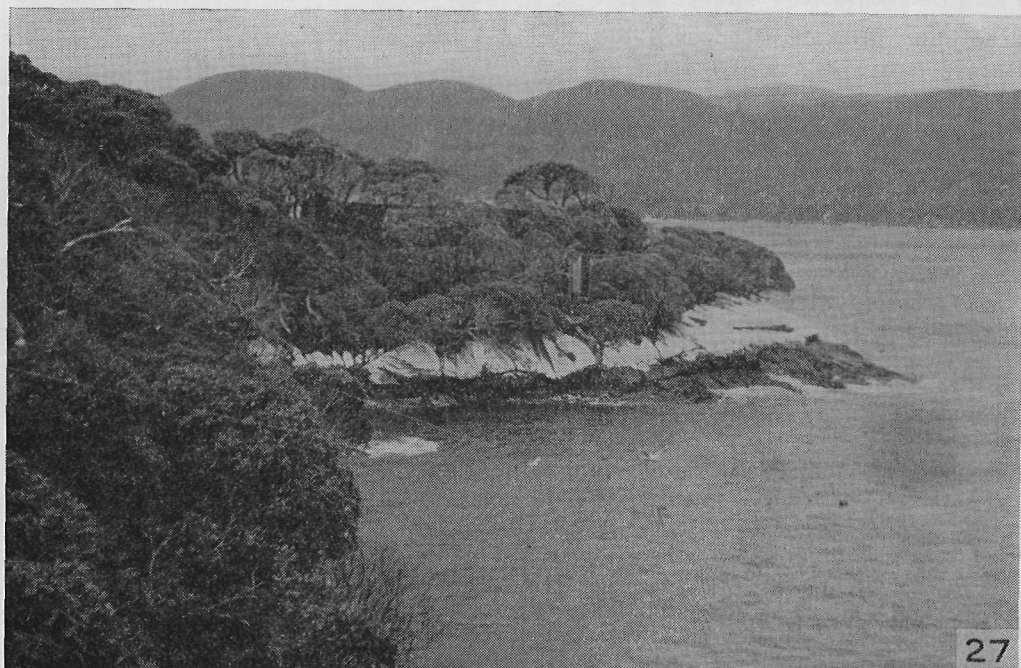


Fig. 27. Panoramic view of supralittoral white lichen belt and canopy of *Olearia grandis* on NE end of Big South Cape I. (Photo B. A. Holloway, Feb. 1955, from Kodachrome slide). Fig. 28. Close-up ($\times 9$) of the lichen *Pertusaria graphica* showing exposed larval gallery (indicated by broken lines) of *Lichenobius littoralis* Holloway (Photo B. E. Eykel, Entomology Division, D.S.I.R., Nelson).

Lichenobius littoralis Holloway, 1970 Fig. 5-8, 18-28.

Holloway, 1970, *N.Z. J. Sci.* **13**: 443, fig. 2, 4, 6, 8, 18-26.

Derm nigro-piceous, antennae and legs rufo-castaneous, but distal 1/2 of femora and last tarsal segments distinctly darkened. Vestiture silvery grey on head, rostrum, prothorax, elytra, mesepimeron, sides of metasternum, and metepisternum; elytra in males with a diffused dark spot of fine brown hairs at base of interstriae 2 to 4 and usually with a similar spot on interstriae 3 to 5, elytra in females with these same spots usually larger, extended towards the sides and also on to interstria 2, each elytron with its 2 spots often joined somewhere on interstriae 3 to 7.

Ocular distance on frons 0.60-0.61 the width of rostrum in males, 0.66-0.70 in females. Rostrum 1.62-1.73 \times wider than long in males, 1.50-1.54 \times in females. Antenna as in fig. 6.

Prothorax 1.04-1.12 \times wider than long, the higher range of ratios in males. No trace of antebasal carina.

Elytra 1.16-1.18 \times wider than prothorax in males, 1.29 \times in females, and 1.50-1.51 \times longer than their own width in males, 1.36-1.41 \times in females, subparallel in both sexes.

Wings 0.46 the length of elytra.

Ventrites sparsely hairy; deeply impressed along median line in males. Pygidium sparsely hairy in both sexes, shiny and with sparse obsolete puncta in males, dull, coarsely punctato-asperate in females.

♂. Tergite and sternite 8 as in fig. 21, tergite with rounded apical margin, sternite notched in the middle. Tegmen as in fig. 22 and 23, hairs very few and confined to extreme tip. Apex of pedon (fig. 20) broad and rounded, not attenuate.

♀. Segment 8 as in Fig. 26, its hairs short and sparse. Genitalia as in fig. 24 and 25, bursa copulatrix very wide; spermathecal duct insertion away from base of bursa.

Length: 1.70-2.10 mm; width: 0.77-1.00 mm.

SNARES. Station Point, 4.I.1967, 5 ♂♂, 2 ♀♀ on supralittoral lichens, P. M. Johns.

STEWART I. Big South Cape I. (off SW Stewart I): NE end, 5-21.XII.1968, 3 ♂♂ reared from mature larvae collected 20.XI.1968, J. S. Dugdale; from NE to SW, II. 1969, 92 ♂♂, 112 ♀♀: on encrusting lichens in spray zone, B. A. Kuschel, J. I. Townsend.

Ecology and bionomics. Adults and immature stages of this species are restricted to supralittoral lichens of rocky shores on the Snares and in the Stewart Island area. The lichen belt which is composed mainly of *Pertusaria graphica* appears as a striking broad white band (fig. 27). The orange larvae tunnel beneath the surface of the lichen but the roof of the gallery soon becomes eroded exposing a shallow channel as in fig. 28. Adults are seasonal, starting to emerge in December and being extremely abundant by February.

Remarks. As far as I know the life habits of this species are unique. *L. silvicola* Holloway from the Chathams apparently also lives in lichens but only those growing on bark of live trees and shrubs.

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