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## ACTIVITY OF ARBOREAL LANDHOPPERS (AMPHIPODA: TALITRIDAE) AT HALF WOODY HILL, MELALEUCA

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**Abstract** Comparison of the catch in ground pitfalls and hand samples with that from cups holding moss stapled to tree trunks showed that *Austrotroides leptomerus* is the only species out of five available landhoppers to be caught above ground in rainforest near Melaleuca. Low capture rates prevented further analysis of the effects of aspect, epiphyte cover or sucker density on the catch. Improvements in design for further studies of the activity of arboreal landhoppers are suggested.

### INTRODUCTION

Most members of the Tasmanian landhopper fauna live in the leaf litter of forest, scrub and sedgeland, but one or two species have unusual habits. *Keratroides albidus* is a specialised burrowing species (Friend 1987a), and *Orchestiella neambulans* and *O. quasimodo* prefer waterlogged litter in swamps and at the immediate edges of small streams and seepages (Friend 1987a, Richardson and Swain 1990). *Austrotroides leptomerus* and *A. longicornis* both appear to make extensive use of above ground habitats (Friend 1987b, Richardson and Swain 1990), i.e. litter trapped in branch axils, moss on tree trunks and branches, and the leaf axils of *Richea pandanifolia*.

This brief study aimed to compare the activity of landhoppers (as measured by their capture rate in pitfall traps) on the ground and on the trunks of trees,

**Table 1. Characteristics of trees used for trunk traps at Half Woody Hill.**

Epiphyte spread *even* indicates evenly spread around the trunk, *denser on S* indicates denser growth on the south facing side.

Tree No.	Diameter (m)	Epiphyte height	Epiphyte spread	Suckering density	Trap Type
1	1.28	3-4cm	even	sparse	up
2	0.86	>4cm	denser on S	dense	down
3	0.87	<1cm	denser on S	sparse	up
4	0.78	<1cm	denser on S	dense	down
5	1.00	2-3cm	even	medium	up
6	1.18	no growth	denser on S	sparse	down
7	1.08	<1cm	even	dense	up
8	1.24	no growth	denser on S	dense	down
9	0.68	no growth	even	sparse	up
10	0.70	2-3cm	even	sparse	down

following Friend (1987b). In addition, traps set on tree trunks were arranged to examine the effect of aspect on catch rate. The relative contributions of upward and downward movements of animals to the catch in trunk traps was examined by Moeed (1983) in New Zealand forests, and in this study similar attempts were made to partition the catch.

## SITE AND METHODS

Half Woody Hill is a small hill approximately 3 km south east of Melaleuca, just east of the South Coast Track. The knoll supports a small patch of temperate rainforest on its southern side.

Ten trees, all *Nothofagus cunninghamii*, were selected within 30m of each other. Four trunk traps were placed on each tree, on the north, south, east and west facing sides. Each trap consisted of a plastic drink cup, 5cm in diameter and 10 cm deep, fixed in place with tape stapled tightly to the tree so that the rim of the cup was pressed against the trunk. Moss was placed in each cup as a refuge for the animals. Thus the "traps" were not places from which the animals could not escape, but mimicked an above-ground litter accumulation. The traps on alternate trees were provided with a collar of nylon mesh stapled around the

trunk which was intended to prevent animals moving further up, or down. The down barriers were fitted around the trunk at the levels of the trap lips and the up barriers were stapled to the trunk above the traps. The traps were left in place for two weeks.

The diameter of each tree at the height that the traps were fixed (approx. 2m) was measured, and the height of epiphytes and the density of suckers were estimated. Pitfall traps, consisting of a cup filled with 10mls of saturated picric acid and protected from the rain by a petri dish, were set at the base of each tree. Hand samples of the landhoppers in the ground litter were collected at each tree using an aspirator.

## RESULTS

The size, epiphyte height, sucker density and trap type of each tree are recorded in Table 1. The catches of animals in the trunk traps, the ground pitfalls and hand samples at each tree are recorded in Table 2. The only species caught in the trunk traps was *Austrotroides leptomerus*, with the exception of two *Keratroides vulgaris* caught on tree 7. Since these two animals were dead and dried, while the other animals caught in trunk traps were alive, it is likely that they were put in the trap with the moss. Five species were present in hand samples from the ground litter; in order of abundance these were *Mysticotalitrus cryptus* > *Keratroides vulgaris* > *Neorchestia plicibrancha* > *M. tasmaniae* > *Austrotroides leptomerus*. In the pitfalls, four species appeared; in order of abundance *N. plicibrancha* > *K. vulgaris* > *M. cryptus* = *A. leptomerus*. There were no statistically significant differences between the relative frequencies of catches in the pitfall and hand samples ( $\chi^2 = 7.8$ ,  $p = 0.1$ ). The number of animals caught in the trunk traps (11) was too small to allow any detailed analysis of differences between aspects or up and down traps.

## DISCUSSION

This study is a slight improvement on that of Friend (1987b) which failed to catch any animals in trunk traps at South Cape Bay. However, it is clear that to gain any information on the activity of arboreal amphipods either trapping methods need to be improved, or traps will have to be left for longer periods, or more of them will have to be used.

Moed (1983) used a much more elaborate trap design in his study of arthropod movements on tree trunks in New Zealand. Moed did succeed in partitioning upward and downward-moving animals, but the data presented here are not extensive enough to draw any conclusions. It may be that the mesh barriers used did not impede the landhoppers' movements significantly. Richardson (1992a) used a similar, simple trap design in a study of arboreal

**Table 2. Numbers of five species of landhoppers caught in trunk traps on ten *Nothofagus cunninghamii* trees at Half Woody Hill, with the catches in pitfall traps and by hand at their bases. No animals were caught in trunk traps on four of the ten trees.**

	<i>Mysticotalitrus tasmaniae</i>	<i>Mysticotalitrus cryptus</i>	<i>Neorchestia plicibranchia</i>	<i>Austrotroides leptomerus</i>	<i>Keratroides vulgaris</i>	Total
<b>Tree traps</b>						
N	0	0	0	3	2	5
S	0	0	0	3	0	3
E	0	0	0	3	0	3
W	0	0	0	0	0	0
Up traps	0	0	0	3	2	5
Down traps	0	0	0	6	0	6
All trunk traps	0	0	0	9	2	11
<b>Ground collections</b>						
Pitfall	0	1	5	1	3	10
Hand	9	16	10	1	13	49
Total ground	9	17	15	2	16	59

landhoppers in Hawaii, and was able to derive useable data by returning to the traps over a period of several weeks. In the very wet environment of the Hawaiian mountains the moss in the traps did not dry out. However, at Half Woody Hill in February drying was a problem and the trap design might be improved by adding a drip-feed watering system to keep the moss moist. This might also increase the attractiveness of the traps to the landhoppers.

Despite the low catches, *Austrotroides leptomerus* appears to be the dominant (probably the only) species moving on trunks at this site, supporting Friend's (1987b) assessment of their preferred habitat. Whether this species spends most of its time above ground, or in the ground litter, remains unclear. It was caught regularly in pitfall traps at Cox Bight in vegetation which had little or no above ground litter or moss (Richardson 1992b), so its arboreal activities do not appear to be obligatory.

*Mysticotalitrus tasmaniae* is known to climb the trunks of eucalypts in wet gullies on Mt. Wellington (R.B. Mawbey, pers. comm.), but this may be related

to feeding rather than colonising litter and moss above the ground. It is possible that other species at Half Woody Hill are climbing the trunks but not entering the "traps", because they seek refuge in the ground litter. The use of sticky traps in conjunction with the present trap design would identify those animals which were climbing to seek food rather than refuge.

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## GREAT CRESTED GREBES AT ORIELTON LAGOON AND PITTWATER

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I have been concerned to notice the recent apparent scarcity of great crested grebes *Podiceps cristatus* at Orielson Lagoon and Pittwater. In earlier years, particularly during winter months, it was quite common to see half-a-dozen or more quite close to the causeway. In case I had got the wrong impression from my irregular visits I asked some other observers who are often in that locality