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The New Zealand species of *Metrosideros* Are divided into two groups onthe basis of vegetative bud form and position. One group, comprising *M.excelsa* was also distinguished on flora (refer to Dawson article 2) The three groups delimited in the latter paper don't differ from each other significantly in vegetative bud features. Includes diagrams of identification features for *M.excelsa*.

## THE VEGETATIVE BUDS OF THE NEW ZEALAND SPECIES OF METROSIDEROS

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### SUMMARY

The 11 New Zealand species of *Metrosideros* are divided into two groups on the basis of vegetative bud form and position. One group, comprising *M. excelsa*, *M. kermadecensis*, *M. robusta*, and *M. umbellata*, was also distinguished on floral features by Dawson (1968). The three other groups delimited in the latter paper do not differ significantly from each other in vegetative bud features.

On the basis of vegetative bud form and position the New Zealand species currently assigned to *Metrosideros* can be divided into two groups. Group A—*M. excelsa*, *M. kermadecensis*, *M. robusta*, *M. umbellata*. Group B—*M. perforata*, *M. fulgens*, *M. parkinsonii*, *M. carminea*, *M. diffusa*, *M. colensoi*, *M. albillora*.

### GROUP A

In this group the apices of vegetative shoots generally abort during the growing season and pairs of overwintering buds develop in the axils of the adjacent leaf pairs (Fig. 1 A, C, D, E) and often also in the axils of the leaf pairs next below. Each bud is protected by up to eight pairs of scales (Fig. 1 A, C, D, E), which drop off when the shoot develops, leaving a close-set series of scars at its base (Fig. 1 B).

The branching pattern exhibited by these species, which might be termed "pseudo-dichotomous", is the reason for their much-branched spreading habit. The expression of this growth pattern in young plants, however, is often irregular. Here vegetative growth may continue through the winter and any dormant buds that are formed may be terminal as well as axillary.

### GROUP B

Here there is no regular abortion of vegetative apices and when it does occur (Fig. 2 A, E) it may be due to external rather than internal causes.

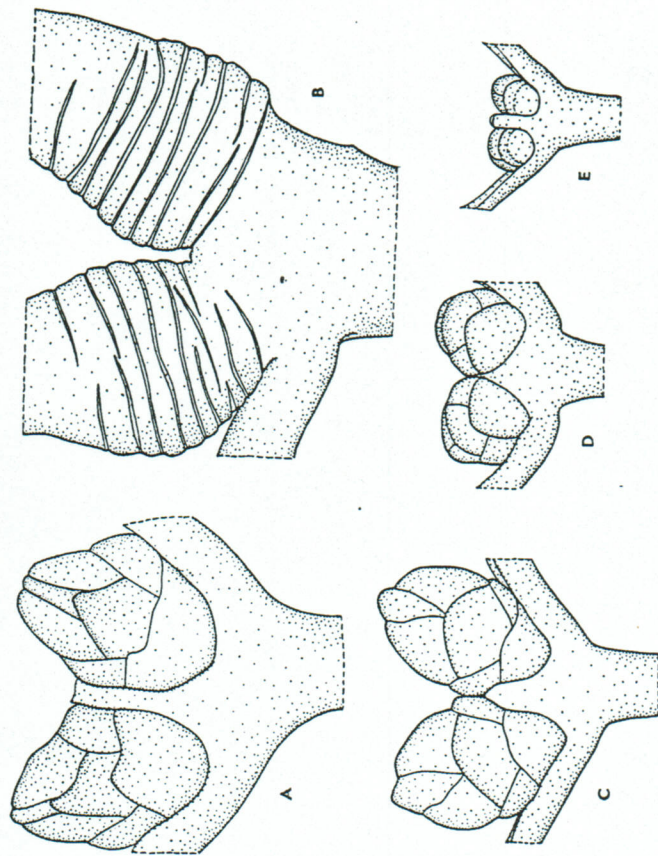


Fig. 1—*Metrosideros*, Group A. Vegetative buds: (A) *M. excelsa*, (C) *M. kermadecensis*, (D) *M. umbellata*, (E) *M. robusta*. Bud scale scars: (B) *M. excelsa*. ( $\times 3.5$ )

Dormant buds, axillary or terminal, are small with only the outermost pair of immature leaves visible (Fig. 2 B, C, D, F, G, H). When a bud develops, a distinct internode is formed between the leaf axil and the first pair of leaves, which expand and become green, but remain small (Fig. 2 C, D, E). In other cases, although an internode develops below them, the leaves of the first pair remain scale-like (Fig. 2 A, F, G, H).

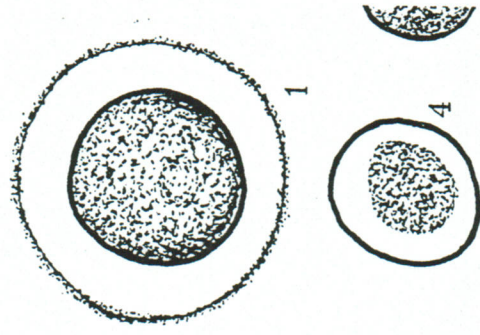
In *M. colensoi* it was noted that when buds develop on young stems before cork formation has begun there is usually a sharp transition from small to full-sized leaves (Fig. 2 A), but when they develop from older stems the transition may be gradual, and often the leaves of the first pair retain their axillary position and remain small (Fig. 2 B).

### DISCUSSION

Group A corresponds with one of the groups delimited on the basis of flower and fruit morphology by Dawson (1968). The present paper provides further evidence for the distinctiveness of the group and widens the gap between it and *Metrosideros perforata*, which was regarded as an allied species in the cited paper.

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Although mountaineers have of New Zealand, nothing seen organisms concerned. In Janu: from a site at Eric Stream, F River), at an altitude between the liquid filtered off, and the the paper. A subsample was contain two kinds of spherical



Figs. 1-7—Resting cells from *M. antarcticus* Wille (?)  $\times 1000$ . 1, 4—cells with thick cell wall. 3, 7, 4-6—smaller cells.

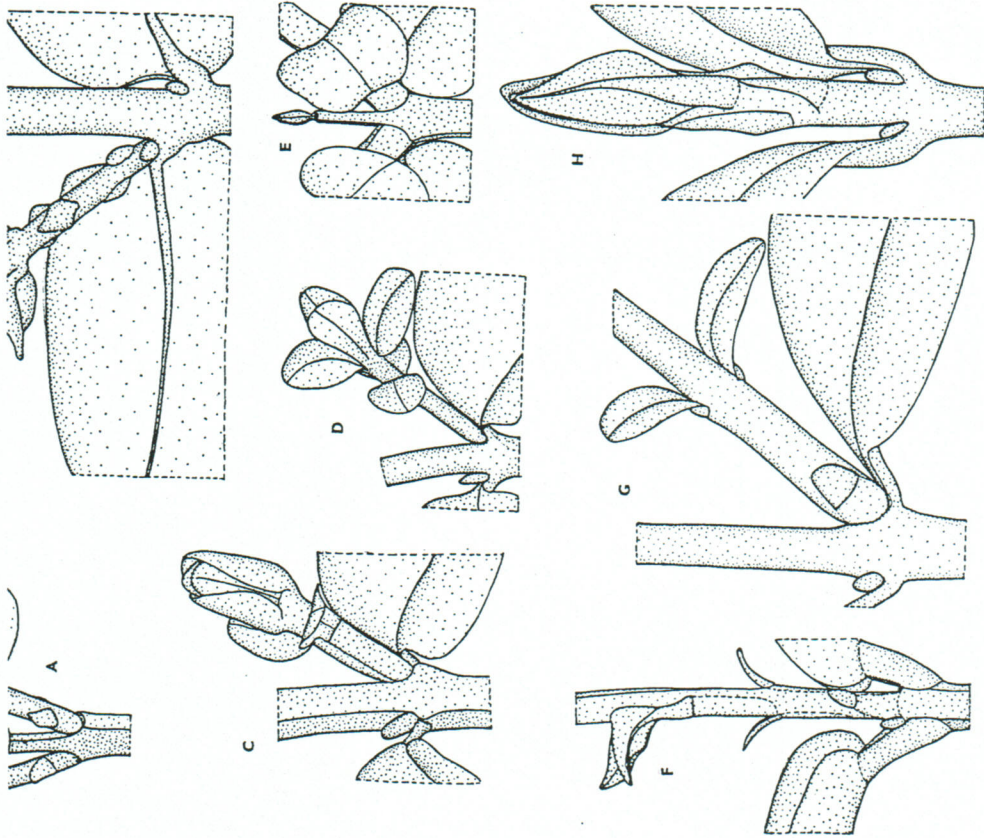


FIG. 2.—*Metrosideros*, Group B. Vegetative buds and young shoots: (A), (B), *M. colensoi*, (C) *M. carminea*, (D) *M. perforata*, (E) *M. diffusa*, (F) *M. parkinsonii*, (G) *M. fulgens*, (H) *M. albiflora*. ( $\times 3.5$ )

REFERENCE

DAWSON, J. W. 1968: An analysis of flowers and fruits of New Zealand *Metrosideros*. *N.Z. J Bot.* 6(1): 43-55.