

FORUM

SOME DIFFERENCES BETWEEN PLANTS OF THE CHATHAM ISLANDS AND THE NEW ZEALAND MAINLAND

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A number of Chatham Island plants show morphological differences from related plants on mainland New Zealand. These differences could have arisen as a result of freedom from moa browsing on the Chatham Islands. A possible test for this hypothesis is suggested.

Keywords: Chatham Island plants; moa browsing; juvenile forms.

Some differences between Chatham Island and New Zealand mainland plants are fairly widely known: the presence of several endemic large-leaved herbs on the Chatham Islands (the forget-me-not *Myosotidium hortensia**, the sow thistle *Embergeria grandifolia*, and *Aciphylla dieffenbachii*), the lack of divaricating juvenile forms in the Chatham Island ribbonwood (*Plagianthus*) and kowhai (*Sophora*), and the juvenile hoho (*Pseudopanax chathamicus*) not having the stiff deflexed leaves so characteristic of the juvenile lancewood on mainland New Zealand. A recent first visit of one week to 'the main Chatham Island not only brought home these differences to me but' also let me see several other morphological differences not widely reported.

The juvenile nikau (*RhopaJostylis*) has much broader "leaflets" giving the plants a very distinct, more leafy appearance. The Chatham Island form of *Phormium tenax* has leaves somewhat broader and not as stiff as the mainland forms with the tops of the leaves bending over in a similar way to *Phormium cookianum*. Three Chatham Island forest trees (*Dracophyllum arboreum*, *Coprosma chathamica* (Dawson, 1991), and *Pseudopanax chathamicus*) have juvenile forms with leaves markedly broader than the adult. Juveniles of forest trees and lianes in all forests grow under conditions of much lower light, greater humidity and

less wind than the adults, and other things being equal, one would expect the leaves of juvenile plants to be larger, but on the New Zealand mainland this is not the norm. In fact a number of New Zealand forest plants have markedly smaller juvenile leaves, for example, *Hoheria sexstylosa*, and the lianes *Rubus schmidelioides*, *Passiflora tetrandra*, *Parsonia heterophylla* and *Muehlenbeckia australis*. The last of these also occurs on the Chatham Islands, and the form there does not have the small-leaved juvenile so characteristic of the New Zealand mainland plants.

Coprosma propinqua var *martinii*, which grows in open wet areas on the Chatham Islands, has small leaves and dense branching but the branching angle is somewhat less than that characteristic of most mainland forms of the species, so that the branches remain separate. *Coprosma acerosa* growing on Chatham Island sand dunes has more open and less interlaced branching than mainland forms of the species. Another plant showing differences from New Zealand mainland plants is *Aciphylla traversii*. It is now rare as a wild plant because of browsing by cattle, and I did not see it. It has leaves somewhat similar in form and appearance to some mainland *Aciphylla* species, but not sharply pointed (Atkinson and Greenwood, 1989).

It seems reasonable to assume that where related plants occur on the Chatham Islands and on the New Zealand mainland, the Chatham Island plants would have originated from the mainland, and differences in morphology that have arisen would reflect environmental differences between the Chatham Islands and mainland New Zealand. One environmental factor on mainland New Zealand in the past which did not occur on the Chatham Islands was browsing by moa and some other leaf-eating birds (Atkinson and Millener, 1991). All the morphological differences noted above could have evolved as a result of freedom from moa browsing on the Chatham Islands. This is also consistent with the devastating effect domestic stock have on Chatham Island forest vegetation, where no juvenile

*Nomenclature follows Connor and Edgar (1987) and sources therein.

woody forest plants appear to show any resistance to browsing by mammals. Among the large-leaved herbs, *Urtica australis* stands out as being one species resistant to browsing, although it has few stinging hairs.

If lack of moa browsing in the past is the reason for the morphological differences of the Chatham Island plants, it seems likely that these plants would be better adapted than mainland forms to growth under forest conditions in the absence of browsing. This could be tested for by growth rate comparisons under reduced light.

Differences in chemical constituents and palatability may also have arisen and could be tested for. Is *Astelia chathamica* (now uncommon as a wild plant because of browsing by introduced mammals) actually more palatable than related mainland species such as *Astelia grandis* or *A. fragrans*? Is the juvenile broad-leaved form of *Dracophyllum arboreum* more palatable to mammals than mainland *Dracophyllum* species? It certainly appears to be relatively palatable from observations along a reserve fenceline.

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