A Manuka Plant with Unusual Flowers, Dun Mountain, Nelson

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On a visit to Dun Mountain by members of the Wellington Botanical Society in early January, 1981, Peter McIntosh noticed that a shrub of manuka (*Leptospermum scoparium*) growing beside the track, where it crosses Windtrap Gully, had unusual flowers. All the petals were deeply lobed instead of being rounded, giving the plant a striking appearance. (In case anyone wants to see whether the plant is still there the approximate grid reference and altitude are NZMS1 S20 710217 and 700 m.)

In the hope of propagating the plant for horticultural purposes I took a branch and some days later set numerous cuttings in sand, in a pot totally enclosed in a plastic bag. The branch showed signs of drying out, so I held little hope of any of the cuttings rooting. However, I was lucky: one did root. This was potted up the following spring (1981) and a year later was planted out in the garden (1982).

In December 1984 the plant, not yet a metre tall, flowered profusely and all the flowers had their petals lobed as in the original wild plant. This was entirely as I had expected, assuming the "lobed-petal" character to be

Fig. 1. Plant of manuka grown from a cutting from Dun Mountain, showing a flower with lobed petals and a flower with normal petals, on adjacent shoots. (Photo 11/12/1985 A.P. Druce).

genetically inherited. By this time I had already taken cuttings off the plant in a second attempt to raise a number of plants for distribution. But, as before, I obtained just one rooted plant. This is now planted out; so far it has not flowered.

The big surprise came in December 1985 when I noticed that the first garden plant was producing both, flowers with normal petals, and flowers with lobed petals. The two kinds of flower were often on adjacent shoots (Fig. 1.). Furthermore, a closer look revealed some flowers of an intermediate type, in which some petals were lobed, some not.

Clearly, the "lobed-petal" character of this particular manuka plant is not stable. But what caused this character to be expressed in all flowers in one year, but only in some flowers, and only in some petals of others, the following year?

I asked Dr E.J. Godley to comment on the above article and he replied, in part, as follows: "I expect that this is caused by a combination of genetical and environmental influences similar to the varying proportions of hermaphrodite and male flowers discussed in the enclosed extract from Primack and Lloyd's paper".

Extract from Primack and Lloyd (1980);

> "In manuka, there are striking differences among populations and among individuals of the same population in the proportion of the two flower types . Three lines of evidence show that a major portion of this variation is under environmentally induced physiological control. First, nutrients supplied to the plants increased the percentage of hermaphrodite flowers. Second, the flowers on the upper part of the plant (most exposed to light or benefitting from apical dominance) showed a higher percentage of hermaphrodite flowers. Third, the percentage of hermaphrodite flowers on some plants showed major changes in two successive years. The correlation between successive years in the percentage of hermaphrodite flowers in manuka plants suggests that there is some stability in the factors controlling the ratio of the two flower types. It is not possible at this time to say if this correlation is due to genetic differences among individuals or to long-term environmental effects, such as the age of the plants, the growth history of the plants, or permanent micro-site differences. Such a permanent size and age structure can occur in manuka populations. Manuka plants can grow to a much greater size than that of the plants used in this study, but the sexual behaviour of larger plants is not yet known."

Postscript

(January 1987) When the first garden plant flowered again in December 1986, at first glance all the flowers appeared to have deeply-lobed petals. However, a close examination of every flower on the plant revealed one with normal petals. This was in marked contrast with the previous year's flowering discussed above.

REFERENCE

Primack, R.B.; Lloyd, D.G. 1980: Andromonoecy in the New Zealand montane shrub, manuka, *Leptospermum scoparium* (Myrtaceae). *American Journal of Botany 67*: 361-8.