Two Interesting Plant Records from Mt Pirongia, Western Waikato

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Introduction

At 959 m a.s.l. Mt Pirongia is the highest mountain range in the Waikato and dominates the southwestern skyline of the Hamilton Basin. It is a Late Pliocene-aged, remnant of a basaltic/ andesitic volcanic complex (Briggs 1983, Briggs *et al.* 1989). Although its upper most parts mostly carry a low forest of tawheowheo (*Quintinia serrata* s.l.), and kamahi (*Weinmannia racemosa*) in some places the combination of high rainfall, aspect, slope, and peaty skeletal soils, has produced small areas of low scrub and bare rock. As a rule these become more common toward the local high points (i.e. > 750 m a.s.l.) centered on the main northeast-southwest trending summit ridge. In these sites a biogeographically interesting flora often containing northerly extensions of Central Volcanic Plateau species can be found (see Clayton-Greene 1978; Clarkson 1982; Druce 1990; de Lange 1994a,b).

In this article I discuss the occurrences on the range of two plant species, hutu (*Ascarina lucida*) and mountain totara (*Podocarpus nivalis*). Hutu was originally reported by Bell (1972) without a supporting herbarium specimen, while the mountain totara, originally discovered by the author in 1985, has been overlooked in recent literature dealing with the species, e.g., Wardle *et al.* (1988), despite being supported by an appropriate voucher.

Hutu (*Ascarina lucida*) (Chloranthaceae)

McGlone & Moar (1977) discussed the abundance of hutu in relation to post-glacial climate change. They noted the scarcity of records from the North Island and discussed this in relation to climatic changes over the last 10 000 yr B. P. Bartlett (1984) added to the North Island distribution of the species, noting additional locations to those discussed by McGlone & Moar (1977) and confirming a few others. He made a useful observation about the distribution of hutu in the North Island, "it seems to be able to colonise sites that have been recently disturbed in some way". Certainly in all the North Island sites where I have seen hutu, it is invariably associated with regenerating vegetation on slips, windswept ridge tops, or, as in the Kauaeranga Valley, old tracks and milled forest.

With regard to the Pirongia record, Bell (1972) left no voucher or record of where he found hutu. In 1980, just one year before his death, he told me he had found the species near Kopunui, a local high point well north of the main Pirongia Range but still part of the former Pirongia Forest Park (Chavasse & Johns 1983). I communicated this fact to B. D. Clarkson in 1982, which is presumably the basis for his statement of its occurrence on Koponui, as reported in McGlone *et al.* (1984).

During August 1988, while on an abortive search for the mysterious "Pirongia Lake" my colleague M.D. Rosenberg and I located a mature hutu tree on a slip near Taylor's Clearing. Unfortunately the specimens gathered from this tree were lost through misadventure. On the 14 December 1997 a successful search for another Bell "myth", *Danhatchia australis* (see de Lange & Molloy 1998), discovered another hutu (AK 234412, Fig. 1 & 2), growing close to the track leading up the Blue Bull Stream from near its confluence with the Kaniwhaniwha Stream. Later that day, hutu trees were also seen higher up the main ridge leading to Taylor's Clearing. These were not vouchered.

Hutu, although a distinctive species, is often confused with pukatea (*Laurelia novae-zelandiae*) (Bartlett 1984). So although the material gathered for AK 234412 is, as reported on that specimen's label, "moth eaten", I reproduce here an enlargement of a piece from that specimen, to show the distinctive "hair-like" stipules and worm-like inflorescence (arrowed) of *Ascarina* (Fig. 2).

I am of the opinion that this record confirms the occurrence of *Ascarina* from Pirongia as reported by Bell (1972; pers.comm., 1980). I consider this because: 1., the specimens I have seen come from an area frequented by Bell (see de Lange & Molloy 1998), 2., the Kaniwhaniwha Valley via Taylor's Clearing gives one the most direct westerly route to Kopunui, and 3., in relation to Pirongia summit, this location is indeed, "near Koponui".

Mountain totara (*Podocarpus nivalis*) (Podocarpaceae)

The Cone (945 m a.s.l.), is a relatively isolated, high point located to the west of the main summit ridge. Along the eastern flanks of the Cone, above the headwaters of the Kaniwhaniwha Stream are a series of narrow,

spine-like ridges. In 1982, B. D. Clarkson discovered, on one of these ridges, a small area of vegetation in which *Cyathodes empetrifolia**, *Pentachondra pumila* and what he then considered to be mountain totara (*Podocarpus nivalis*) were present. A specimen of the latter was subsequently collected by A.P. Druce (CHR 469592!) and was identified by B.P.J. Molloy (15 July 1991) as the hybrid, *P. hallii x P. nivalis*.

East of the Cone is the main summit ridge of Pirongia. Although this ridge slopes gently to the north, the southern margin is delineated by a series of steep cliffs dropping into the headwaters of the Hihikiwi Stream. These cliffs are significant refugia for many montane grasses, herbs and shrubs (see introduction). For two weeks over the summer of 1984-1985 I camped at the Pahautea Emergency Shelter whose location between the main summit ridge and Hihikiwi Peak made possible the systematic exploration of the summit cliff system. During this time several discoveries were made, one of which was a single large (2 x 2 m) specimen of what I considered to be *bona fide* mountain totara (AK 170457, Fig. 3). Associated with the mountain totara at the time was a diverse assemblage of other subalpine or cool-climate species, including *Chionochloa conspicua* subsp. *cunninghamii*†, *Cyathodes empetrifolia* (AK 170458), *Euphrasia cuneata* (AK 170290), *Ourisia macrophylla* subsp. *robusta* (AK 170289), *Rytidosperma setifolia*† and *Trisetum* aff. *antarcticum*† (*T.* "Mountain" see de Lange & Edgar 1998).

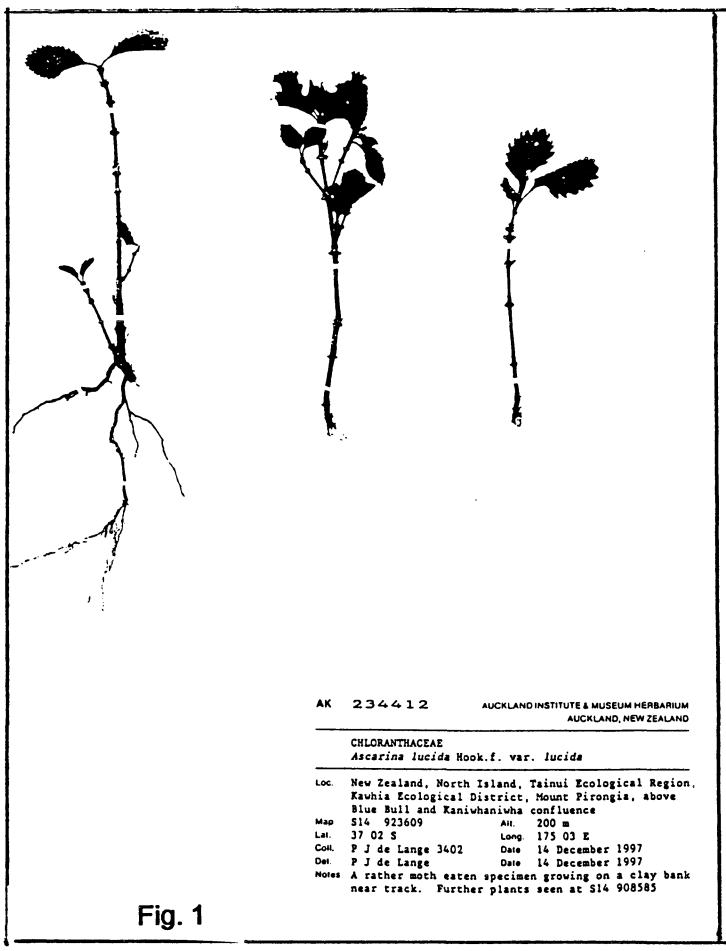

Fig. 1

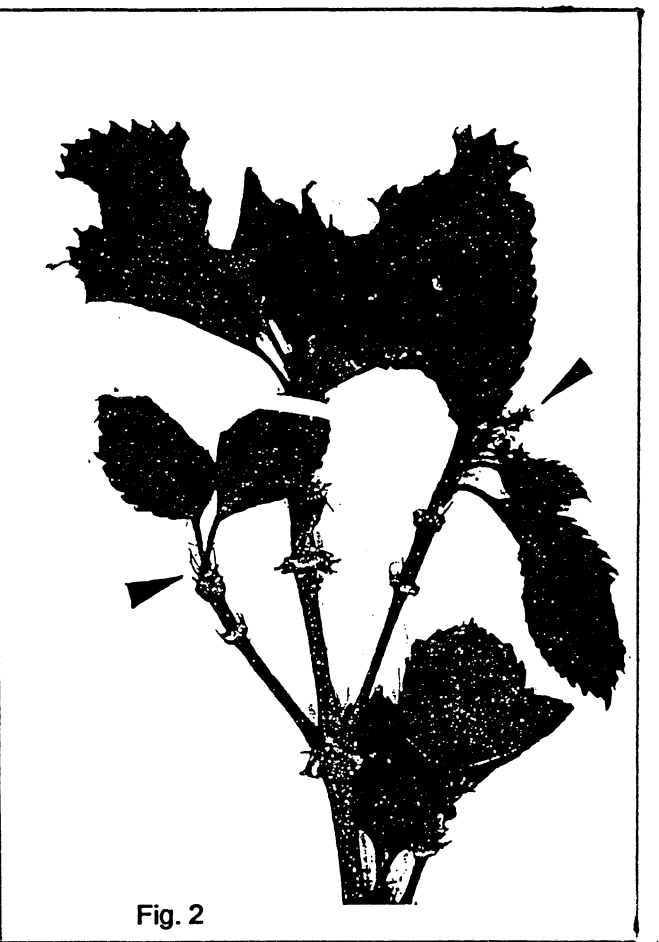
Fig. 2

Figure 1. ***Ascarina lucida*** **(Chloranthaceae) specimen from Mt Pirongia (*de Lange 3402*, AK 234412)**
Figure 2. Close up of central piece on specimen AK 234412. Arrowed, the distinctive inflorescence and "hair-like" stipules diagnostic of *Ascarina lucida*.

The specimen of mountain totara I obtained (AK 170457) is sterile (Fig. 3). Thus, despite this specimen possessing the distinctive thick, awl-shaped leaves and diagnostic tiny mucro of *P. nivalis*, A.P. Druce (*in litt.* 1990) advised me that there had been doubts cast as to the validity of my identification. Therefore, I resolved to

obtain another specimen whenever there was a suitable opportunity. Seven years later, on the 30 December 1997 I ascended the mountain again, I soon located the mountain totara, although in the intervening years the habitat had changed, and many of the interesting associates noted in 1985 had gone, presumably because they had been smothered by the now dense growths of *Chionochloa conspicua* subsp. *cunninghamii*. The mountain totara had experienced some die back but I managed to collect a small fruiting piece (AK 234410, Fig. 4). Back in Auckland, having fully satisfied myself that this specimen was indeed
mountain totara, I forwarded the collection to B.P.J. Molloy (who is revising the indigenous New Zealand conifers) for a second opinion. It was the view of B.P.J. Molloy that the "specimen is *P. nivalis* without doubt" (Fig. 4).

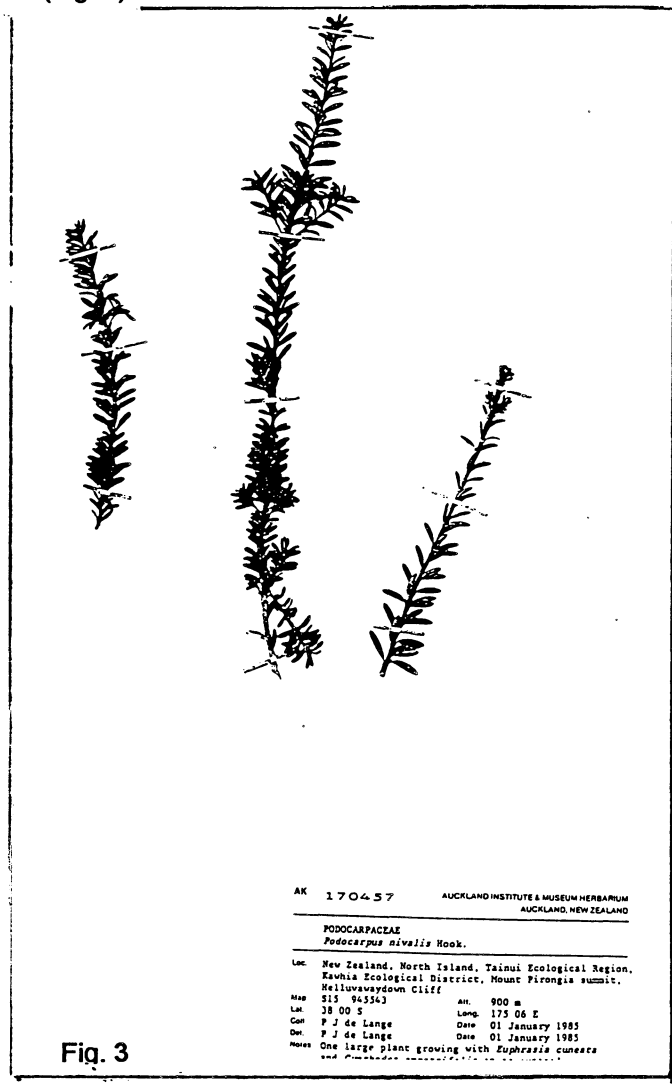

Fig. 3

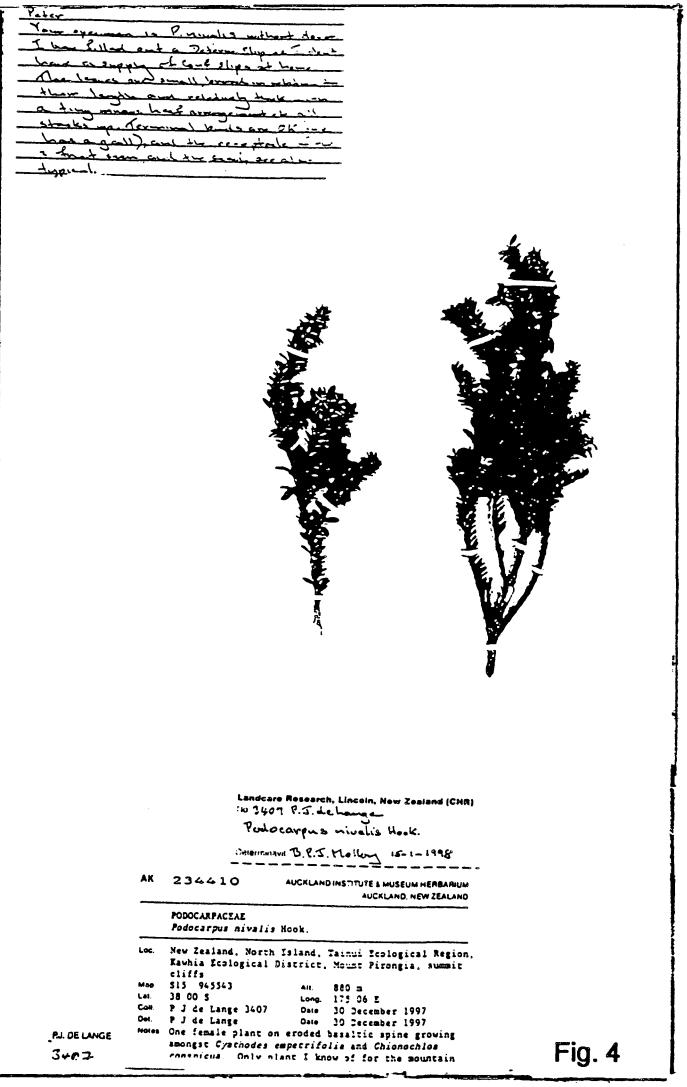

Fig. 4

Figure 3. *Podocarpus nivalis* (Podocarpaceae) specimen from Mt Pirongia (*de Lange s.n.*). The original sterile collection gathered in 1985.

Figure 4. *Podocarpus nivalis* (Podocarpaceae) specimen from Mt Pirongia (*de Lange 3407*). Two pieces, one with immature fruit. Top Left Hand Side: Letter from B.P.J. Molloy confirming identification of the specimen.

With this confirmation comes a plethora of questions which I hope one day to resolve. For example, is there any further mountain totara occurrences on the range? Having searched most of the likely habitats I think this is unlikely. However, the presence of the hybrids found by B.D. Clarkson on the north eastern side of the Cone *c.* 2 km from the mountain totara I discovered, suggests that other mountain totara may still, or may once have, occurred in the vicinity. This suggestion does not agree with that offered by Wardle *et al.* (1988) for other northerly occurrences of *P. hallii* x *P. nivalis*. For instance, they suggest that the presence of such hybrids on Te Moehau, in the apparent absence of mountain totara on that mountain, is caused by the long distance dispersal of mountain totara pollen from the Volcanic Plateau (the next nearest known occurrence of this species). I

consider this hypothesis rather unlikely. Both Te Moehau and Mt Pirongia, are located west of the Central Volcanic Plateau, and thus out of the prevailing southwesterly wind stream, suggesting that it would be very unlikely that wind-borne pollen from the plateau would ever reach these peaks.

There are some further avenues of research which may provide clues as to its origin of the mountain totara on Pirongia. To discount the possibility that this specimen was planted on the mountain one could try sampling the wood to obtain an age from the growth rings. This would help provide the age of establishment which may assist in determining the likelihood of its being planted (B.P.J. Molloy pers. comm.). Similarly, soil samples from around the specimen could reveal allochthonous matter. However, the most sensible option for further research would be to sample the peaty soils of the mountain for their pollen. Palynology should assist in revealing the nature of the past vegetation of the mountain, and may even confirm what others have suggested (e.g., Clarkson 1982), i.e., that Pirongia has acted as an important western refugia for many montane and subalpine species, otherwise extirpated from the western Waikato. The major factor limiting the diversity of this relict flora is not so much the distance from seed sources but the size and range of habitats available on the mountain (Clarkson 1982; B.D. Clarkson pers. comm., 1990; cf. Clayton-Greene 1978).

However, these are matters for future research. In the interim I would argue that the presence of other cool-climate or subalpine indigenous plants in direct association with the mountain totara, in similar sites on the mountain, is the most logical reason to treat the occurrence as natural. Furthermore, as mountain totara is apparently absent from Te Moehau, and exists otherwise only as planted specimens on the summit of Te Aroha (near the TV transmitter), it would seem that Mt Pirongia is the current northern limit for this species in New Zealand.

* Recent research (Weiller 1996) has advocated the reinstatement of the monotypic genus *Androstoma*. However, until such time as the generic position of other New Zealand species of *Cyathodes* is satisfactorily resolved, I advocate the retention of *A. empetrifolia* within *Cyathodes* s.l.

† Vouchers of these taxa from other locations on the mountain are lodged in AK or CHR

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