Conclusions

Cyrtomium falcatum has become a threat to native biodiversity in countries as far apart as Croatia and New Zealand. In cultivation it has been described by Clement & Foster (1994) as a "garden thug". Is it time that the Japanese holly fern joins the ranks of the tuber ladder fern (*Nephrolepis cordifolia*) by being added to the National Pest Plant Accord?

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The finding of the orchid, *Danhatchia australis*

The most significant discovery in the history of Auckland Botanical Society

Maureen Young

A subalpine plant, *Hebe societatis* ("of the society"), has been named in honour of the Nelson Botanical Society, whose members discovered this species on Mt Murchison in February 2000 (Bayly & Kellow 2006). This is the only plant in the New Zealand flora to be named for one of the country's botanical societies, but I wonder how many of our members are aware of the fascinating story of the discovery of *Danhatchia australis,* a monotypic endemic orchid, on an Auckland Botanical Society (ABS) trip more than fifty years ago?

Danhatchia australis is an erect, non-green orchid that grows to c. 12 cm tall, with a network of fleshy rhizomes underground. In December and January reddish-pink stems appear, bearing several pale bracts, and up to 5 white tipped flowers. These flowers seldom open, and then only slightly. The colour of the whole is reminiscent of the brown, pink and white of a mushroom, and so is very hard to see growing, as it usually does, among taraire (*Beilschmiedia tarairi*) litter. Occasional chloroplasts occur along the midribs of the leaf bracts, suggesting that the orchid was once an ordinary green-leafed plant which has since degenerated into its present dependent condition (Ross Beever pers. comm. to ED (Dan) Hatch). As it mostly lacks chlorophyll it can flower without the benefit of light, and the plants can sometimes be found happily growing under a fallen nikau (*Rhopalostylis sapida*) frond.

In January 1955 the summer ABS camp was held at Waipoua Forest. One of the participants on that trip was a keen member, Katherine Knight. Kath had studied botany at Auckland University College in the 1930s, and had retained her enthusiasm for the subject. On this occasion she had brought along four teenagers – her 17 year old daughter, Judy (Fig. 1), Judy's school friend, Elizabeth Kulka (Fig. 1), and two boys who were family friends (Judy Simpson, pers. comm.). The adventurous young people had struck off by themselves one day, following the Waipoua River upstream from a tumble-down bridge a couple of miles from the coast, and heading towards the forestry headquarters. Most of the time they walked in the river, but where there were deep pools, or where the bush was not very dense, they walked up on the bank. There, not far from the riverbank, and underneath an "old man taraire", the sharp-eyed Elizabeth spied a single, nondescript reddish stalk supporting several white flowers. The lack of green colouring made her think it might be parasitic, but she could see no obvious connection to any other plant: her curiosity led her to pop the plant in her pocket (Kulka 1955).

Fig. 1. Elizabeth Kulka (left) and Judy Knight (right) (1955).

Later, through connections with older siblings and friends in the Auckland University Field Club, this withered scrap of vegetation found its way to the university. A Field Club member, Colwyn Trevarthen, suspecting it to be an orchid, passed it on to Dan Hatch, who was well established, then as now, as the orchid expert.

Dan could make little of the specimen which had suffered from being passed through many hands, and his enquiries of Elizabeth brought only a map and a description of where she had found it. In the September 1955 issue of the ABS Newsletter he noted and illustrated what he called the "Waipoua orchid" (Fig. 2), and in the 1959 ABS Bulletin, *Auckland's Orchids,* the illustration appeared again, together with a note - "No more has been heard of this plant and I still treasure the solitary specimen in the hope of finding it myself or having living plants sent to me."

It took eight years from the original discovery for Dan's wish to come true. On Christmas Eve 1962 another teenager, schoolboy Ross Beever, along with his father James (also a keen Bot Soc member), was exploring in Mt Auckland/Atuanui, the reserve that bordered his Brunskill grandparent's farm at Glorit. There, again in taraire litter, he came across the orchid, and recognising it as possibly the long desired "Waipoua orchid" they took a specimen. This collection, dug up as a soil block with some of the rhizome, was placed in an aluminium strawberry pottle and kept on a sideboard for a couple of weeks until the Beevers returned to Auckland. Family recollections have it that Granny nearly threw it out! On their return, the orchid was taken to the Auckland Museum. Botanist Bob Cooper did not think it was the "Waipoua orchid", but rang up Dan, who came up from work, perhaps in his lunch hour, and confirmed that indeed that was what it was.

This provided fresh material for Dan, and allowed him to describe it (Hatch 1963). The orchid had many puzzling features, but was put in the "holding" genus of *Yoania,* as *Yoania australis*, with the nearest relatives being in Japan and Formosa. Thus Mt Auckland became the type locality – i.e. the location of the plant on which the description associated with the original publication of the name, was based.

Fig. 2. The "Waipoua Orchid". The first picture of *Danhatchia australis*, drawn from a dried specimen. From "Auckland's Orchids" by Edwin Hatch, Auckland Botanical Society Bulletin, April 1959.

In March 1964 the Beevers went on the ABS Canterbury trip, and in preparation Ross and Jim made a live collection of *Yoania* and gave it in person to Lucy Moore, Botany Division DSIR, Lincoln, Canterbury. Lucy was working on Volume II of the Flora of New Zealand, the volume concerned with monocotyledons (excepting grasses), and including orchids. So she was able to include *Yoania australis* in the new Flora, finely illustrated by J.B. (Bruce) Irwin, and the visit set Ross on course for his future career.

From this point onwards more discoveries were made. On 27 December 1966 John Horsman (Editor of the ABS Newsletter) searched for, and found, *Y. australis* in Kirk's Bush, Papakura (Horsman 1967). Three weeks later he revisited this taraire bush, in the company of Dan Hatch and Jim Beever, and they saw 45 stems in among newspapers, chocolate wrappers, old beer bottles and associated clutter. In an article entitled "*Yoania* among the beer bottles", Dan thought that the orchid had enough to cope with, what with bottle parties, courting couples and boys on bicycles (Hatch 1967). That same summer Lucy Moore's niece, schoolgirl Leonie Moore, found plants on the hill behind the local hall at Kaukapakapa, and the following summer she found more a couple of miles away at Whakatiwai Reserve (Leonie Clunie pers. comm.).

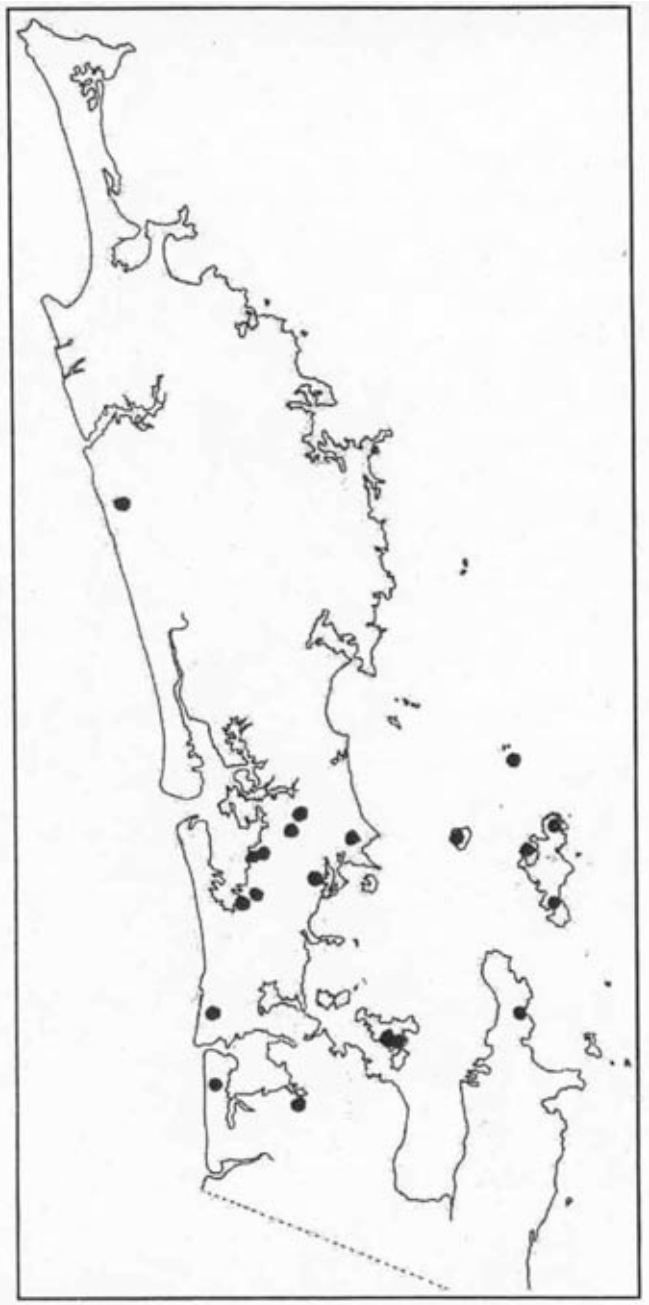

Fig. 3. Distribution of *Danhatchia australis* in New Zealand north of c. lat 37° 15', based on specimens in AK & CHR, and from personal communications.

My connection with the orchid began in January 1985. Lucy Moore, known to me in my childhood as "Auntie Lucy", had retired to Warkworth, and through her my old friend Frank Hudson and I had joined Bot Soc. Lucy had told us the story of *Yoania*, and as we lived right on the doorstep of the type locality, Frank and I determined that we were going to find it. That summer we searched through acres of taraire forest. We didn't locate it on Mt Auckland (though I saw it there many years later), but did see it in a patch of privately owned bush at Glorit, a couple of kilometres from Mt Auckland, after following "Beever" directions. Frank was disappointed that we found none on his farm at Kaipara Flats, but it was present in his neighbour's bush just over the back boundary. A third plot at Wayby, where the Waitaraire Stream meets the Hoteo River, completed that summer's records. By dint of "off-road" driving we managed to get an ailing Lucy (with Bruce Irwin) to all three sites. "I'm botanising in spite of myself", she grumbled. In later years we found it in McElroys Reserve on the Mahurangi River, and on Mt Tamahunga, near Leigh. This area of lower Northland, together with the Hauraki Gulf islands (particularly Great Barrier Island), seems to be the stronghold for the orchid (Table 3).

The connection with taraire seemed to be so strong that Dan had placed it in a sub-genus, *Tarairea*, and Ella Campbell (1970) considered it to be parasitic on a puff-ball fungus which grows in mycorrhizal association with taraire. Thus it was a real surprise when, in 1984, the orchid was found in north-west Nelson, where taraire does not grow. I saw it growing there in January 1999 around Kaihoka Lake, on the north side of the Whanganui Inlet. It looked strange to see it growing in almost pure sand, and out in the bright sunlight instead of in shady taraire forest. There was much nikau growing nearby, and as nikau has always been present where I have seen it, it seems that the fungus can also be associated with that (NZPCN website).

Dan's suspicion that the orchid did not belong in the genus *Yoania* was justified when Garay and Christenson (1995) erected a new genus, *Danhatchia*, to accommodate what is now considered to be not only an endemic, but also a monotypic orchid. Thus Dan's name has been honoured for his more than sixty year's work on New Zealand's orchids.

For those of us "in the know" about *Danhatchia*, there is an irresistible urge during the summer months to scuff around in taraire litter, and when one sees a fellow sufferer acting in this manner, it is instantly obvious what afflicts them. A typical case of this was when a small party of Bot Soccers were on Motu Kaikoura, Port Fitzroy Harbour, in December 2006. When I met up with Ewen Cameron and Tricia Aspin in Taraire Valley Ewen said, "Guess what Tricia's found?" I didn't answer, but scratched around, muttering, "*Danhatchia* should be here." "That's what she's found," he replied.

Table 1. List of localities where *Danhatchia australis* has been found.

Only the first record has been given, with voucher numbers where applicable (see also Fig. 3).

Voucher #	Locality	Collector (or reference)	Date
AK 185189	Waipoua River	E. Kulka	28 January 1955
AK 108768	Mt Auckland/Atuanui	R.E. & J. Beever	24 December 1962
AK 163375	Kirks Bush, Papakura	J. Horsman	21 January 1967
CHR 174888	Kaukapakapa	L.H. Moore	18 February 1967
	Whakatiwai, Kaukapakapa	L.H. Moore (L.H. Clunie pers. comm.)	January 1968
CHR 259916	Karekare, Waitakere	R.E. & J. Beever	15 December 1973
AK 156545	Taiharuru Bay, Coromandel	J. Smith-Dodsworth	10 January 1982
AK 271448	Rangiwhakaea Bay, GB Island	A. Grace	3 January 1983
	Kaihoka Lake, NW Nelson	N. Smart (Horsley 1989)	January 1984
CHR 511581	Near Tryphena, GB Island	R.E. Beever	6 January 1984
	Farm Remnant, Glorit	M.E. Young & F.P. Hudson (M.E. Young pers. comm.)	29 December 1985
AK 172970	Kaipara Flats	M.E. Young & F.P. Hudson	5 January 1986
AK 172969	Wayby, Waitaraire Stream	M.E. Young & F.P. Hudson	12 January 1986
AK 229255	Te Matuku Bay, Waiheke Island	R.E. Beever	27 January 1994
AK 234325	Mokohinau Islands (Fanal Id.)	P.J. de Lange & D.A. Norton	7 December 1997
AK 234356	Mt Pirongia	P.J. de Lange	14 December 1997
AK 246921	McElroys Reserve, Mahurangi	P.J. de Lange & ME Young	21 December 1999
AK 246920	Matakawau, Awhitu Peninsula	P.J. de Lange	22 December 1999
AK 281848	Mt Tamahunga, Leigh	M.E. Young	29 December 2001
AK 286236	Little Barrier Island	P.J. de Lange	10 November 2001
AK 280127	Opopo Bay, Waiheke Island	H.A. Cox & C.D. Kilgour	December 2002
	Motu Kaikoura, Fitzroy Harbour	P.A. Aspin (Cameron 2007)	18 December 2006

Some interesting points about these records:-
Three of the first four discoveries were made by youngsters still at school, youngsters with keen eyesight and enquiring minds.
All these North Island records were by members of the ABS, or were found on ABS trips.
The orchid has never been found again in Waipoua Forest, and only one site has been recorded at Coromandel Peninsula, Awhitu Peninsula and Mt Pirongia. Apart from the NW Nelson records, the rest are all from Lower Northland and the Gulf Islands. One wonders if this is a true indication of distribution, or is it just that our members are alert to this orchid, and those areas are our stamping grounds?

The last word belongs to Elizabeth Kulka, now known as Maru Bing (pers. comm.):

"Young people profit from a supportive environment. If the Field Club members Colwyn Trevarthen (now professor of psychology at Edinburgh University), Richard Kulka (now professor of biochemistry at the Hebrew University, Jerusalem, Israel), Rod Bieleski (formerly plant physiologist at DSIR and 9 years as a DSIR Director) and Jane Trevarthen (researcher in the USA) and others, each of whom had a prodigious knowledge of the New Zealand flora and fauna, had not passed on to the slightly younger generation (siblings and their friends) their interest in searching for specimens and naming them, this specimen would not have been handed over to thoughtful minds. The clubs such as the University Field Club with its publication "Tane", and the Botanical Society, were supported by lecturers and experts who were generous with their time. A special culture of biological understanding sprang from these groups, and without support from this source the shrivelled specimen from the Waipoua Forest would, in 1955, have ended up in the dustbin."

Fig. 4. *Danhatchia australis* (as *Yoania australis*) from Kirks Bush, Papakura, 1967, painted by Audrey Eagle. In those early days it was not known that the flowers do not open widely, but in fact barely open at all. In the over forty years that Audrey was painting the pictures for her *Complete Trees and Shrubs of New Zealand* she was supplied with specimens by people from all over the country, but she is proud of the fact that in her early years of artistic endeavour she managed to find this elusive orchid without help from others.

Fig. 5. a-c. *Danhatchia australis* with its flowers partly open, taraire forest, Rangiwhakaea Bay, NE Great Barrier Island, 4 Jan 1983 (Ewen Cameron)

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I'm indebted to the people who patiently corresponded with me on this subject by email, mail or phone – Ross Beever, Rod Bieleski, Maru Bing, Leonie Clunie, Judy Simpson, John Smith-Dodsworth and most of all, Dan Hatch; to Audrey Eagle for searching through her old records for her painting of *Yoania australis*, and for permission to reproduce it here; to the staff of the Landcare Research Herbarium (CHR) and Auckland Museum Herbarium (AK) for sending me the records of their holdings of *Danhatchia australis*; to Ross Beever, Ewen Cameron & Dan Hatch for commenting on drafts of this article and Ewen for photographs of *Danhatchia australis*.

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Sex in the city: flowers and fruit of titoki (*Alectryon excelsus*, Sapindaceae)

Rhys Gardner

Titoki has been planted along many of the streets in the vicinity of Auckland's Eden Park. Sturdy and tough-wooded, these trees resist drought and rugby crowds alike, and it hardly seems mere sentiment to regard them as constituting the domesticated fringe of the natural titoki forest not far away on the lava flows at Gribblehurst Park.

Most relevant though for this article is that these trees are exceptionally accessible for study. They flower well (including near the ends of their lower branches) and each tree has a more or less unique address, convenient should follow-up work be needed.

Most books say that titoki has two genders: one with male flowers (shrunken ovary and stigma, long stamens), the other with seemingly bisexual flowers (plumose stigma, stamens short but anthers well-formed and with pollen). These are shown in Fig. 1 (a, b). Duguid (1961) however, wrote of a tree she observed for some years that bore both kinds of flower (and was, apparently, self-fertile).

Shortly after New Year's Day 2008, when flowering of the Mt Eden trees had advanced to where the developing fruits were large enough to be detected even high in the crown, I surveyed the gender of 111 of these trees. This was partly with Duguid's