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Kangaroo grass (*Themeda triandra*) on Browns Island, Hauraki Gulf

Mike D. Wilcox

Kangaroo grass (*Themeda triandra* Forrsk., syn. of *Themeda australis* (R.Br.) Stapf), is native to Australia, Africa, Asia and the Pacific. It is very common and widespread in Australia, where it thrives best where there is little or no grazing. It is tolerant of fire.

Fig. 1. *Themeda triandra*, Browns Island (Mike Wilcox, 20 Dec 2007).

On 20 December 2007 when visiting Browns Island with Ranger Steve Benham of the Department of Conservation I found a patch of kangaroo grass on the northern slopes just below the summit. The dominant grass there and over much of the island is tall oat grass (*Arrenatherum elatius*). The plants of kangaroo grass, numbering 20 or so individual clumps, stood out with their bronzy-reddish colour, and large, long-awned flower heads.
A sample was collected from Browns Island from a patch of numerous plants near the summit (AK 301455).

Edgar & Connor (2000) record *Themeda triandra* from several places in the South Island, and in the North Island from Rangitikei and Auckland City (early record only). The Auckland record is by T.F. Cheeseman, with numerous samples collected from St Johns College, Purewa, 1870s and 1880s. Thus, the recent collection from Browns Island seems to be the first for at least 130 years from the Auckland region.

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Japanese Holly Fern Invader - *Cyrtomium falcatum* (L.f.) C.Presl

Steve Benham

Background

New Zealand has a very rich and diverse native fern flora with over 194 indigenous species of which 89 species are endemic (Brownsey and Smith-Dodsworth 2000). With such favourable conditions for these pteridophytes it is hardly surprising that there are currently at least another 32 species that have become adventive and naturalised here. A few familiar fern adventives that spring to mind and all too often to be found in and around the Auckland Region are the ubiquitous tuber ladder fern (*Nephrolepis cordifolia*), royal fern (*Osmunda regalis*), Cretan brake (*Pteris cretica*), the two maidenhairs *Adiantum capillus-veneris* and *Adiantum raddianum*, and ferny azolla (*Azolla pinnata*).

Another invader to New Zealand and elsewhere in the world is the Japanese holly fern also widely known as the Asiatic holly fern (*Cyrtomium falcatum*). This species is indigenous to Japan, Korea, India, Vietnam and China. Japanese holly fern has been familiar to me since my botanical training, 40 years ago in England, where we grew it as a very tolerant pot plant under cold glasshouse conditions. This species is still grown today for sale throughout Europe as a houseplant. In Auckland it is freely available and sold as a hardy outdoor fern through garden retail centres.

Etymology

Cyrtomium from Greek arch alluding to the pattern of netted veins, *falcatum* Latin from falx, falcis, sickle "like a small sickle" alluding to the pinnae shape.

Morphology
Cyrtomium falcatum is a rhizomatous species with dark green shiny oblong-lanceolate evergreen, leathery, glabrous blades. Individual fronds can reach 950mm high by 250mm wide, the stipe is well-clothed in ovate-shaped orange-brown scales. The pinnae are 4-12 paired, margins often undulate or irregularly dentate; veins netted. The conspicuous orbicular sori are found spread over the entire lower surface of the pinnae. The indusium is persistent, peltate and brown in colour.

Naturalisations in the Auckland Region
Webb et al 1998 indicate that the first known records of naturalisation occurred in Auckland City and South Auckland (Hamilton and Coromandel) in 1981. The current Auckland Regional Pest Management Strategy 2002-2007 does not restrict this species from propagation or sale. The earliest known naturalisation for the Auckland Region was a specimen collected by P. Hynes in December 1952 from a cliff face at St. Heliers (AK 30493). It would be good to check the Hynes site and see whether it is still there.

At the Auckland Museum herbarium (AK) there have been 10 voucher specimens lodged since the year 2000 from around Auckland, as far west as the Awhitu Peninsula and east to Maungauika / North Head and Motuihe Island and as far north as Spirits Bay. Earlier records dating from the 1990's come from Mt.Eden, Forrest Hill, Takapuna, Bucklands Beach, Onehunga and Karioitahi Beach.

This species appears to like mortar from old brick and stonewalls. On Motuihe it was originally recorded (AK 284744) and controlled in 2004 by J. Boow and P.M. Brown, from an area littered with mortar rubble. In July 2007 Helen Lindsay and the author revisited this site and noted eighteen plants of which two were fertile. From a distance Japanese holly fern could quite easily be mistaken for our native huruhuruwhenua / shining spleenwort (*Asplenium oblongifolium*) as both have shiny pinnate pinnae.

At North Head Historic Reserve it was recorded as growing out of the seawall along the Eastern Coastal Walkway (P. Brown pers. comm. 2007). In the vicinity of horticultural plantings of *C. falcatum* at the Auckland Botanic Gardens, Manurewa there are signs that it has naturalised in close proximity to the parent plants (pers. ob.).
With this evidence of naturalisations occurring in the Northland and Auckland regions it is definitely a species that will require ongoing careful monitoring as it has the potential to displace native biodiversity. Gardeners should be dissuaded from cultivating this exotic fern.

Naturalisations overseas
Rhys Gardner collected AK 190020 from Norfolk Island in October 1989. There is a cultivar listed as *C. falcatum* 'Rochfordianum', which has pronounced sharply toothed pinna margins and very irregular apical pinna, that has been observed as naturalised on Lord Howe Island and Norfolk Island (the latter record as *Phanerophlebia falcata* (Green 1994)). In mainland Australia there are numerous naturalisation records for Japanese holly fern in south-eastern South Australia, south-eastern Queensland, N.S.W. and north-eastern Victoria (Green 1994) and Western Australia (Coleman 1998).

Further afield an early record dating from 1928 appears in Hawaii from the cliffs above Kalaupapa on Moloka'i (GRIN). In the Hawaiian archipelago it is now found on all major islands on damp windward sea cliffs except Kauai and is regarded as a major environmental weed.

Europe has seen many incursions, with plants naturalising in the Channel Islands, Isles of Scilly, Kent, western Scotland and County of Cork where it commonly occurs on walls and coastal rocks in the shade (Clement et al 1994). Naturalisation records in the Netherlands date from 1915 to the present but populations have fluctuated in response to severe winter conditions (Denters 2003). Plants are now showing up in Belgium with the warmer winter temperatures and it is recorded as occurring and surviving for the past decade in the town of Rab which is on the island of the same name (Denters 2003).

In the U.S.A it has naturalised in the moist cliffs, banks and crevices of the Joaguin Valley as well as coastal California (GRIN). Alabama, Florida, Georgia, Louisiana, Texas, Virginia have all been invaded as well as one location in the State of New York. In Florida and the deep south it has been a popular porch plant since the 1800's (GRIN).

History has shown us that fern adventives are notoriously difficult to control due to their large numbers of spore and ease of dispersal. Taking into consideration the fact that Japanese holly fern has naturalised through the eastern seaboard of Australia - does this pose the question of whether spores are arriving on our west coast cliffs in thermal air currents from the Australian continent?

There is international evidence to suggest that this species is unpalatable to browsing animals. Bec Stanley observed it at Irwins Gap on the Awhitu Peninsular (AK 300391) where it occurred in abundance along a 15m stretch in association with *Tetragonia implexicoma* and *Apium prostratum.* Bec reports 'It looked perfect - no browse at all. Have to say though it was on a steep sandy cliff (consolidated) and the cattle had access only to base.' (pers. comm. Bec Stanley Oct 2007).

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).