

Waterfall Floras of the North

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Introduction

Reading through Allan Cunningham's "Precursor", northern New Zealand's first great species-list, I found myself imagining that whenever Cunningham got sick of fernland, swamp and forest he would go to find refreshment and good botany at the region's waterfalls: "170. *Schizaea dichotoma* Great Fall of the Keri-Keri River, 214. *Lindsaea trichomanoides* near the Falls of the Wytangy, 308. *Libertia micrantha* on humid rocky banks of the Keri-Keri River, below the Falls, 381. *Veronica diosmifolia* at the fall of the Keri-Keri River, 419. *Gaultheria fluvialis* in the pebbly bed of the Keri-Keri River near the Great Fall" (Cunningham 1837-40).

Most members of this "waterfall flora" need moisture and coolness, and, since waterfalls are suitably long-lived geological features, may well have enjoyed such conditions in the north since the last Glacial at least. Others have the opposite requirements - "native weeds", needing open dryish habitats and hardly able to compete with modern exotics, they now have a very sporadic northern distribution, e.g. *Myosotis* spp. Still others are rheophytes, that is, strong-rooted perennials most competitive in the flood-zone, our classic example being of course *Gnaphalium keriense* (now *Anaphalioides trinervis*).

Waterfalls in time and space are "attractors" for all these types of plant. Also in my list below are a few other species which, though not especially waterfall-plants, are sufficiently uncommon as to be worth noting. Northern New Zealand's diversity of geology - what to a botanist seems a disordered agglomeration of various pieces of hill country - is well suited to the formation of waterfalls, and no doubt there are some that as yet have not been memorialized by an interesting specimen or two.

The major northern waterfalls are:

Rainbow Falls, 35° 13' 173° 56'. These are situated on the Kerikeri River, 2.5 km from the coast. They would be Cunningham's "Great Falls". The historian and author Nola Easdale appreciated how much a feature of life in early Kerikeri the waterfalls were and devoted a chapter of her book to them (Easdale 1991). She mentions that not only Cunningham but also Thomas Huxley and Joseph Hooker visited the Rainbow Falls, which were then known by their Maori name, Waianiwaniwa.

She says that another waterfall at a little distance from the mouth of the Kerikeri River was in the early days known as the Kerikeri Falls; it had a small wood, Wharepuke, on its northern side, important because it furnished the only convenient source of timber for the mission station; by the 1930s this fall had acquired the name Wharepoke (sic).

Her map shows three falls: a "low waterfall" opposite the Kemp House and Stone Store, Wharepoke Falls upstream, and Waianiwaniwa Falls further up above the junction with the Puketotara Stream. She also reproduces an early French map of the Kerikeri Inlet, compiled from the Duperrey visit of 1824 and the Dumont D'Urville visit in 1826-7. It features three falls; I cannot read the legend for the Waianiwaniwa ("Cascade de Fanafanoa" ?).

Waitangi Rvr Falls/Haruru Falls 35° 17' S 174° 03' E

Whangarei Falls 35° 41' S 174° 20' E These are situated on the Mangakino Stream.

Wairua Falls 35° 45' S 174° 05' E These are situated on the Wairua River.

Mangere Falls 35° 42' S 174° 08' E These are situated on the Mangere River, a tributary of the Wairua. Possibly spelt "Mangare" at times.

Waitakere Falls These are located where the face of the Waitakere Reservoir dam now is. Cheeseman (1871: 272) describes them (though not by name) as being upward of 200 feet high, located on the Waitakere River "where it descends abruptly from the 800-1000' a.s.l. level".

Hunua Falls 37° 04' S 175° 06' E. Kirk called this locality "Wairoa Falls", sometimes adding "Hunua", and early collectors would refer to the river as the "Southern Wairoa" to distinguish it from the "Northern Wairoa" on the Kaipara. Some 4-5 km downriver beyond the Hunua Falls the Wairoa runs through something of a gorge and here there are some small rapids; there also used to be a falls on a side stream c. 3 km north of Hunua Falls. I mention these because the gazetteer of Dollimore (1957) states that below the Hunua Falls there are the "Black Falls" and the "Lily Falls". I do not know where exactly these are, nor have I seen any specimens so labelled.

The flora

The following list is made from AK specimens only.

Ferns

Hymenophyllum atrovirens A recent northern collection of this rheophyte was made by Peter Bellingham in 1984 from a gorge in the Waipapa River, Puketi Forest "on a rocky bank, its fronds trailing in the river".

Lindsaea viridis Cheeseman (1914) described this fern as "invariably found by the sides of streams, either pendulous from the wet rocks of waterfalls or dripping cliffs, or growing erect on the mossy surface of shelving rocks flanking swiftly flowing

streams", and the AK specimen illustrated in that work is one of his from "Henderson's Creek". Anthony Wright and Alix Court collected it from perhaps more or less the same site in 1975, from Opanuku Stream at the foot of Sharp's Bush.

In AK there is an *Lindsaea viridis* specimen collected by Carse from Mauku, without habitat details. I had thought that this might be from the basaltic falls at that locality, but in his paper on the flora of the district Carse (1902) lists the species only as having been found "on stems of ferns [presumably, treeferns], not common". There is no other AK material from such a habitat, but Carse's specimen does seem to be correctly identified.

Loxsonia cunninghamii Often seen along forest streams, usually on shaded and fairly stable alluvial banks though not restricted to such places. Peter Bellingham collected it in 1984 from the banks of the Otangaroa Stream, Herekino Forest "next to a long waterfall".

Ophioglossum coriaceum This elusive grassland plant was found in 1989 by Anthony Wright at Miner's Cove, Great Barrier Island "on moss-covered rock at the top of a small waterfall".

Sticherus flabellatus Habitat as for *Loxsonia*. Lucy Moore with Kew botanist Ronald Melville found it in 1961 at "Kerikeri Falls among basalt boulders along the river bank below the falls".

Herbs

Callitriche petriei I found this in 1983 at the Whangarei Falls "in loose cushions at pool edges at top of falls, with *Monoclea* and *Epilobium nerteroides*". It is quite common at the Hunua Falls, on the eastern side of the plunge pool.

Crassula hunua The Hunua Falls is one of the original localities for the species, and it can still be found here in some abundance especially among wet rocks on the plunge pool's shaded eastern side, where weeds are less prevalent. It grows in lesser quantity on the rocky rapids further down the Wairoa River, with *Glossostigma elatinoides* and *Gnaphalium involucreatum*.

Epilobium nerteroides This is one of the better competitors among our native herbs and should be looked for on any waterfall north of Auckland. It is still present in some frequency around Auckland, though mistflower and pampas grass may soon change that if they have not done so already.

Epilobium pedunculatum In 1997 Ewen Cameron made the first collection of this for the Waitakeres, at Whatipu Stream "on a rocky bank, with *E. nerteroides*, *E. rotundifolium* and *Anaphalis keriensis*". I found it at Coatesville Scenic Reserve in 1978 "creeping on rocky rapids, with *Epilobium rotundifolium*".

Epilobium pubens Unlike the previous two species this plant prefers dryish or at least well-drained, open sites. Peter Bellingham found it in 1985 at a tributary of the Mangakahia River, Hokianga "on a large boulder in stream bed below a major waterfall".

Carse got *E. pubens* from "Waima Falls" in 1897. I cannot place this locality; perhaps it is Falls Creek on the northern face of the Waima Range.

Gunnera monoica There is an undated Kirk collection in AK from "Wairoa Falls", and from the Waitakeres, a unlocated collection of Cheeseman and a more recent one from Huia. And, as we saw in the Bot. Soc. September 2000 trip, it flourishes on the cool and damp rapids of Paremoremo Creek. Carl Skottsberg and Lucy Cranwell collected the species in 1938 from "Riverhead, near sea level", which just possibly is the Paremoremo site.

Gunnera prorepens Another undated Kirk collection is of this species from "Wairoa Falls, Hunua" (AK 11481); like *G. monoica* it has not been rediscovered there.

Hydrocotyle hydrophila The northern limit for this species is the Hunua Falls. Ewen Cameron collected it from here in 1994 "on rocks in the spray zone at the eastern edge of the plunge pool".

Hydrocotyle microphylla This also grows at the Hunua Falls (ROG, 1985). The northern limit of the species is not clear but there are no AK collections from the northern waterfalls.

Leptinella tenella Around Auckland this little daisy, iconic shy native, can be seen on mossy damp mudstone at a waterfall on the coast at Hillsborough. It also grows at the Oteha Stream, Albany, on the long sequence of shady low rapids west of the bridge and shopping area. (The waterfall to the east of the bridge is overgrown with weeds - its restoration would be a worthwhile project).

Myosotis forsteri Cheeseman collected a single individual of this from the Waitakeri Falls in 1882.

Oxalis magellanica This is relatively well represented among "northern southerners", for example, it was collected by Ewen Cameron in 1995 from Wainiwha Creek, Whangaroa Harbour "on bare rock by base of waterfall". Michael Hodgkins found it in 1930 at Huia "near outlet of stream", and it is still present in abundance at the Hunua Falls, among the plunge pool rocks and also in damp open turf under kanuka near the top of the falls.

Rorippa divaricata R. H. Matthews and Carse found this at "Wairua Fall, Whangarei" in 1899. There is no subsequent AK collection from the region, where the species is now restricted to offshore islands.

Rorippa palustris Peter de Lange and Lisa Forester found this in 1994 from "Wairua Falls No. 1", 35° 41' S 174° 08 E, where it was "occasional on basalt columns on the partially dry river bed".

Viola filicaulis There are a number of modern northern collections of this in AK, from seepages and streams and shady banks in forest. Cheeseman got the only AK Waitakere Range collection from "Nihotupu River".

Dicot trees & shrubs

Hebe acutiflora This was one of Alan Cunningham's finds from the "Kerikeri Falls", though not mentioned in the "Precursor". It is perhaps a rheophytic variant of *H. ligustrifolia* (P. J. de Lange, pers. comm.).

Hebe diosmifolia This northern endemic was collected by Carse in 1897 and 1898 from Mangere Falls. There are no subsequent collections from here in AK, but in 1997 Mike McGlynn got it some 30 km northwards on the Waiariki River, a tributary of the Mangere River, "on river bank with large boulders".

Monocots

Arthropodium candidum Another shy native and apparently one exceedingly rare in northern NZ, this was obtained by Anthony Wright in 1983, at Rangiwahakaea Bay on Great Barrier Island "at the mouth of Waterfall Stream".

Chionochloa conspicua subsp. cunninghamii Cunningham listed this robust tussock as "254. *Agrostis pilosa* shady woods on the Keri-Keri River". Apart from a collection of Cheeseman from "Whangarei" it is represented in AK for Northland only by a collection made by Peter Bellingham and Karen Riddell in 1996, at the Waipapa River in Puketi Forest "on steep banks of the river above the usual flood channel but below the woody plants".

References

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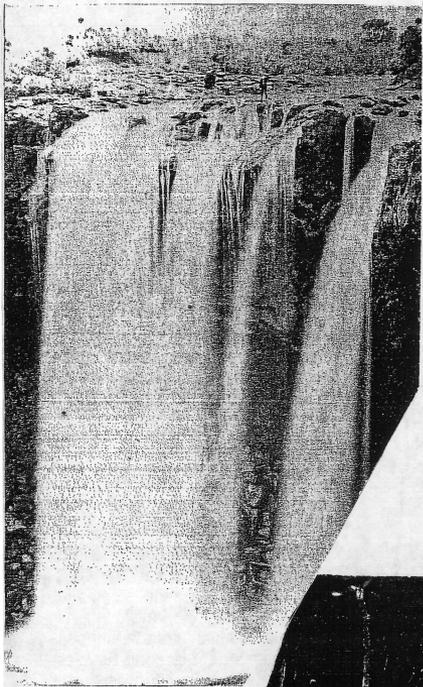
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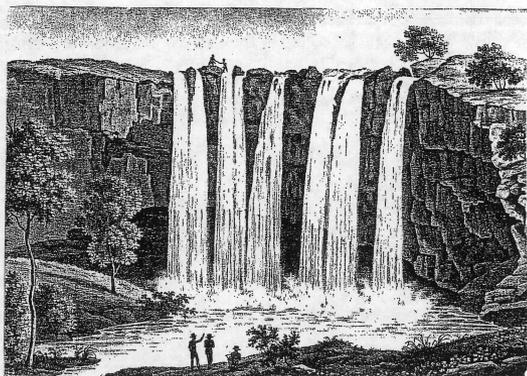
Figure 1.

- A. "John Kinder photographed the Waianiwi Falls, under the title of 'Kerikeri Falls', some time in the 1860s" (Easdale 1991: 144).**
- B. "This early depiction of the Waianiwi Falls is based on a sketch by Jules Le Jeune done in 1824 ... " (Easdale 1991: 147).**
- C. *Corybas rivularis*. Stereo-pair. Specimen photographed by Eric Scanlen in the Maungataniwha Range, 8 Nov. 1999. The flower is c. 1 cm deep (left to right) and the "whiskers" are c. 3 cm long.**

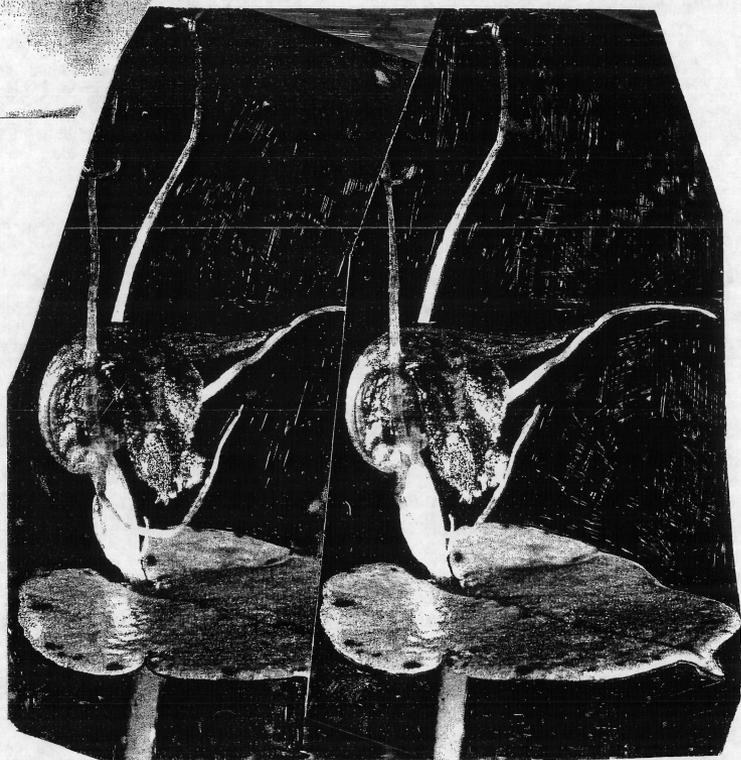




A



B



C