removal by blanching in boiling water before the leaf is suitable for human consumption. It retains a good volume and firmish texture after cooking, and has a mild flavour improved with salt and pepper and a little butter.

Both the Mangere colonies are still hanging on, and the one on Mangere Bridge has survived a dunking by a weed- spraying gang. It is evidently a perennial here - not an annual as indicated in some references (e.g. Prakash 1967). Other records I know about (with help from Graeme Hambly, Maureen Young, Steve Benham and Rhys Gardner) of New Zealand spinach in the wild are the Kermadec Islands (Sykes 1977), Kohuora Crater (Papatoetoe), Duck Creek (Manukau Harbour), Wood Bay, Rangitoto Island, Stanmore Bay, Clark's Beach, Big Manly, Scott's Landing (Mahurangi), Horseshoe Island in Whangateau Harbour (Asquith, Hambly & Young 2001), and Mangawhai Harbour.

New Zealand spinach is indigenous not only to New Zealand and Australia but is also found naturally in Norfolk Island, Lord Howe Island, New Caledonia, Tonga, China, Japan, and the western coast of South America (Prakash 1967; Whistler 1992; Green 1994). In Australia it is primarily a coastal plant, but it also occurs inland on salty soils in the Murray-Darling catchment (Gray 1997). It is considered an agricultural weed in parts of Queensland. The dry horny fruits float in water, and can remain viable for more than a month in salt water. The species is thus likely to have been dispersed by sea. It is reported to be adventive in California, Oregon, the Azores, and Portugal, and to be sometimes grown as a vegetable in Europe (Phillips & Rix 1995).

In contrast, the beach spinach (*Tetragonia implexicoma* (Miq.) Hook. f., syn. *Tetragonia trigyna* Banks & Sol. ex Hook.f.) is commonly encountered on shaded sea cliffs and under pines on the Auckland west coast. Beach spinach is widely distributed in coastal New Zealand, and is also native to Norfolk Island and southern coastal Australia. It was originally described in 1864 as *Tetragonia trigyna*, but is now considered to be identical to *T. implexicoma*, described in 1856 from Australia (Green 1994). It can become a sprawling semi-woody liane, and is also edible. The leaves are considerably smaller than in New Zealand spinach, and the ripe fruits differ in being red and fleshy.

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Bryophyte Field Trip to Rangitoto Island

Matt Renner

On 21 July 2001, 21 people gathered on what was a brisk day threatening rain, to appreciate the Bryophyte flora of an island, which not only is renown for being hot and dry during summer, but also where movement on hands and knees is nigh impossible. Our leader, John Braggins, who had not been to the island since immediately after the eradication of browsing mammals (possums & wallabies), commented on the general health of several species, particularly *Asplenium oblongifolium.*

A surprisingly diverse array of bryophytes were observed on the island. The diversity of habitats present meant that completely different bryophyte communities, i.e. communities as disparate as those dominated by *Rhacomitrium prüinosum, Polytrichum juniperinum,* with the lichens *Cladina confusa* and *Cladia retopora,* resembling the herbfields dominated by the *same* suite of species in *alpine* regions, and communities typical of the interior of lowland forest, could be observed over the distance of a few metres, an ideal situation when the best method of observation involves movement on hands and knees, unfortunately Rangitoto is not that conducive to this sort of carry on.

The damp turf by the start of the summit track was the first place to be "done over", partly due to the earthy nature of the substrate, which facilitated serious investigation that revealed the presence of the tiny *Riccia croalsii,* and *Lethocolea pansa* (a new record to John Braggin's draft list). *Asterella australis* also grew in this region, complete with mushroom like archegoniophores (reproductive structures).

Forest interiors were dominated by the liverworts *Plagiochila obscura,* and *Chiloscyphus semiteres,* with the mosses *Dicranoloma billiardierei, Rhacopilum convalutaceum,* and *Bryum* spp. including *B. pyriforme.* Other lithophytic liverworts of the forest interior included *Radula* sp., *Heteroscyphus coalitus, Chiloscyphus ?subporosa,* and *Cuspidatula monodon.* The flora of the margins of the forest patches, particularly the southern margin, was perhaps the most interesting, the favourable combination of light

and (most of the time) moisture facilitating the extensive and lush growth of a range of species, including the mosses *Leptostomum inclinans* (growing lithophytically), the ubiquitous *Hypnum cupressiforme* and *Thuidium furfurosum*, with *Ptychomnion aciculare*, and *Campylopus introflexus*, and occasionally the striking *Pulchrinodus inflatus*, with the liverworts *Lepidolaena taylorii*, *Plagiochila gregaria*, *P. bazzanioides*, *P. fasciculata*, rarely *P. deltoidea*; (which was observed on Rangitoto for the first time on Saturday); *Jamesionella colorata*, and *Cuspidatula* again. Smaller liverworts of the forest edge that were seen on Saturday include *Cephaloziella* sp. aff. *pulcherrimum*, *Temnoma palmatum* s.lat., and *Lepidozia* sp. *indet* (all new records).

Bark provided *the* opportunity to observe a completely different suite of species. *Frullania squarrulosa*, *Mastigolejenuea (Tylimanthus) anguiformis*, and *Archilejuenea olivacea* were observed on the outer branches of pohutakawa. Unfortunately the bark was wet, which meant the smaller epiphytes, such as *Lejeunea*, and its allies, and smaller *Frullania* were obscured. However, in forest on the cinter cone, *Harpalejeunea latitans*, *Cheilolejeunea* sp. *Acrolejeunea* sp. *Lejeunea flava* and *Lejeunea* sp. were collected growing as epiphytes on the much larger *Porella elagantula*, itself epiphytic on *Myrsine australis*, just to illustrate the amazing variety of the tiny epiphytes that while there, could not be observed on the day. The epiphytes of low tree trunks tend to be utterly different to those growing in the relatively dry canopy, and this was again the case on Rangitoto. *Bazzania adnexa* var. *adnexa*, *B. hochstetterii* (new record), *Chiloscyphus* spp., and *Lepidozia* sp. being common in this habitat.

Being so frequently close to the ground also facilitated close observation of flowering *Pterostylis alobula* (abundant), *P. trullifolia* (few), and *Acianthus sinclairii* (abundant), as well as the filmy fern *Hymenophyllum cupressiforme.*

Surprisingly, most members of the trip were able to keep pace with John, who in certain circles has the reputation of being something of a whirlwind in the field, keeping pace with him requiring a firm grip of his coat-tails (we actually got to the Parade ground for lunch!). The day was also completed without too many grazes or scratches on the knees of the participants, including those of the writers, something of an achievement considering his reputation when it comes to liverworts and rocky habitats.

Rangitoto Island - 1866 Extent Of Vegetation, 1887 & 1913 Fires

Mike Butler

The following Rangitoto details are taken from early Auckland newspapers and may be of interest with regards to the debate over the historical vegetation cover of the island.

One school of thought is that Rangitoto Island had little vegetation cover in early times. However these accounts tend to support recent studies such as Andrea Julian's "The Vegetation Pattern of Rangitoto" (1992) Auckland University Thesis, that there were significant areas of shrub-land from the earliest times.

The 1887 fire may explain the current prevalence of manuka/kanuka on the eastern slopes of Rangitoto Island.

"...Beyond appears in bold relief, the three forest-clad peaks of Rangitoto..."
(Southern Cross June 24, 1843. Sales by Auction.)

"...Odd circular islets are on the right and left, while the island of Rangitoto, with its thickly timbered peaks, is the highest and chief object in view..."
(Daily Southern Cross June 27, 1864. To Auckland via Manukau.)

"...Other water-colours depict the signing of a duplicate of the Treaty of Waitangi, at the entrance to the Tamaki River, in 1840, and a panorama of Auckland Harbour, from Rangitoto, painted in 1841 by Colonel B(un)b(e)ry, of the 80th Regiment. This is interesting as being the first record of an ascent of Rangitoto. Trees are shown growing in the crater, but these gradually disappeared, partly because it was a practice of early Aucklanders to light a fire to show their friends they had really reached a certain point..."
(N.Z. Herald November 10, 1909. Early Auckland.)

"A WEEK'S EXCURSION, NORTH AND WEST OF AUCKLAND By E. (*sic*)

Being desirous of ascertaining how much of the country could fairly be seen during a week's vacation, I left Auckland in a firewood boat, bound for Matakana, there being no steamer engaged on a pleasure trip, and took with me a blanket, some bacon, and some biscuit, with a tin can for boiling tea.
The cutter anchored under Rangitoto reef, there being rather a stiff, though fine "northerly buster," as the skipper called it, blowing "batt end foremost," with a sea that a ten-ton craft could make nothing against.
We therefore made all snug on board and landed on Rangitoto, taking with us a bottle of water and our dinners.
The appearance of Rangitoto from the beach is not encouraging to the excursionist. Go which way you will you find nothing but sharp scoria and rocky ledges without a trace of a path.