FERN CONSUMPTION IN AOTEAROA AND ITS OCEANIC PRECEDENTS

HELEN LEACH

University of Otago

Fern eating, in particular the consumption of bracken fern-roots, is perceived as a characteristic of Māori subsistence in Aotearoa, in contrast to the diets of Polynesians residing in the tropics. In 1925, Elsdon Best described how the abrupt change from tropical conditions forced early Māori to collect wild foods. Even when cultivation of kumara and taro was established, “it became necessary to still rely on fern root as the principal vegetable food supply in most districts” (Best 1976:21-22). The overall impression that bracken fern-root consumption was a Māori innovation went unchallenged, while later writers only debated the relative contributions of cultivated crops and bracken fern-root. This paper explores the Oceanic precedents of fern eating and considers whether our attention has been too narrowly focused on bracken fern-root to the neglect of the roles played by other fern species in Aotearoa. It will never be known exactly how many species were used. It is, however, worth reviewing early records to appreciate the range of species familiar to Māori and the relative importance of some of the key species.

EUROPEAN RECORDING OF MĀORI FERN USE AND NOMENCLATURE

The European perception that the rhizomes of the bracken fern (*Pteridium esculentum*) were the Māori equivalent of bread was formed during the first onshore encounters between the two peoples in 1769 (Leach 2001). The role of the bracken fern-root was certainly magnified by the season at which this first contact was made, i.e., spring and early summer when the sweet potato was unavailable. By visiting the drier eastern locations of the North Island first, the Endeavour’s botanists did not have the chance to see the extensive fern flora of western rain forests and could not compare how Māori used these species relative to bracken. Also, the role of bracken fern-root was assessed against the diet of another Polynesian culture encountered on the well-endowed tropical island, Tahiti, where cultivated tree and root crops provided most of the vegetable food.

The contrast between tropical Polynesia and temperate Aotearoa quickly led to a categorisation of Māori as bracken fern-root eaters, a dubious distinction in the eyes of Europeans who in the Northern Hemisphere had prior experience of the toxic qualities of the closely related fern species.
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*Pteridium aquilinum* (Leach 2001:32-33). Later, inhabitants of the temperate parts of Australia were observed using the bracken fern as a source of starch (e.g., Backhouse 1843: xxxix). Coupled with a pervasive ranking system of human groups that placed these Australians as ignoble savages, it is not surprising that botanists began to describe all these southern fern-root eaters as “unfortunate”. In the words of René Lesson and Achille Richard, the botanists on Dumont d’Urville’s *L’Astrolabe*:

New Zealand furnishes only a small number of edible plants. Thus the miserable inhabitants of this archipelago, for the most part fish eaters, are reduced to nourishing themselves on the rhizomes of *Pteris esculenta* [*Pteridium esculentum*] and some other ferns, when they lack fish (Lesson and Richard 1832: xv [transl. HML]).

Achille Richard argued for the use of the species name *esculenta* (meaning edible) “because it indicates the usage which the miserable inhabitants of New Holland, Tasmania and New Zealand make of the root or stock of this fern, which is their principal nourishment” (Richard 1832:81 [transl. HML]). His words were repeated in Allan Cunningham’s account of the New Zealand flora in the *Companion to the Botanical Magazine* (1836:365).

These early 19th century botanical commentaries paid little attention to Māori consumption of other types of fern. One of these, the *mamaku*, *korau* or black tree fern (*Cyathea medullaris*), had been the subject of an unsuccessful experiment by the Forsters in Dusky Sound in April 1773. Johann Reinhold Forster (Hoare 1982:263-64) reported how some of the crew had seen how the local Māori took “the Stalks of the Ferntrees, broiled the whole & eat the inner-pulp. It was found by our people as good, if not better than potatoes. We ordered some to-day for dinner”.

Forster expected it to be like the pulp of the “Sagoe-tree”, but later admitted, “Our fern was not done & therefore not eatable”.

There is a strong possibility that their experiment was not conducted with the right type of tree fern, in the light of the following episode that took place a few months later at Ship Cove in Queen Charlotte Sound. There the Forsters succeeded in tasting Māori-cooked *mamaku* in November 1773. Johann wrote that “it tasted like a Turnep or rather better” (Hoare 1982:426). When he asked to see the plant, a Māori brought him “a Fern-tree with root and all”. He called it “Mamagu”. When Johann pointed to a large tree-fern near him, “with leaves whose underside is white, he shewed …[him] the difference & called the latter Ponga” (Hoare 1982:426). The *ponga* (*Cyathea dealbata*) is entirely inedible.
In comparison to bracken fern-root, Johann’s father George found *mamaku* a more palatable product. His stated opinion reinforced the undesirability of “that wretched article of New Zealand diet, the common fern-root” and provided a sound explanation why *mamaku* could not replace it in importance: “it is not plentiful enough for a constant supply” (Forster 2000:277). Botanists were later to find the black tree fern absent from drier and frost-prone parts of New Zealand (Brownsey and Smith-Dodsworth 1989:87).

In his dissertation on edible plants of the islands of the South Pacific, George Forster (1786:74-75) specified the edible parts of the *mamaku* as the root and pith of the lower trunk. When cooked, this was soft and pulpy and the taste had “a certain similarity to turnip” [transl. HML]. The pith was full of a reddish glutinous sap. *Mamaku* (classified by Forster as *Polypodium medullare*) and bracken fern-root were the only edible New Zealand ferns mentioned in this dissertation.

Longer periods of study involving visits to the interior were needed for a greater awareness of Māori fern use. Though the *L’Astrolabe* botanists obtained the Māori names of another eight fern species they did not comment on their edibility. Nor did the Cunningham brothers whose botanical observations in northern New Zealand (Allan in 1826 and Richard in 1833-34) revealed several new fern species. It was William Colenso who first described an edible fern of considerable significance in Oceania that he encountered in Northland some time before 1841. Describing his arrival at Waikare, in the inland Bay of Islands, on his 1841-42 walking trip, he wrote:

*It was from the woods in this locality, that I first obtained specimens of the Para, a fine fern of the *Marattia* genus…. This plant was formerly in great request among the natives, the large gibbous fleshy and vaginant bases of its petioles, being an article of food of the first quality. Hence its scarcity, a few plants only being found remaining in the deepest and darkest recesses of the forest (Colenso 1844:91-92).*

In the 19th century the scarcity of this fern was undoubtedly exacerbated by the spread of feral pigs that seek out members of this genus (e.g., Palmer 2003:178). In 1880 Colenso stated that he had sent specimens to Allan Cunningham, which would place his discovery of the plant before Cunningham’s death in 1839 and after Cunningham had written the section on ferns that was published in 1836.

By 1868 Colenso was able to add several other edible fern products to the list of Māori foodstuffs, including “the young succulent unexpanded shoots of several ferns, such as those of *Pteris esculenta* [now *Pteridium*...
esculentum], Asplenium lucidum [A. oblongifolium], A. bulbiferum, and Botrychium virginicum [B. australis]” (Colenso 1868:261). In 1880 he held the opinion that the shoots of the two Asplenium species had been neglected as a food item for some 40 or 50 years, supplanted by the introduced naturalised wild cabbage (Colenso 1880:31). He made no reference to the other two ferns.

Not all fern foodstuffs had been abandoned, however. The inhabitants of Patetere, at the head of the valley of the Waihou, were found to be living on bracken fern-root and mamaku in early January 1846 (Johnson in Taylor 1959:146-47). These should not be assumed to be simply emergency supplies. On an official visit with Governor Grey to Hikurangi in 1878, Thomas H. Potts was served a thick syrup prepared from mamaku pith. He found it “deliciously cool, of a pleasant bitter-sweet flavour” (Potts 1976:15). At the feast given by Tawhaio, chunks of cooked mamaku, about 30cm in length were presented to the guests, along with the rootstock of the para fern, described as pinkish when cut, “solid, tough, and nearly tasteless” (Potts 1976:17).

During the 19th century, several Europeans had the opportunity to taste native ferns, though not all as willingly as Potts. The adventurer John Boulthbee was forced to adopt Māori foods while living at The Neck, Stewart Island in 1827. He and his companions tried tree fern to offset the constipating effects of bracken fern-root. They found it “but a poor substitute for potatoes, & all it does is to keep the body cool, which we did not now require, as our empty stomachs tended to that effect” (Begg and Begg 1979:212-13). In the case of Charles Heaphy and Thomas Brunner consumption of ferns was also a necessity, for their journeys on the west coast of the South Island took longer than their European food rations of flour and potatoes could support. On their journey to Arahura in 1846, the two men and their Māori guides ate mamaku cooked in earth ovens on four occasions and abandoned one ovenful on a fifth, because its excessive heat had spoiled the contents (Heaphy in Taylor 1959:232, 242-45). For hungry travellers the process of rendering the stem edible was painfully drawn out.

The mamaku, requiring to remain steaming for twelve hours, we did not open the oven until breakfast time this morning, when we were grievously disappointed in our fare, and learnt that twelve hours more would be necessary for the vegetable to cool and consolidate ere it would be palatable. Mamaku, when mixed with wine, sugar, and spice in a tart, might be mistaken for baked apple; at the Five Fingers [south of Cape Foulwind] however, the illusion was not perfect (Heaphy in Taylor 1959:232).
In Heaphy’s opinion, the *mamaku* was “a cold and watery vegetable at best, ill adapted for food in the winter, and, where anything else can be procured, hardly worth the carrying” (Heaphy in Taylor 1959:245). Its wet weight rendered it much less desirable as travellers’ food than bracken fern-root, but the latter was restricted to just three locations on the coast between Arahura and Cape Farewell (Heaphy in Taylor 1959:243).

A year later, Thomas Brunner and his Māori guides not only found bracken fern-root scarce on their inland route from Nelson, but encountered no *mamaku* on the critical sections of their route down the Buller Valley where they became seriously short of food. There they resorted to the tree fern known as *katote* (*Cyathea smithii*), cooking it on at least two occasions. On the first, Brunner reported that it was “far from palatable, and exceedingly indigestible”, but later he modified his opinion to “palatable, but far from satisfying” provided it had 12 hours in the oven (Brunner in Taylor 1959:268, 277). In contrast he enjoyed the *mamaku* that they cooked when they reached the coast (Brunner in Taylor 1959:282).

The full range of fern species used in traditional Māori diet will probably remain unknown, despite the observations of committed ethnographers like Elsdon Best, who lived and worked with Māori communities still using forest products extensively at the close of the 19th century. At the same time lexicographers like Bishop William Williams were actively collecting the Māori names of ferns. Cheeseman’s (1906) Appendix III of Māori plant names and their botanical equivalents in his *Manual of the New Zealand Flora* contained 88 Māori terms for fern species or products. Among these were 11 applied to the rhizome of bracken (including the cooked and pounded product), another three to the young shoots, and five to the bracken plant as a whole. Harry Allan (1961) contributed another seven bracken-related names. Although there are obvious alternative spellings in these lists, it is clear that the bulk of the Māori fern lexicon was recorded a century or more after first contact.

Less information was collected on the uses of the numerous species, probably because many had been superseded, as Colenso acknowledged in 1880. But the uses that were reported covered many more than consumption: food-wrappers for *umu* cooking, use in bedding and packing, clothing, trap-making, house construction, lining of pits, treatment of infection, path marking and as sources of scent. There were uses in ritual performance as well (e.g., Riley 1994:189, 319).

Māori mythology and tradition singled out a few particular species. In Arawa mythology, Haumia-tiketike fathered bracken fern-root, while Ponga was the deity of hard tree ferns and Korau (an alternative name for *mamaku*) the god of edible ferns (Orbell 1995:49, Tregear 1891:167, 351,
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White 1887, I: Appendix). The *para* fern was supposedly transported to Aoteroa on the Aotea canoe, along with *karaka* and a variety of *kumara* (White 1889, II:180). In the Ngati Porou tradition concerning the canoe Horouta, the early ancestor Toi was found to be living on wild foods, namely cabbage tree, bracken fern-root and *mamaku*, which were not esteemed by his visitor Rongo-i-amo from Hawaiki who desired *kao* (preserved *kumara*) (Turei and Kapiti 1912:154). In a similar vein, Grey recounted how Paoa, eponymous ancestor of Ngati Paoa, was ashamed to serve visitors the wild foods gathered by his slave wife who “had just come back from the forests, from gathering the curved sprouts of the mamaku trees, and sprouts of the mauku [*Asplenium bulbiferum*], and such coarse kinds of wild food as are eaten in times of scarcity” (Grey 1869:338).
Such stories promoted the impression that ferns were second-rate, famine foods. In the light of ethnographic records from tropical Polynesia, where fern eating was interwoven with traditions of starvation, this impression has become general. It was a key element in my review of wild plant foods in New Zealand against their Polynesian background (Leach 1986). This paper proposed that there were Oceanic precedents for many of the preparation techniques applied to wild plant foods in Aotearoa and that these precedents were long-standing responses to periodic food scarcity on Polynesian islands affected by tropical cyclones or droughts. Although the overall conclusions still hold, it is now clear that the status of wild plant foods was more variable than European generalisations suggested (Leach 2003).

The case for a more favourable Māori attitude to bracken fern-root has recently been advanced (Leach 2001), while Colenso’s observations on para and Potts’s on mamaku (quoted above) suggest that these species were locally valued.

Figure 2: The edible rootstock and petiole bases of para (Marattia salicina) (left) were already familiar to East Polynesians on their arrival in Aotearoa, while mouki (mouku, mauku) (Asplenium bulbiferum) (right) belonged to a widespread Pacific genus with edible shoots. (Illustrations adapted from Greta Stevenson (1954) A Book of Ferns. Dunedin: McIndoe, pp. 26, 122.)
OCEANIC PRECEDENTS AND PARALLELS

In the context of Māori fern use, it is worthwhile reviewing and reconsidering the following questions:

- Which of the edible fern species or genera encountered in Aotearoa were already known to the Polynesian ancestors?
- Which New Zealand fern species were given names formerly applied to ferns (of the same or different genera) in Eastern Polynesia?
- What did the species for which these cognates occur have in common?

The fern flora of the high islands of Eastern Polynesia overlaps with that of New Zealand. In Brownsey and Smith-Dodsworth’s authoritative *New Zealand Ferns and Allied Plants* (1989), 26 of the fern species have distributions that include both New Zealand and the Pacific islands, and 33 genera have representatives in both areas. All the major growth forms present in the tropical ferns can be found in Aotearoa: from the tree ferns with their tall “trunks”, to creeping ferns with underground rhizomes, ferns perching or climbing on forest giants, and tufted ferns. Ancestors of the Māori would have seen many familiar features in the native fern flora, even in the cold rainforests of Fiordland and Rakiura (Stewart Island). However, it must be stressed that they would have found very few species that they had prior experience of eating.

Fern consumption was restricted to only a few species in Eastern Polynesia (Table 1). In Hawai‘i, *Marattia douglasii* (which the Hawaiians called *pala* after its related Southern Hemisphere species, *M. salicina*) was baked in the earth oven (*imu*) and eaten in times of food scarcity (Handy and Handy 1972:234, Palmer 2003:178). The “trunks” (strictly speaking an erect rhizome or caudex) of two types of tree fern of the genus *Cibotium*, known as *hapu‘u*, were cooked in volcanic steam vents at Kilauea as a source of starch (Handy and Handy 1972:234). The pith and young shoots of the *‘ama‘u* fern (*Sadleria cyatheoides*), a species that to Māori eyes might have looked a little like a squat *mamaku*, was another famine foodstuff. The roots and young fronds of the *kikawaio* (*Christella cyatheoides*) were eaten raw (Handy and Handy 1972:234, Palmer 2003:88).

At the hub of East Polynesia, in the Society Islands, Daniel Solander was able to record Tahitian names for 14 of the fern species that he encountered in 1769. But only one of these was recorded as a food item—the fern he called *Polypodium suaveolens*, “enahei”. Now classified as *Angiopteris evecta*, with the Tahitian name written as *nahe*, this is a huge terrestrial fern with wide-spreading fronds, on a short thick trunk (Palmer 2003:48-49). Solander recalled the sweet smell of the crushed foliage in his choice of its species name (Solander n.d.:364). He described its preferred habitat as beside rivers and on hillsides, and remarked that its root is edible but not...
greatly sought after. William Ellis (1831:50) admired the size, beauty and fragrance of *nahe*, but insisted that its “large tuberous kind of root” was only baked “when other supplies fail”. Henry (1928:65, 423-26) added that the “trunks” were steeped in water before baking and provided an origin myth for the plant, reinforcing its association with starvation. The name *nahe* was applied to the same species on Raivavae (Brown and Brown 1931:99) and on Rurutu in the Austral Islands where the “rance” [rank] rhizome also served as a famine food (Vérin 1969:203).

In the Marquesas Islands the Rev. William Crook (1799:129) referred to a root with the name *nahei*, eaten in times of scarcity, which was probably the same species. He provided a good description of the giant ovens built to cook both the *ti* (*Cordyline fruticosa*) and an unnamed fern, probably the *nahei*:

The Te, called here Ge, has a root resembling a parsnip, and of a delicately sweet taste, when baked. It is put, with a species of Fern Root, into a very large oven in the ground, before daylight, and not taken out till the forenoon of the next day. Larger Stones are put into the Oven, for this purpose, than for any other. All the Wood of a large tree is laid underneath, and set on fire, when the whole is prepared. The heat is so intense, that the nearest trees are scorched, and their branches destroyed thereby. Sometimes, after the Oven is covered over, it bursts, and makes a report like a Cannon (Crook 1799:67-68).

Table 1: Selected East Polynesian Fern Species and their Vernacular Names (*E* = edible).

<table>
<thead>
<tr>
<th>Species</th>
<th>Māori</th>
<th>Rarotongan</th>
<th>Tahitian</th>
<th>Marquesan</th>
<th>Hawaiian</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Marattia salicina</em> (E)</td>
<td>para</td>
<td>para</td>
<td>para</td>
<td>pa’a</td>
<td>pala</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>(M. douglasii)</em></td>
</tr>
<tr>
<td><em>Cyathea medullaris</em> (E)</td>
<td>mamaku</td>
<td>mamaku</td>
<td>mama’u</td>
<td>tukuu</td>
<td>‘ama’u</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><em>(Cyathea spp.)</em></td>
<td><em>(C. affinis)</em></td>
<td><em>(Sadleria cyatheoides)</em></td>
</tr>
<tr>
<td><em>Pteridium esculentum</em> (E)</td>
<td>anuhe</td>
<td>[sp. not present]</td>
<td>[sp. extinct or never present]</td>
<td>[sp. not present]</td>
<td>kilau, pai’a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>(P. aquilinum)</em></td>
</tr>
<tr>
<td><em>Dicranopteris linearis</em></td>
<td>[sp. rare]</td>
<td>tuanu’e</td>
<td>anuhe</td>
<td>u’uhe</td>
<td>uluhe, unuhe</td>
</tr>
<tr>
<td><em>Angiopteris evecta</em> (E)</td>
<td>[sp. not present]</td>
<td>na’e, ‘aana’e</td>
<td>nahe</td>
<td>nahei</td>
<td>[historic introduction]</td>
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</tbody>
</table>

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This description suggests ovens of the size of Māori or Samoan umuti or even larger.

On Rarotonga na‘e and ‘aana‘e both referred to *Angiopteris* species (Biggs and Clark 1998, Cheeseman 1903, Wilder 1931). Neither the species nor cognates of the East Polynesian name were found in New Zealand. It appears that the name was first applied to these large edible ferns in West Polynesia, where nase was the Samoan cognate recorded by Pratt (1984:229) for both *Angiopteris evecta* and a *Marattia* species (*M. ?smithii*). Though the species *Angiopteris evecta* occurs in Tonga, its local names hulufe tanu (Tafahi) and hulufe vai (‘Eua) (Whistler 1991:48) are unrelated. In Tongan hulufe is a generic term for ferns with pinnate or bipinnate fronds (Sykes 1978:136-37) and is a cognate of aruhe.

In the case of another widespread fern, the *para* (*Marattia salicina*), the species was recorded as a famine food in Tahiti in John Davies’s 1851 dictionary, a decade after Colenso described its sought-after status in New Zealand. This fern was known as pa‘a hei in the Marquesas and *para* on Rarotonga, again listed as a famine food (Brown and Brown 1931:103, Cheeseman 1903:312). Its appearance and uses would presumably have been well known to the first East Polynesians to reach Aotearoa.

Though the Māori term for bracken fern-root, aruhe, has cognates in East and West Polynesia, the tropical species called uluhe and umuhe in Hawai‘i (Neal 1965:9, Palmer 2003:113), anuhe in Tubuai (Aitken 1930:14), anuhe in the Society Islands (Davies 1851:24, Solander n.d.:364-65), and tuanui [tuamu‘e] in Rarotonga (Cheeseman 1903:306) was actually *Dicranopteris linearis*, the false staghorn fern, not *Pteridium esculentum*. Forms of the cosmopolitan *P. aquilinum* and *P. esculentum* do occur in the tropical Pacific—in Hawai‘i (Palmer 2003:223-24), Tofua in Tonga (Whistler 1991:49), Fiji (Brownlie 1977)—but appear less vigorous than *Dicranopteris linearis*. Palmer’s description of the growth habit of the latter in Hawai‘i strongly suggests why the name was transferred to the bracken fern in New Zealand:

An early colonizer of landslides and disturbed areas, uluhe often forms large tangled mats of crisscrossing secondary rachises that cover entire hillsides and are the bane of many a cross-country hiker. These mats are composed of one or a few clones (Palmer 2003:115).

*Dicranopteris linearis* is present in New Zealand, but it is totally restricted to the thermal regions of the North Island where it survives beside hot springs where it, nevertheless, is frequently damaged by frost (Brownsey and Smith-Dodsworth 1989:55-56). Its role as a coloniser in the tropics was
taken over by the hardy bracken fern in New Zealand. As Biggs (1990,1991) has demonstrated with many other plants found on arrival in this temperate environment that were not present in the tropics, the immediate transfer of a pre-existing Tahitic subgroup term to a New Zealand plant with certain quite similar characteristics, was a common practice on initial arrival. In the case of the bracken fern, however, it took further experimentation to learn that it was also a useful source of food.

In only two sources is there evidence that the rhizomes of *Dicranopteris linearis* were eaten in Polynesia. Savage’s Rarotongan dictionary, prepared in the early 20th century, contains the comment that the roots were eaten after treatment (Savage 1962:404), but it seems strange that this practice was not known to Cheeseman when he worked on the Rarotongan flora c.1901. The second piece of evidence comes from Forster’s dissertation (1786). For the species that he knew as *Polypodium dichotomum* (which is today classified as *Dicranopteris linearis* [Brownsey et al. 1985:452]), Forster stated that

> it grows wild in the dry mountains of New Zealand, and indeed within the tropics, on very dry hillsides in the Society Islands. The people of New Zealand feed on the root that has been toasted over the fire and hammered with a stone or knobbed stick, exposing the sweet, mealy part (Forster 1786:75 [transl. HML]).

Since Forster did not visit the thermal parts of New Zealand where *D. linearis* is to be found, we must assume that he is mistakenly conflating the bracken fern of New Zealand and its Māori usage as food, with the false staghorn fern in Tahiti. We should note that he does not say that the Society Islanders used this particular fern as food. Another entry in the dissertation adds to the confusion: under *Pteris esculenta*, for which he noted the vernacular Tahitian name as “e-Narré”, he wrote: “It is found in woods of the Society Islands. The insipid woody-fibrous roots, of little nutrient value, are sucked by poor and famished natives” (Forster 1786:74 [transl. HML]). Later botanists such as Achille Richard (1832:79), and Allan Cunningham (1836:365) seem to have been seduced by the botanical name into thinking that Forster was here referring to the bracken fern, and indeed Harry Allan (1961:64) proposed that *Pteridium esculentum* had been present on the Society Islands, but was now extinct. *Pteris esculenta* is an accepted synonym of *Pteridium esculentum* (Allan 1961:64, Brownsey et al. 1985:463), but Forster’s description of the habitat as “in woods” does not match bracken’s light requirements. In that case, the Tahitian name “e-Narré” should be heard as *e nahe* rather than *anuhe*, and the forest fern *Angiopteris evecta*
may well be the plant he was actually describing. On Cook’s earlier voyage Solander heard “Ea-nuhe” for what we now know as *Dicranopteris linearis*, and “Enahei” for *Angiopteris evecta* (Solander n.d.:36-65). He reported the New Zealand bracken fern under the taxon *Pteris esculenta* noting the Māori name as “Eanuhe” (Solander n.d.:590). He did not record this species in the Society Islands, despite extensive botanising.

If *Dicranopteris linearis* roots were not eaten in East Polynesia this would remove any obvious tropical precedent for Māori consumption of bracken roots and suggest that the ancestors of the Māori had to discover for themselves the edible qualities of the fern that took over the name *anuhe/aruhe*. There were, however, general precedents for the cooking of the “trunks” of tree ferns in East Polynesia, although in the case of the Māori *mamaku*, the species of *Cyathea* tree fern that carried this name (*mama’u*) in Tahiti, does not seem to have been eaten at the time of European contact. Only the *para* fern would have been specifically identified by the Māori with a familiar food plant from their tropical homeland; hence the oral tradition (cited above) which stated that it was brought from Hawaiki.

We can be confident that experience with tropical ferns would have encouraged the first Polynesian settlers in Aotearoa to cut down and bake the various tree ferns they encountered until they established that the pith of *mamaku* (*Cyathea medullaris*) and *katote* (*C. smithii*) offered the best value. Those living in warm forested areas from Taranaki and Tuuranga-nui to Tai Tokerau needed no introduction to the *para* fern (*Marattia salicina*). Several of the *Asplenium* species (*A. bulbiferum* and *A. obtusatum*) would have been familiar, and their uncurled fronds (*pikopiko*) successfully tested for edibility. Similar testing would have revealed edible fiddleheads in some other indigenous ferns. However the fern that was to become “like bread”, the bracken (*Pteridium esculentum*), required more experimentation. As soon as horticulture became well established, bracken would have begun to invade garden plots, especially where forest margins had been pushed well back by frequent burning. An appealing scenario would be that gardeners discovered the food potential of the *aruhe* as they prepared previously cleared plots for planting *kumara*. (Eventually they learned to keep the production areas of these two important plant foods well apart.) However East Polynesian familiarity with the starch reserves in both tuber crops and the roots of some wild or feral plants is likely to have encouraged experimentation from first settlement. The natural distribution of the bracken fern along ecotones, such as the margins of dunes, coastal forests and riverbanks, would have drawn Māori attention to this fern almost as they stepped ashore. The natural erosion prevalent in such zones would have exposed the thickened rhizomes to their view.
It is clear that there were sufficient Oceanic precedents for fern consumption, as well as cues for identification of edible species, to aid Māori in their initial food quest from the time of first settlement. Though the bracken fern-root came to dominate subsistence patterns by the 18th century, the persistence of other fern species in 18th–19th century Māori diet should remind us that in prehistory survival depended on knowledge of a broad spectrum of wild plant foods, including many genera of ferns.

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REFERENCES


Grey, Sir George, 1869. On the social life of the ancient inhabitants of New Zealand, and on the national character it was likely to form. *Journal of the Ethnological Society of London* (N.S.), 1:333-64.


