mounds, though it looks as if these are a rather poor substitute substrate for the beech, because you never see very many plants of *G. rawlingsii* on them. Given that *G. rawlingsii* will have that amazing grammitid gametophyte, the filamentous gemmiferous prothallus that can grow out to or be dispersed to sites away from that where the spore germinated, it may be one of the few ferns that can cope with the setup. With prothalli like this you can, at least in theory, get quite a big colony of plants derived from a single spore.

Acknowledgements
To Leon Perrie for herbarium records of *Grammitis rawlingsii* from WELT/Te Papa and Ewen Cameron for records from AK (Auckland Museum).

References
Esler, A.E. 2006: An appreciation Joe Rawlings (1906-1978). *Auckland Botanical Society Journal 61*: 128-129
Parris, B.S.; Given, D.R. 1976: A taxonomic revision of the genus *Grammitis* Sw. (Grammitidaceae: Filicales) in New Zealand. *New Zealand Journal of Botany 14*: 85-111.
Shaw, D.; Wilcox, M.D. 2008: Kauri Point Domain, Soldiers Bay, Kauri Park. *Auckland Botanical Society Journal 63*: 86-90.
Young, M.E. 2007: Easter Camp: Karikari Peninsula and environs. 6-9 April 2007. *Auckland Botanical Society Journal 62*: 41-47

Memories of finding *Grammitis rawlingsii*, and of Joe Rawlings, retired forest pathologist

Barbara Parris

The original description of *Grammitis rawlingsii* (*New Zealand Journal of Botany 14*: 85-111, 1976) showed that the first collection was listed by Parris, Rawlings & Croxall on 29 December 1970 (AK 128133, wrongly cited in the paper as 120133). John Croxall and Ihad been staying with Joe Rawlings in Kerikeri for some northern botanising (I got the women's guest quarters, the back of his Ford Falcon station wagon with luxurious mattress, on the grounds that it wasn't suitable for me as an unmarried woman to share a house with a couple of blokes), and went over to Waipoua to see the Toatoa Track, which I hadn't visited before. I saw this rather scruffy looking *Grammitis* on the ground on a mound together with *Tmesipteris tannensis,* and thought, "what a strange habitat for a *Grammitis*", and picked it. The blokes were added as co-collectors in the usual way, because they were there at the time and part of the trip. I started looking at *Grammitis* in 1973 when based in the United Kingdom, having realised that Copeland's monograph was not up to scratch for Australia or New Zealand (but was pretty good for Papua New Guinea), and I borrowed AK material. That Toatoa Track plant really stood out as extremely different once it was under a dissecting microscope and was obviously new, but the AK collection wasn't great, so I wrote to Joe at the end of 1973 and said if he could collect me a decent plant I'd name the new species after him. He collected the material on 10 January 1974 and this is *Parris 5242* - holotype CHR 276247, isotype (K). He requested that the holotype should be in CHR, rather than in AK, because that was where most of his specimens ended up. He said he'd jumped into his car almost immediately and headed for Waipoua because the only other thing named after him was some slimy fungus (by Joan Dingley) and he wanted to be remembered by something more attractive.

Not long ago I rediscovered the site of Joe's old place on Opito Bay roadin Kerikeri, when an acquaintance was showing me around her large, partly overgrown garden and said, "there's an old dunny in here somewhere". We didn't find the dunny, but I walked up to the road and worked out that the road curve and the land slope was exactly right for his place. No sign of the house, which was basically a kitchen-living room and a bedroom, with the occasional blackberry trailer coming in through gaps in the wall, heated by a big old wood burning range with wetback. "Refrigeration" was by the good old trick of muslin and a basin of water, and a meat safe on the south side of the house. Joe's staple for the first couple of days of field work was a huge casserole of chicken and veal and lots of sliced white bread to be shared out for lunch and dinner – he was a pretty competent cook judging by the casserole. Sometimes he'd haul out photographs of his English childhood for our edification: I wonder what happened to them all? They don't make 'em like Joe any more.

What is pikopiko ?

Mike Wilcox

Several references, namely Allan (1961), Brownsey & Smith-Dodsworth (1989), Beever (1991) and Crowe (2004) state that pikopiko is the Maaori name for the common shield fern (*Polystichum richardii*, now split into *P. wawranum*, *P. neozelandicum* and *P. oculatum* – see Perrie et al. 2003). Furthermore, in the New Zealand Country Report on plant genetic resources to the United Nations (Ministry of Agriculture & Forestry 2007) it is stated in relation to indigenous plant resources that "some native plants are still sought after today, such as the green shoots of the pikopiko fern (*Polystichum richardii*). Buck (1950) and Clarke

(2007) also give pikopiko as the name for edible shoots of *Polystichum richardii*.

Fig. 1. Dish of pikopiko, internet image, courtesy of Charles Royal, Kinaki NZ®(www.maorifood.com).

I have long been suspicious that pikopiko in the culinary sense does not refer to *Polystichum richardii* or its derivatives because this fern does not have particularly plump, edible shoots, but is the name given to young fern fronds of *Asplenium bulbiferum* much relished by Maaori people as a delicacy. While working with the Ngati Whare people in Whirinaki Forest I accompanied a group on a walk through the forest, and asked them to show me what they called pikopiko. This they did, and it was the plant, hen and chicken fern (*Asplenium bulbiferum*), and no other species, but they could have meant "this is the plant from which we collect pikopiko".

That pikopiko refers to *Asplenium bulbiferum* is confirmed in an article about traditional Maaori herbs by Sue Hoffart (Hoffart 2009) where she talks to Charles Royal of Kinaki NZ® in Rotorua. Pikopiko is one of the popular items Royal sells to gourmet restaurants, with supplies of these baby fern fronds coming from pickers in the King Country, Mamaku Range, and Waihau Bay. The article clearly illustrates and identifies pikopiko as the young frond tips of *Asplenium bulbiferum*. Shaw, Schuster & Nicholls (1991) also record pikopiko as the name for young fronds of the hen and chicken fern *Asplenium bulbiferum* in the Rotorua district.

Another reference indicating that the unfurled fern fronds harvested as pikopiko are *Asplenium bulbiferum* is Ogilvie et al. (2006). These authors studied the uptake by pikopiko of 1080 pesticide used to kill animal pests. The study was done in the Urewera Range where pikopiko is much harvested. Fortunately, pikopiko was shown not to take up 1080.

Best (1903) says that pikopiko is the name applied to the young, curled, undeveloped fronds of *Asplenium bulbiferum*, a favourite kinaki (relish) for potatoes, and he later (Best 1908) states that "the *mauku* fern (*Asplenium bulbiferum*) is the most common fern in the Tuhoean forests. The young undeveloped fronds, termed *pikopiko*, form an article of food". He records the name tururu mauku for the bulbils (young plants or chickens) of this fern. Confusingly, in this same article Best lists pikopiko as the local name for "*Aspidium richardi*". Mention is also made in Best (1942) that pikopiko refers to the undeveloped fronds of *Asplenium bulbiferum*, and the New Zealand Plant Conservation Network website likewise gives the Maaori name pikopiko for *Asplenium bulbiferum*. Without mentioning pikopiko, Colenso (1869, 1881) lists *Asplenium bulbiferum* (and also *A. lucidum*, now *A. oblongifolium*) as "young, succulent, unexpanded fern shoots" used in season as a vegetable. In contrast, Beever (1991) gives the name manehau to shoots of this fern, and mouku and other alternatives to the plant itself, but also suggests that pikopiko refers to the curled shoots of young ferns in general as well as to the species *Polystichum richardii* in particular. He makes no specific reference to *Asplenium bulbiferum* or its young shoots being called pikopiko.

Fig. 2. *Asplenium bulbiferum* frond, Kauaeranga Valley, 18 April 2009. Photo: M.D.Wilcox.

Riley (1988) gives pikopiko as the name for fronds of mouku or mauku (*Asplenium bulbiferum*) and states that the name pikopiko is also given to the whole plant of the shield fern *Polystichum richardii*, whose curly fronds can also be eaten. Maggie Papakura, the famous Maaori guide at Whakarewarewa, Rotorua, who died in 1930, wrote a book (Papakura 1986) which included this account of pikopiko (also quoted by Riley); she did not mention shield fern or *Polystichum richardii*, (although Riley did) but is equivocal about what exactly pikopiko refers to:

"The very young fronds of the fern moku (*Asplenium bulbiferum*) were cooked and eaten as a vegetable, and also the very young fronds of paretao (*Asplenium*

obtusatum). The very young fronds of the pikopiko were gathered when they were four to six inches high, and cooked in a hangi on top of the kumara, and eaten as a vegetable. It was as tender as asparagus, and not unlike it in taste, and very nice indeed to eat. These young fronds of pikopiko were sometimes cooked and left in water for about two weeks, when they acquired an acid taste. The taste was like that of tinned asparagus, slightly acid, and it was considered a great luxury".

I can find no convincing evidence that the young shoots of *Polystichum richardii* were ever eaten regularly as food, and therefore conclude that pikopiko has two meanings – the Maaori name for the plant *Polystichum richardii* (and its derivatives), and for the unfurled edible shoots of *Asplenium bulbiferum*.

References

Allan, H.H. 1961: *Flora of New Zealand*. Vol. 1. Government Printer, Wellington.

Beever, J. 1991: *A dictionary of Maori plant names*. Auckland Botanical Society Bulletin No. 20 (2nd ed.).

Best, E. 1903: Food products of Tuhoeland: *Transactions of the New Zealand Institute 35*: 45-111.

Best, E. 1908: Maori forest lore: being some account of native forest lore and woodcraft, as also of many myths, rites, customs, and superstitions connected with flora and fauna of the Tuhoe or Urewera District– Part I. *Transactions of the New Zealand Institute 40*: 185-254

Best, E. 1942: *Forest lore of the Maori*. Dominion Museum Bulletin No. 14. Reprinted 1977.

Buck, P.H. 1950: *The coming of the Maori*. 2nd ed. Maori Purposes Fund Board, Wellington.

Brownsey, P.J.; Smith-Dodsworth, J.C. 1989: *New Zealand ferns and allied plants*. David Bateman Ltd, Auckland.

Clarke, A. 2007: *The great sacred forest of Tane*: *Te WaoTapu Nui a Tane. A natural pre-history of Aotearoa New Zealand*. Reed Books, Auckland.

Colenso, W. 1869: On the geographic and economic botany of the North Island of New Zealand. *Transactions of the New Zealand Institute 1(2)*: 1-58.

Colenso, W. 1881: Vegetable food of the ancient New Zealanders before Cook's visit. *Transactions of the New Zealand Institute 13*: 3-38.

Crowe, A. 2004: *A field guide to the native edible plants of New Zealand*. Third edition. Penguin.

Hoffart, S. 2009: The business of kai. *Alive* No. 3: 46-52. Southern Cross Healthcare.

Ministry of Agriculture & Forestry. 2007: *New Zealand*: *Country report for the commission on plant genetic resources for food and agriculture*. MAF, Wellington.

Ogilvie, S.C.; Ataia, J.M.; Waiwai, J.; Doherty, J.E.; Lambert, M.; Lambert, N.; King, D. 2006: Uptake and persistence of the vertebrate pesticide, Sodium Monofluoroacetate (Compound 1080), in plants of cultural importance. *Ecotoxicology 15(1)*: 1-7.

Papakura, M. 1986: *Makareti: The old-time Maori.* New Women's Press, Auckland (first published by Victor Gollancz Ltd, London, 1938).

Perrie, L.R.; Brownsey, P.J.; Lockhart, P.J.; Large, M.F. 2003: Evidence for an allopolyploid complex in New Zealand *Polystichum* (Dryopteridaceae). *New Zealand Journal of Botany 41*:189-215.

Riley, M. 1988: *Maori vegetable cooking*. Traditional and modern methods. Viking Sevenseas NZ Ltd, Paraparaumu.

Shaw, W.B.; Schuster, E.; Nicholls, J.L. 1991: Traditional uses of wild plants. pp. 109-114, *In* Clarkson, B.D.; Smale, M.C.; Ecroyd, C.E. (eds.) *Botany of Rotorua*. Forest Research Institute, Rotorua.

Acknowledgements

Thanks to Sue Scheele, Willie Shaw and Ross Beever for helpful comments on this article.

Spergularia in Auckland

Mike Wilcox

Adams, West and Cowley (2008) have recently revised the genus *Spergularia* (Caryophyllaceae) in Australia, where five indigenous and six introduced species are recognised. Five species were recorded as occurring both in Australia and New Zealand. In light of this re-assessment I was curious as to which of these *Spergularia* species we have in the Auckland area, and have accordingly checked material held in the Auckland Museum herbarium (AK), emphasising seed characteristics.

1. *Spergularia media* (L.) C.Presl

Native to Europe, naturalised in Australia and New Zealand (Canterbury) (Webb et al. (1988) – "coastal rocks and salt marshes, throughout New Zealand").

This species seems rare in Auckland, the only record being from Matheson Bay. The seeds are a smooth and of a rusty brown colour, and surrounded with a wing.

Matheson Bay, *P.Hynes*, 8 Dec 1968, AK 126121

Matheson Bay, *P.Hynes*, 29 Dec 1969, AK 121603

2. *Spergularia tasmanica* (Kindb.) L.G.Adams

Native to Australia and New Zealand. *Spergularia tasmanica* is recognised as a new species, previously included here under *S. media*. It is illustrated in Webb & Simpson (2001) on page 161 and also on page 6 as *Spergularia media* (from Titahi Bay, Wellington), but the papillate seed with the broad wing having a distinct gap, clearly identify this from the descriptions, illustrations and keys in Adams et al. (2008) as *S. tasmanica*.

The seed is black and prominently papillate. In some populations (Auckland west coast) the seed has a very obvious wing (as illustrated in Adams et al. (2008), and Webb & Simpson (2001)) while others are wingless (Hauraki Gulf islands). This species occurs on coastal rocks on offshore islands along the east coast from Three Kings Islands southwards. It is very rare on the mainland east coast, but is frequent on the west coast.