*Parapholis incurva**					x	
*Paspalum dilatatum**	x	x	x	x	x, B	
*Pennisetum clandestinum**	x	xM	x	I	x, B	
Petalochilus chlorostylus	x			x		
Phormium tenax			x			
Poa anceps					B	
*Polypogon fugax**					B	
*Polypogon monspeliensis**		M				
Potomogeton cheesemanii	x					229228
Pterostylis agathicola				PW		250315
Pterostylis banksii		x		PW	x	
Rhopalostyis sapida	x	x	x	x	x	
Ripogonum scandens	x	x	x	x	x	
Rytidosperma biannulare				EC		255959
Rytidosperma gracile	x	x		x		
*Rytidosperma pilosum**	x	x				
*Rytidosperma racemosum**	x				x	229249
Rytidosperma unarede		x				
*Schedonorus arundinaceus**	x	x	x	I		
Schoenoplectus tabernaemontani	x	x				
Schoenus tendo	x			x		
*Sporobolus africanus**		M		C	B	
*Stenotaphrum secundatum**		M	x		B, M	
Thelymitra longifolia agg.				?x	A	
Thelymitra pauciflora	?x					
Typha orientalis	x		x			
Uncinia banksii		x		PW		229304
Uncinia uncinata	x	x	x	x	x	
*Vulpia bromoides**		x				
*Watsonia ?aletroides**				C		256031

Grammitis rawlingsii Parris an association with hard beech?

Maureen Young & Barbara Parris

Maureen Young

Grammitis rawlingsii, one of the so-called strap ferns, has a tufted habit, and a stipe winged to the base and sparsely hairy. In the field, the long, almost parallel-sided fronds, and the habit of growing on mossy mounds in kauri forests, make it an easy species to "get one's eye in for". To confirm the identity, use a hand lens to look at a frond with green sori, and there will be brown hairs ringing the sori in the manner of artificial eyelashes. This useful character is of little value if the sporangia have shed spores, as the tangled mass of ruptured brown sporangia makes the hairs practically impossible to see.

Specimens from the Hunuas (Mangatangi Trig Track and Mt William), together with a couple of collections from Mt Hobson, Great Barrier Island, have the appearance and habitat of *G. rawlingsii,* including the affinity for the moss, *Leucobryum candidum*, but lack the characteristic dark soral hairs. This entity is currently known as *G.* aff. *rawlingsii*, with its status as yet uncertain, pending resolution of the status of ± hairless versus hairy *G. ciliata* and some other taxonomic problems with the genus in NZ (Barbara Parris pers. comm.).

The type locality for *G. rawlingsii* is the Toatoa Track, Waipoua Forest, where it was found in 1970 by Barbara Parris (not by G.B. (Joe) Rawlings as noted by Alan Esler (Esler 2006)). It is hard to find there now, but in 2006 I did manage to find one plant. The species was described in a taxonomic revision of the genus by Parris and Given (1976), and at that time the only known site was the type locality. Since then it has been found from the Hihi Peninsula near Mangonui in the north, to the Kauaeranga Valley in the south, with strongholds on the North Shore, near Warkworth, and Great and Little Barrier Islands.

Over the years I have noticed that although this fern is invariably found in kauri forest, around Warkworth and on the North Shore at least, it is also associated with hard beech (*Nothofagus truncata*). The hard beech component of northern forests is dwindling, no doubt due to global warming, and dead trees are often found near beech population sites. The common name comes from the fact that the wood contains silica. This blunted the saws of the old bushmen; it also means that dead trees take a long time to rot away. The outer sap wood slowly decays and becomes a good substrate for mosses, often the common milk moss, *Leucobryum candidum*, while the inner heart

wood remains flinty-hard. Where the heart wood protruded into branches, hard spikes are spaced along the rotting trunk. The mossy mounds that so result are where *G. rawlingsii* can often be found. The association with hard beech is not invariable – there is no beech near the Toatoa Track and none grows on Great Barrier Island – and I have never found the fern where there is beech but no kauri. However, when I am in forest with a mixture of kauri and hard beech I keep my eyes open for *G. rawlingsii*, and I am surprised at how often I am rewarded.

Fig.1.*Grammitis rawlingsii* at Brick Bay, Sandspit, Jan 2009. Photo: Jeremy Rolfe.

During the Easter 2007 Bot Soc camp at Karikari Peninsula, on a visit to private property at Hihi, we were promised a viewing of the most northerly hard beech to be found in the country. What a coincidence that Barbara was able to extend her northern limit for *G. rawlingsii* as well, as it was growing, as is often the case, on a mossy mound under a kauri tree. This forest begs for a more thorough searching.

On a Bot Soc trip to Kauri Park, Birkdale, in May 2008, a patch of the fern was found growing in the same kauri habitat. On a second visit later in the year (October 2008) some cross-country walking got a small party onto a kauri ridge where the ground was covered with *G. rawlingsii*, and when we raised our eyes we found that there were several hard beech trees in the canopy.

Fig. 2 Sori of *Grammitis rawlingsii* showing soral hairs, Jan 2009. Photo: Jeremy Rolfe.

Near Warkworth all three known sites are in kauri/hard beech forest. This summer I took photographer Jeremy Rolfe (Department of Conservation) into covenanted bush on Brick Bay Drive, Sandspit. I left him to his photography and wandered off, coming across a sight which inspired this article – a decaying hard beech tree outlined in *G. rawlingsii* plants (Fig. 1). Milk moss grew on the rotted parts, including an almost circular base where the tree had snapped off when it fell. Apart from heart wood spikes the branches had disappeared, but there were some areas of fern to indicate where they had been. A plant of *Collospermum hastatum* grew on the trunk, but apart from that the only species present was abundant *G. rawlingsii*. As I had been expounding to Jeremy my theory about the association of the fern and the tree, I called him over to see this perfect example. He was impressed!

Barbara Parris

The Toatoa Track population seems to be in very steep decline because of plant competition. My recollection of the first visit to it was of a much more open site and wherever I've seen it looking happy it has had a fair amount of head room and side room, so to speak. This might be a major function of the decaying hard beech substrate, that nothing much else wants to or can grow on it, at least at certain stages of its decay. If so it might be for chemical or for physical reasons. This maybe the same for kauri

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
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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