

Key to *Grammitis* of the Auckland Region

- 1 Hairs absent, or less than 0.5 mm long, not obvious with x 10 hand lens.....2
Simple and/or branched hairs more than 0.5 mm long present, obvious with x 10 hand lens.....3
- 2 In lowland to coastal forest of Hauraki Gulf, usually on rocks or earth banks; mean spore size less than 30 μm diam. rare aberrant \pm glabrous form of..... *G. ciliata*
In upland forest, known from Warawara and Mt Moehau, epiphyte; mean spore size more than 40 μm diam.
..... *G. magellanica* subsp. *nothofageti*
- 3 Hairs absent from sorus area.....4
Hairs present in sorus area.....5
- 4 Unbranched hairs always present, branched hairs always present; widespread above 500 m alt. in the Auckland region; usually epiphytic, very rarely on earth banks..... *G. billardierei*
Branched hairs always present, unbranched hairs absent; kauri forest associate of Great Barrier Island and Hunua Ranges, to be expected on Coromandel Peninsula; epiphytic, or terrestrial in open ridge forest..... *G. aff. rawlingsii*
- 5 Rhizomes with stipes 0.8-5.0 mm apart in each row; all frond hairs medium to dark red-brown; above 500 m alt. in the Auckland region, known from Great Barrier Island and Mt Pirongia; mean spore diam. more than 40 μm *G. patagonica*
Rhizomes with stipes 0.1-2.3 mm apart in each row; some or all frond hairs whitish, translucent, pale yellow-brown to pale red-brown; below 500 m alt. in the Auckland region; widespread; mean spore diam. less than 30 μm diam.....6
- 6 Sorus hairs stout, dark brown; kauri associate in North Auckland, Great and Little Barrier Islands and Coromandel Peninsula..... *G. rawlingsii*
Sorus hairs slender, whitish to pale red-brown; in various forest types.....7
- 7 No hydathodes (small dark dot at vein ending) on upper surface of lamina (use hand lens); usually on rocks and soil banks, rarely epiphytic, sometimes in coastal and secondary forest..... *G. ciliata*
Hydathodes present on upper surface of lamina; epiphyte in wet forest..... *G. pseudociliata*

A new record for the Auckland Region: *Schizeilema trifoliolatum* (Apiaceae)

Ewen K Cameron

During an Auckland Botanical Society monthly field trip to a private area of forest (Craig property) south of Barthow Road, west of Pollok on the Awhitu Peninsula, 18 September 2004 (see Aspin 2004), an interesting mat of a low herb was spotted by Maureen Young. The plant was superficially similar to *Ranunculus reflexus*, which was also present. It covered an area ca.2 x 1m (only a single patch was seen). Small flowering umbels were spotted below the leaves that placed it in the Apiaceae and it had a slight taste of celery. Genera like *Apium*, *Hydrocotyle* and *Schizeilema* were likely candidates, but the last-named seemed most unlikely because that genus wasn't known to be present anywhere near the Auckland region. The habitat was primarily native, but an exotic species couldn't be ruled out. The mature fruit are an important character when keying in the Apiaceae, and when Tricia Aspin sent me some ripe fruit the following month it keyed straight out to the native *Schizeilema trifoliolatum* (Fig. 1). A

remarkable record for the Auckland region because the genus is hitherto unknown this far north.

I asked other New Zealand herbarium curators for their northern records of *S. trifoliolatum* to see how far this new location extended the known northern geographical limit of this species (see Table 1). The result was 1° 21' northern range extension of the Maungatapere record (at 38° 30' S) collected by Bruce Clarkson (NZFRI 17352). But in a straight line the nearest known population to Pollok is in North Taranaki (White Cliffs) collected by Cheeseman (AK 6296-98) ca.195km away from Pollok, and also at west Taupo (Hauhungaroa Range) collected by Peter Bellingham & Shannel Courtney (AK 278271) ca.200km distant.

The habitat

Most of the Awhitu Peninsula is composed of a complex series of consolidated sand dune deposits that accumulated over the last 1-2 million years and are interspersed with small peaty lake deposits, and rhyolitic ash layers (Bruce Hayward pers. comm.).

The *S. trifoliolatum* was on consolidated sand, on a forested southeast-facing slope on a small ridge. The canopy was intact and locally dominated by tawa (*Beilschmiedia tawa*) and lancewood (*Pseudopanax crassifolius*); there were few weeds present, and the whole area was open to cattle. Kohekohe (*Dysoxylum spectabile*), puriri (*Vitex lucens*), karaka (*Corynocarpus laevigatus*), mangeao (*Litsea calicaris*) and kowhai (*Sophora chathamica*) were all frequent on the adjacent slopes. Apart from the forested steep south-facing slopes the general area was pasture grazed by cattle. The forest would be exposed to the prevailing winds from the southwest and perhaps even more exposed to the colder southerlies.



Figure 1. Fruiting *Schizeilema trifoliolatum* from Craig's bush, Awhitu (AK 288458), Oct 2004.

The forest forms the northern side of a natural amphitheatre, opening (and draining) to the west via Cochranes Gap, ca.2 km to the southwest. This gap would allow winds from the general southwest to funnel past the *S. trifoliolatum* locality.

Other southern geographical limits on the Awhitu Peninsula

Cameron (2000) reported a new northern limit for a moss, *Atrichum androgynum* (AK 229356), in Taitua Forest (south side of Hamilton Road), only 5.6km to the NNW of the *S. trifoliolatum* Pollok site. Similar to the *S. trifoliolatum* site, this moss locality is native forest on northern side of a natural amphitheatre, opening to the west via a gap (Hamiltons Gap), ca.3.3

km to the south. The nearest known population of *A. androgynum* appears to be at Te Kauri Scenic Reserve collected by Patrick Brownsey (WELT 27009) ca. 120km to the SSE.

In July 1869 T F Cheeseman collected matagouri (*Discaria toumatou*) from the sand hills near Waiuku (ca.15km SSE of Pollok: ca.37 15' S) (AK 5152), where it is now presumed to be extinct. The exact locality at Waiuku is unknown, but it may also have been on a south-facing slope open to the west. This is the most northern record known for this species. Matagouri is now a rarity in the North Island (Ogle 1996) and its present extant northern limit is in the central North Island near Waiouru (Colin Ogle pers. comm.).

Discussion

It is rather surprising to have northern geographical limits at such low altitudes, especially at even lower altitudes than their immediate population to the south. *Schizeilema trifoliolatum* and the moss (*A. androgynum*) were both at ca.100m asl and the matagouri would have been 0-200m asl. But this may be explained by their topographical position, i.e. on the northern side of a natural amphitheatre opening to the exposed west coast where the predominant wind is from the southwest, creating frequently cold, wet sites. The Awhitu Ecological District (which is mainly the Awhitu Peninsula) botanically is the most poorly known Ecological District (ED) in the Auckland region, e.g. the Museum herbarium (AK) holds only 705 specimens from the ED compared to 8,739 from the neighbouring Waitakere ED to the north. The recent discovery *S. trifoliolatum* and of the moss (*A. androgynum*) in 1996 suggest that other more 'southern species' might also be present in these special cooler, wetter areas of the Awhitu ED. The recent discovery of single small populations at Awhitu of both the *S. trifoliolatum* and the moss (*A. androgynum*) suggests that they may be relatively recent arrivals or relic species over-looked in the past because of their small size and occurring in a poorly botanised area. The moss has wind-blown spores and can potentially disperse over long areas, but the *S. trifoliolatum* seeds are small and fat and unknown to me how they may disperse (supporting a relic species?). These two species, along with other 'southern species', should be searched for in other suitable Awhitu forests and also between Awhitu and their next southern occurrence. *Schizeilema trifoliolatum* and *A. androgynum* should also be added to the Regional threatened plant list (de Lange et al. 1999).

Table 1. Northern *Schizeilema trifoliolatum* herbarium records

37° 9' S, Pollok, Awhitu; *E K Cameron 12456 & M E Young*, Sep 2004, ca.100m asl, AK 288199; & from the same population: *P A Aspin*, Oct 2004, AK 288458;

38° 30' S, Maungatapere; *B D Clarkson*, Jan 1991, [ca.1000m asl], NZFRI 17352;

38° 39' S, Hauhungaroa Range; *P J Bellingham & S P Courtney*, Mar 1985, [ca.870m asl], AK 278271;

[38° 55' S] White Cliffs, [northern] Taranaki; *T F Cheeseman*, Jan 1885, [0-245m asl], AK 6296-6298.

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References

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Identification of the seedlings of tawari, *Ixerba brexioides*

Rhys Gardner

In the red beech-rimu forests of the central North Island tawari is an abundant subcanopy tree, and on a visit in August to the Huiarau Range, west of Matawai, I was able to make a collection of its seedlings — more plentiful there by far than in the Waitakeres, it can be noted.

Adult tawari lacks stipules but the seedlings do have a structure in that position. There is a conical gland each side of the petiole base, on the crest of the ridge that leads down the stem (Fig. 1). These glands are much like those of the leaf's marginal tothing. Such "stipular glands" are not present on the cotyledons,

nor are they found at the bases of the small triangular cataphylls that often occur within the pseudowhorled sections of a seedling's foliage.

The presence of these structures, and the absence of hairs (the adult, by contrast, has T-hairs on its young twigs; Gardner 1997), would make identifying a tawari seedling "cold" something of a challenge. One might do it by making a chromosome count, the species having the unusual diploid number of $2n=50$ (Hair & Beuzenberg 1966).

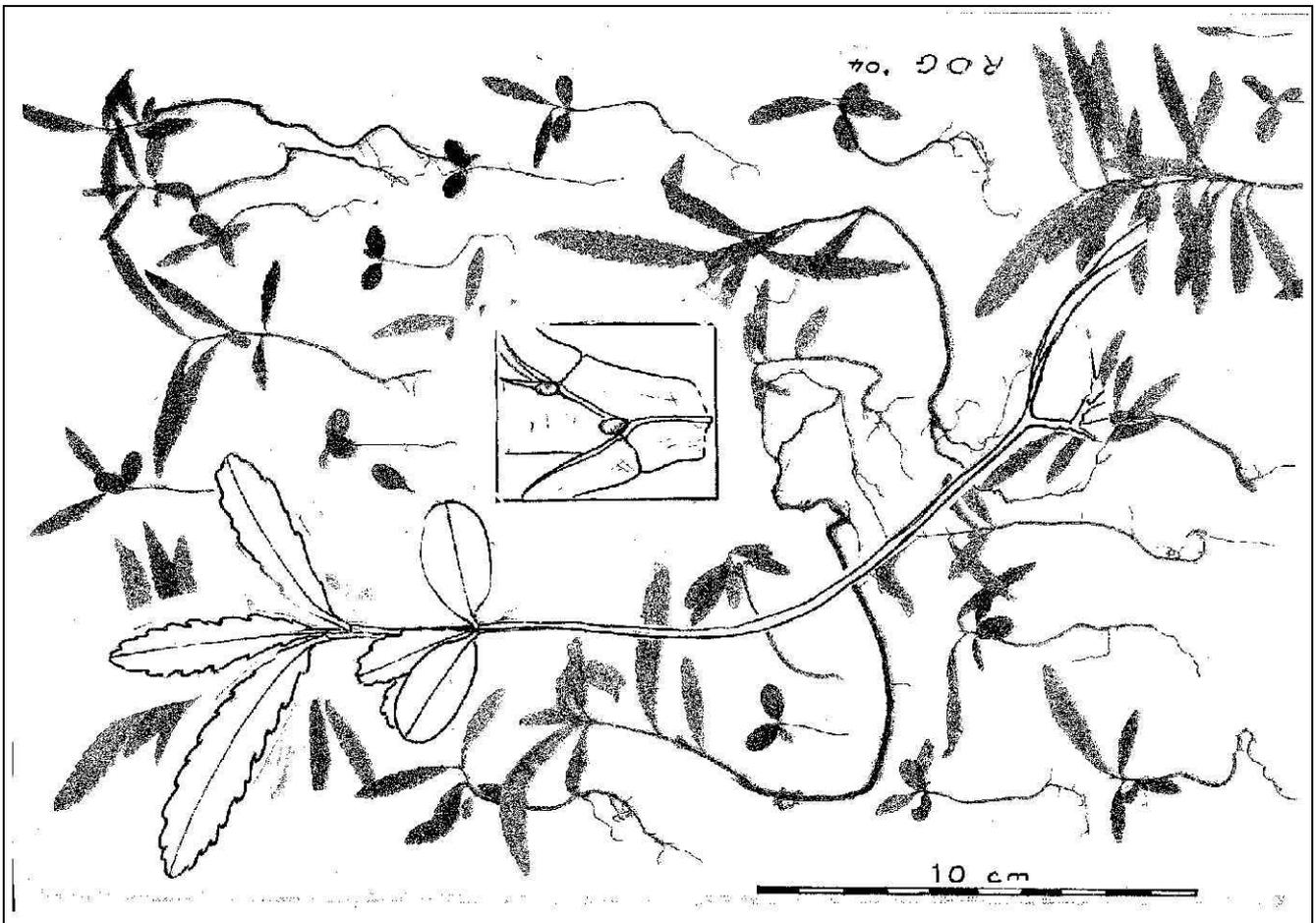


Figure 1: Seedlings of tawari (*Ixerba brexioides*). Photocopied material (ROG 10585, AK), scale bar = 10 cm. Line drawing of seedling collected from Spragg's Bush, Waitakeres (no voucher), with detail showing two