

# FLORA OF NEW ZEALAND

## FERNS AND LYCOPHYTES

### DAVALLIACEAE



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**P.J. BROWNSEY & L.R. PERRIE**

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Cover image: *Davallia griffithiana*. Habit of plant, spreading by means of long-creeping rhizomes.

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## Introduction

The medium-sized and mostly tropical family Davalliaceae is represented in New Zealand by one indigenous and two naturalised species of the sole genus *Davallia*; all of them are rare. The indigenous species, *D. tasmanii*, comprises two subspecies – one endemic to the Three Kings Islands and the other to Puketi Forest in Northland. The two naturalised species are also uncommon, occurring spasmodically in the northern half of the country.

All members of the family in New Zealand are terrestrial or epiphytic ferns with short- to long-creeping rhizomes densely covered in scales, fronds that are articulated to phyllopodia on the rhizomes, laminae that are often coriaceous and deltoid-shaped, and submarginal sori protected by lunate to pouched indusia.

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## **Davalliaceae M.R.Schomb., *Reis. Br.-Guiana* 3, 883 (1849)**

**Type taxon:** *Davallia* Sm.

Epiphytic, rupestral or terrestrial ferns. Rhizomes long-creeping, scaly, bearing short phyllopodia. Fronds monomorphic (NZ) or dimorphic (not NZ), articulated to the phyllopodia. Laminae 3-pinnate to 4-pinnate-pinnatifid (NZ) or also pinnatifid to 2-pinnate-pinnatifid (not NZ), anadromous, coriaceous, often glabrous but occasionally scaly (NZ) or hairy (not NZ). Veins free, terminating inside the lamina margin; false veins sometimes present between true veins. Sori oblong or obovate (NZ) or round or reniform (not NZ), borne on abaxial surface, submarginal or away from margin; paraphyses absent; indusia attached at base and at least part of the sides, pouched (NZ) to lunate (not NZ); sporangial maturation mixed. Sporangia with vertical annulus, usually 64 spores per sporangium. Homosporous; spores monolete, lacking chlorophyll; perispores verrucate, tuberculate or rugose.

**Taxonomy:** A medium-sized family of one genus and c. 65 species (PPG 1 2016).

The family Davalliaceae has been variously interpreted over time. Copeland (1947) recognised 12 genera, including *Oleandra*, *Nephrolepis*, and *Arthropteris*, a classification that was followed by Allan (1961). However, Pichi Sermolli (1977) separated the latter genera into Oleandraceae and Nephrolepidaceae, respectively, although *Arthropteris* is now treated in Tectariaceae (PPG 1 2016). Of Copeland's original genera, *Leucostegia* is now treated in Hypodematiaceae and *Psammiosorus* belongs with *Arthropteris* in Tectariaceae (PPG 1 2016).

The remainder of Davalliaceae was revised by Kato & Tsutsumi (2008), who recognised five genera: *Araioستيgiella*, *Davallia*, *Davallodes*, *Humata* and *Wibelia*. However, because the type of *Davallia* had not been analysed at that time, Christenhusz et al. (2011) advocated the recognition of only two genera, *Davallia* and *Davallodes*. On the basis of chloroplast and nuclear markers in 41 species, Tsutsumi et al. (2016) argued that the clades in the family are not well distinguished morphologically and they therefore recognised a single genus, *Davallia*, with seven sections. This was adopted by PPG 1 (2016) and the family treated as sister to Polypodiaceae based on analysis by Schuettpelz & Pryer (2007).

**Distribution:** A family largely confined to tropical and subtropical regions of the Old World and Pacific, but with a few species extending north to temperate areas of south-west Europe, China, and Japan, and south to New Zealand and Kerguelen (Nootboom 1994). The centre of diversity is in the Malesian region, but with significant numbers also in China and the Pacific.

**Biostatus:** Indigenous (Non-endemic).

**Table 1:** Number of species in New Zealand within *Davalliaceae* M.R.Schomb.

<b>Category</b>	<b>Number</b>
Indigenous (Endemic)	1
Exotic: Fully Naturalised	1
Exotic: Casual	1
<b>Total</b>	<b>3</b>

**Recognition:** The family Davalliaceae comprises terrestrial or epiphytic species with thick, long-creeping rhizomes densely covered in scales, monomorphic or dimorphic fronds that are articulated to phyllopodia, often deltoid-shaped coriaceous laminae, and submarginal sori protected by lunate to pouched indusia (see Nootboom 1994, plates 1–4).

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## ***Davallia* Sm., *Mém. Acad. Roy. Sci. (Turin)*, 5: 414, t. 9, f. 6 (1793)**

**Type taxon:** *Davallia canariensis* (L.) Sm.

**Etymology:** Named in honour of Edmond Davall (1763–1798), a Swiss botanist who bequeathed his herbarium to J.E. Smith, author of the genus.

Epiphytic, rupestral or terrestrial ferns. Rhizomes long-creeping, scaly. Rhizome scales subulate or narrowly ovate, peltate, concolorous (not NZ) or with pale margins and dark centres (NZ), margins entire (not NZ) or toothed (NZ), with or without multiseptate hairs on the margins. Fronds monomorphic or dimorphic, articulated to phyllopodia. Laminae 3-pinnate to 4-pinnate-pinnatifid (NZ) or also pinnatifid to 2-pinnate-pinnatifid (not NZ), coriaceous, glabrous or with scattered scales. Veins free; false veins sometimes present between true veins. Sori oblong or obovate. Indusia attached at base and at least part of the sides, pouched (NZ) to lunate (not NZ). Spores monolete; perispores verrucate, tuberculate or rugose.

**Taxonomy:** A genus of c. 65 species (Tsutsumi et al. 2016; PPG 1 2016).

*Davallia* was revised by Nooteboom (1994, 1998), who recognised 34 species, with 30 species in section *Davallia* and four in section *Scyphularia*. He included species formerly belonging to *Araiostegia*, *Humata* and *Pachypleuria* but retained *Davallodes*, *Leucostegia* and *Gymnogrammitis*. *Leucostegia* is now treated in Hypodematiaceae and *Gymnogrammitis* in Polypodiaceae (PPG 1 2016), but *Davallodes* has been subsumed within *Davallia* (Tsutsumi et al. 2016) as the sole genus within Davalliaceae.

Within New Zealand the indigenous representatives have been reviewed by von Konrat et al. (1999), who recognised a single species, *D. tasmanii*, with subsp. *tasmanii* endemic to the Three Kings Islands, and subsp. *cristata* confined to Puketi Forest in the northern North Island. Two naturalised species, *D. griffithiana* and *D. trichomanoides* (as *D. mariesii*), have subsequently been recorded for New Zealand (Webb et al. 1995), whilst *D. feejeensis* Hook. is commonly cultivated. In the classification proposed by Tsutsumi et al. (2016), *D. tasmanii* is placed in sect. *Scyphularia*, and *D. griffithiana* and *D. trichomanoides* in sect. *Trogostolon*.

- |   |  |                       |
|---|--|-----------------------|
| 1 | Multi-septate hairs present on the margins and apices of the scales of the rhizome and frond; plants confined to Three Kings Islands and Puketi Forest, Northland.....           | <i>tasmanii</i>       |
|   | Multi-septate hairs absent from the margins and apices of the scales of the rhizome and frond; plants of disturbed habitats or escapes from cultivation.....                     | 2                     |
| 2 | Laminae 3-pinnate-pinnatifid to 4-pinnate with very narrow ultimate segments; indusia narrowly oblong, deeply pouched, attached at base and the entire length of both sides..... | <i>trichomanoides</i> |
|   | Laminae 3-pinnate to 3-pinnate-pinnatifid with broad ultimate segments; indusia obovate, shallowly pouched, attached at base and $\frac{2}{3}$ of both sides.....                | <i>griffithiana</i>   |

**Distribution:** *Davallia* occurs in tropical and subtropical regions of the Old World and Pacific, with a few species extending north to temperate parts of south-west Europe, China, and Japan, and south to New Zealand and Kerguelen (Nooteboom 1994). The centre of diversity is in the Malesian region, encompassing about 30 species (Nooteboom 1998), with 17 in China (Xing et al. 2013), four in Australia (Bell 1998), and perhaps 15 in the Pacific region. Three species in New Zealand; one endemic, one naturalised and one casual.

**Biostatus:** Indigenous (Non-endemic).

**Table 2:** Number of species in New Zealand within *Davallia* Sm.

Category	Number
Indigenous (Endemic)	1
Exotic: Fully Naturalised	1
Exotic: Casual	1
<b>Total</b>	<b>3</b>

**Recognition:** In New Zealand, species of *Davallia* can be recognised by their thick, long-creeping rhizomes abundantly covered in scales, fronds articulated to phyllopodia, deltoid-shaped coriaceous laminae, submarginal sori, strongly pouched indusia, and verrucate or tuberculate spores (Large & Braggins 1991).

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**Cytology:** The base chromosome number in *Davallia* is  $x = 40$  (Nootboom 1998).

## ***Davallia griffithiana* Hook., Sp. Fil. 1, 168, t. 49B (1845)**

≡ *Leucostegia griffithiana* (Hook.) J.Sm., *Hist. Fil.* 84 (1875)

≡ *Humata griffithiana* (Hook.) C.Chr., *Contr. U.S. Natl. Herb.* 26: 293 (1931)

Syntypes: Bootan [Bhutan], *W. Griffith s.n.*, K 000061847 (!online); Mishmee, *W. Griffith s.n.*, K 000061848 (!online)

**Etymology:** Named in honour of William Griffith (1810–1845), British physician and botanist, and Superintendent of Calcutta Botanic Garden.

Epiphytic or terrestrial ferns. Rhizomes long-creeping, up to 930 mm long (in herbarium specimens), 2–6 mm in diameter, with stipes arising 10–60 mm apart; densely scaly. Rhizome scales subulate, 6–9 mm long, 0.8–1.6 mm wide at expanded base, peltate, with pale margins and a dark centre, margins bearing setae but lacking multiseptate hairs. Fronds 95–335 mm long. Stipes 50–120 mm long, red-brown proximally, yellow-brown distally, glabrous. Rachises yellow-brown or pale brown, narrowly winged  $\pm$  throughout, sulcate, glabrous. Laminae 3-pinnate or usually 3-pinnate-pinnatifid, deltoid-pentangular or broadly ovate, tapering to a short pinnatifid apex, 45–215 mm long, 35–200 mm wide, yellow-green on both surfaces, coriaceous, glabrous; slightly dimorphic, the fertile laminae more divided and with smaller ultimate segments than the sterile. Primary pinnae in 12–20 pairs below pinnatifid apex, overlapping, narrowly winged except proximally; the distal primary pinnae pinnatifid and narrowly ovate; the proximal pair the largest, 23–110 mm long, 12–75 mm wide, broadly ovate and divided into secondary pinnae, apices acute, bases stalked. Secondary pinnae ovate, narrowly winged, decreasing markedly in length along each primary pinna to its apex; the basal basispic one the largest, 9–60 mm long, 4–25 mm wide, apices acute, bases stalked, divided into tertiary pinnae. Tertiary pinnae ovate or oblong, winged; the longest at or near the base of the secondary pinnae, 3–20 mm long, 1–8 mm wide, apices acute or obtuse, divided more than halfway to midrib, bases stalked. Apices of ultimate fertile lamina segments often bidentate, those of sterile segments acute or obtuse. Sori oblong, terminating veins just inside the pinna margins; indusia obovate, attached at base and  $\frac{2}{3}$ – $\frac{3}{4}$  of both sides forming shallow pouches, 0.8–1.7 mm long, 0.6–1.1 mm wide, apex rounded, ending at or inside the lamina margin, sometimes with a lamina tooth on the outside.

**Distribution:** North Island: Auckland, Taranaki.

Altitudinal range: 25–60 m.

*Davallia griffithiana* is naturalised in parts of Auckland city, around Hamilton, and in Whanganui.

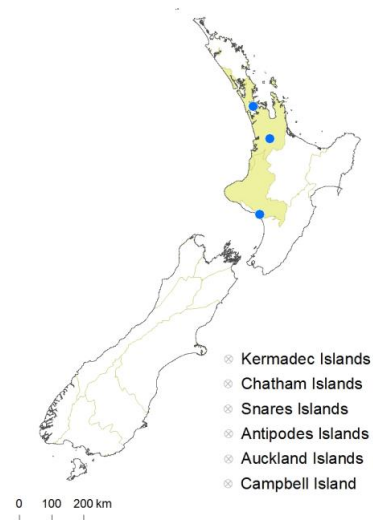
Occurs naturally in India, Tibet, China, Japan, Taiwan, Burma, Laos and Vietnam (Nootboom 1994).

**Biostatus:** Exotic; fully naturalised.

**Habitat:** *Davallia griffithiana* occurs as an escape from cultivation, growing as an epiphyte or on brick, basalt or scoria walls in old gardens, derelict sections or quarry sites.

**First record:** de Lange (1987, p. 58, as *D. fejeensis* complex). Voucher WELT P015604, 1986.

**Recognition:** *Davallia griffithiana* is most easily distinguished from *D. tasmanii* by its rhizome scales, which lack marginal, multiseptate hairs. The fronds of the two species are generally rather similar. However, the indusia of *D. griffithiana* are obovate with rounded apices and attached along  $\frac{2}{3}$ – $\frac{3}{4}$  of both sides to form shallow pouches (Nootboom 1994, fig. 12), whereas in *D. tasmanii* they are oblong, truncate at the apex and attached along all of both sides to form deep pouches (von Konrat et al. 1999, fig. 3). In *D. trichomanoides*, the sori are placed further from the lamina margin and protected by indusia, which are narrowly oblong, attached along all of both sides and truncate or only slightly rounded at the apices (Nootboom 1994, fig. 30). *D. griffithiana* is further distinguished from *D. trichomanoides* by its less divided frond with broader ultimate segments.



**Fig. 1:** *Davallia griffithiana* distribution map based on databased records at AK, CHR & WELT.





**Fig. 2:** *Davallia griffithiana*. Abaxial surface of fertile frond showing pouched indusia.



**Fig. 3:** *Davallia griffithiana*. Adaxial surface of fertile frond.



**Fig. 4:** *Davallia griffithiana*. Habit of plant, spreading by means of long-creeping rhizomes.



**Fig. 5:** *Davallia griffithiana*. Long-creeping rhizome densely covered in scales.



**Fig. 6:** *Davallia griffithiana*. Herbarium specimen of a cultivated plant, WELT P017962/A, showing the slightly dimorphic fertile and sterile laminae.



**Fig. 7:** *Davallia griffithiana*. Close up of WELT P017962/A showing the obovate indusia with rounded apices, attached along  $\frac{2}{3}$ – $\frac{3}{4}$  of both sides.

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## ***Davallia tasmanii* Field, *Ferns New Zealand* 75, t. 24, f. 5 (1890)**

as "*D. tasmani*"

Holotype: Plate XXIV, fig. 5 in Field, *Ferns of New Zealand* (1890) – see von Konrat et al. (1999)

= *Davallia tasmanii* Cheeseman, *Trans. & Proc. New Zealand Inst.* 23: 416 (1891) nom. illeg., non *Davallia tasmanii* Field 1890 – as *D. tasmani*

Lectotype (selected by von Konrat et al. 1999): Three Kings Islands, *T.F. Cheeseman*, Aug. 1887, AK 419! Isolectotypes AK 10811!, 10812!, 10814!, WELT P007162!

**Etymology:** Named in honour of Abel Janszoon Tasman (1603–1659), Dutch navigator who named the Three Kings Islands, from where this species was described.

Epiphytic or terrestrial ferns. Rhizomes long-creeping, up to 175 mm long (in herbarium specimens), 3–7 mm in diameter, with stipes arising 5–35 mm or more apart; densely scaly. Rhizome scales narrowly ovate, 6–12 mm long, 1.0–1.5 mm wide, peltate, with pale margins and dark brown centres, bearing setae along both margins and multiseptate hairs either along both margins or restricted to the apex. Fronds 110–370 mm long. Stipes 35–175 mm long, red-brown proximally, sometimes becoming yellow-brown distally; bearing scattered narrowly ovate scales up to 5 mm long and 0.5 mm wide, with pale margins and dark brown centres, toothed and with multicellular and glandular hairs on their margins. Rachises red-brown or yellow-brown or pale brown, winged in distal half, sulcate, bearing scattered ovate scales up to 2 mm long and 0.5 mm wide, with abundant long multicellular hairs on their margins. Laminae 3-pinnate to 4-pinnate-pinnatifid, but usually 3-pinnate-pinnatifid, deltoid-pentangular or broadly ovate or broader than long, tapering to a short pinnatifid apex, 50–210 mm long, 67–255 mm wide, yellow-green on both surfaces, coriaceous, bearing ovate or broadly ovate scales up to 1 mm long and 0.5 mm wide with abundant marginal cilia. Primary pinnae in 7–12 pairs below pinnatifid apex, overlapping, winged except proximally; the distal primary pinnae pinnatifid and narrowly ovate; the proximal pair the largest, broadly ovate and divided into secondary pinnae, 41–142 mm long, 25–115 mm wide, apices acute, bases stalked. Secondary pinnae ovate, narrowly winged, decreasing markedly in length along each primary pinna to its apex; the basal basicopic one the largest, 18–83 mm long, 9–56 mm wide, apices acute, bases stalked, divided into tertiary pinnae. Tertiary pinnae ovate, winged; the longest at or near the bases of the secondary pinnae, 6–35 mm long, 4–19 mm wide, apices acute or obtuse, divided halfway to all the way to the midrib, bases stalked. Quaternary pinnae ovate, up to 12 mm long and 5 mm wide, sometimes divided more than halfway to midrib. Ultimate fertile lamina segments truncate or bidentate; ultimate sterile segments acute or obtuse. Sori oblong, terminating veins just inside pinna margins; indusia oblong or elliptic, attached at base and along both sides forming a deep pouch, 1.2–2.0 mm long, 0.8–1.4 mm wide, apex ± truncate or slightly rounded.

- 1 Rhizome scales bearing multicellular hairs along both margins.... subsp. *tasmanii*  
.....  
Rhizome scales bearing multicellular hairs only at their apices..... subsp. *cristata*

**Distribution:** North Island: Northland.

Three Kings Islands.

Altitudinal range: 30–300 m.

*Davallia tasmanii* is known only from the Three Kings Islands and from one site in Puketi Forest, Northland.

**Biostatus:** Indigenous (Endemic).

**Habitat:** *Davallia tasmanii* is primarily a terrestrial species found on rocky banks, rock outcrops and scree slopes in exposed situations or under coastal scrub. Occasionally it is also found as an epiphyte.

**Recognition:** *Davallia tasmanii* is readily distinguished from the two naturalised species in New Zealand by the presence of multiseptate hairs on the rhizome scales. It is further distinguished by its indusia, which are oblong, attached along all of both sides, and truncate at the apex (von Konrat et al. 1999, fig.3), whereas in *D. griffithiana* they are obovate with rounded apices and only attached along  $\frac{2}{3}$ – $\frac{3}{4}$  of both sides (Nooteboom 1994, fig. 12), and in *D. trichomanoides* they are narrowly oblong and truncate or slightly rounded at the apices (Nooteboom 1994, fig. 30).

**Notes:** The publication of the name *Davallia tasmanii* by Field (1890) predates that of Cheeseman (1891) by a few months and is the earliest name for this species.

Nooteboom (1994) noted that *D. tasmanii* closely resembled *D. canariensis* from North Africa and south-west Europe, and suggested that further research was needed to determine whether it was derived from an early introduction. However, von Konrat et al. (1999) showed that there were many constant morphological characters to distinguish the two species, and Tsutsumi et al. (2016) noted that the two species belonged in different sections of *Davallia*.

## ***Davallia tasmanii* subsp. *cristata* von Konrat, Braggins & de Lange, *New Zealand J. Bot.* 37: 586 (1999)**

Holotype: Northland, Puketi Forest, A.E. Wright 7904, 9 Dec. 1987, AK 211067!

**Etymology:** From the Latin *cristatus* (crested), a reference to the multiseptate hairs, which are restricted to the apex of the rhizome scales, giving them a crested appearance.

Rhizome scales bearing setae along both margins from base to apex, but bearing multiseptate hairs only at the apices. False veins in ultimate lamina segments conspicuous when present, nearly always extending along the length of true veins from near their junction to their ending. Ultimate lamina segments usually bearing only 1 sorus per segment; apices of segments usually truncate.

**Distribution:** Northland.

Altitudinal range: c. 300 m.

*Davallia tasmanii* subsp. *cristata* is known only from one locality in Puketi Forest, Northland, where it was first collected in 1984 (Wright 1985).

**Biostatus:** Indigenous (Endemic).

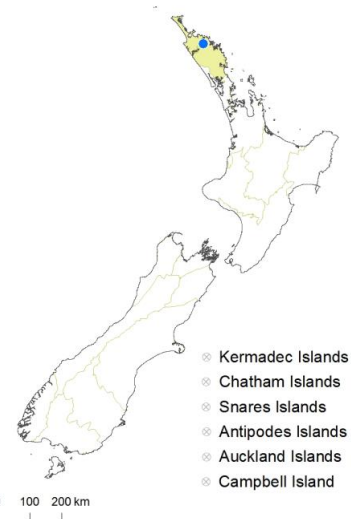
*Davallia tasmanii* subsp. *cristata* was given a conservation status of Nationally Critical by de Lange et al. (2013).

**Habitat:** *Davallia tasmanii* subsp. *cristata* grows on a rock bluff amongst mats dominated by *Metrosideros perforata*, and occasionally climbs *Agathis australis*, *Podocarpus laetus*, *Prumnopitys ferruginea*, and *Weinmannia silvicola* (von Konrat et al. 1999).

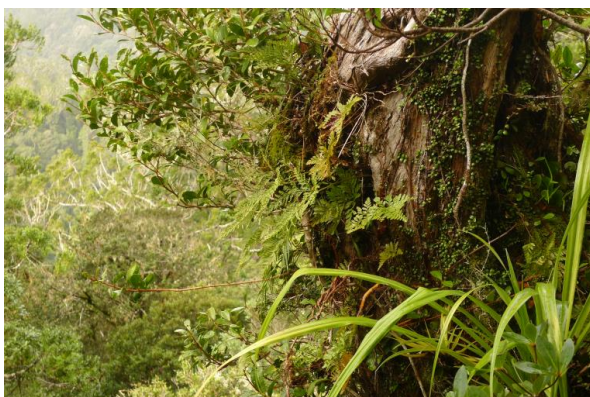
**Recognition:** *Davallia tasmanii* subsp. *cristata* is most easily distinguished by its rhizome scales, which have multiseptate hairs confined to the apices, whereas in *D. tasmanii* subsp. *tasmanii* they occur along both margins from base to apex (see von Konrat et al. 1999, fig. 4).

**Cytology:**  $2n = 79$ , c. 76–80 (von Konrat et al. 1999).

**Notes:** Fertile fronds are apparently rare in the wild and have been collected only once (AK 211067), although they have been seen in cultivation.



**Fig. 8:** *Davallia tasmanii* subsp. *cristata* distribution map based on databased records at AK, CHR & WELT.



**Fig. 9:** *Davallia tasmanii* subsp. *cristata*. Habit of plant climbing on a large trunk.



**Fig. 10:** *Davallia tasmanii* subsp. *cristata*. Sterile frond showing deltoid-pentangular outline.



**Fig. 11:** *Davallia tasmanii* subsp. *cristata*. Long-creeping rhizome densely covered in scales.

## ***Davallia tasmanii* Field, *Ferns New Zealand* 75, t. 24, f. 5 (1890) subsp. *tasmanii***

**Etymology:** Named in honour of Abel Janszoon Tasman (1603–1659), Dutch navigator who named the Three Kings Islands, from where this species was described.

Rhizome scales bearing setae and multiseptate hairs along both margins from base to apex. False veins in ultimate lamina segments absent or faint, rarely extending halfway along length of true veins from their junction to their ending. Ultimate lamina segments bearing 1 to several sori; apices of segments usually notched or bidentate.

**Distribution:** Three Kings Islands.

Altitudinal range: 30–220 m.

*Davallia tasmanii* subsp. *tasmanii* is endemic to the Three Kings Islands, where it is known from Great, North East, West and South West Islands (von Konrat et al. 1999).

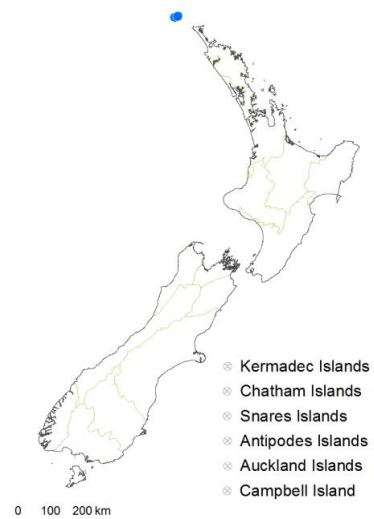
**Biostatus:** Indigenous (Endemic).

*Davallia tasmanii* subsp. *tasmanii* was given a conservation status of Naturally Uncommon by de Lange et al. (2013).

**Habitat:** *Davallia tasmanii* subsp. *tasmanii* is primarily a terrestrial species found on rocky banks, rock outcrops and scree slopes in exposed coastal situations, scrambling over fallen trunks and boulders, under coastal scrub, on forest margins, or under kānuka forest. It favours drier, more open sites. Very occasionally it is also found as a low epiphyte.

**Recognition:** *Davallia tasmanii* subsp. *tasmanii* is most easily distinguished by its rhizome scales, which bear multiseptate hairs along both margins from base to apex, whereas multiseptate hairs are confined to the apices in *D. tasmanii* subsp. *cristata* (see von Konrat et al. 1999, fig. 4).

**Cytology:** n = 40 (Brownlie 1961); 2n = 80 (von Konrat et al. 1999).



**Fig. 12:** *Davallia tasmanii* subsp. *tasmanii* distribution map based on databased records at AK, CHR & WELT.



**Fig. 13:** *Davallia tasmanii* subsp. *tasmanii*. Sterile plants growing on the ground in leaf litter.



**Fig. 14:** *Davallia tasmanii* subsp. *tasmanii*. Fertile and sterile fronds on a climbing plant.



**Fig. 15:** *Davallia tasmanii* subsp. *tasmanii*. Fertile fronds on a mature plant.



**Fig. 16:** *Davallia tasmanii* subsp. *tasmanii*. Mature plant with sterile and fertile fronds climbing kōnuka trunk.



**Fig. 17:** *Davallia tasmanii* subsp. *tasmanii*. Close up of herbarium specimen from Three Kings Islands, WELT P024845, showing mature oblong indusia with truncate apices, joined along all of both sides.



**Fig. 18:** *Davallia tasmanii* subsp. *tasmanii*. Close up of herbarium specimen from Three Kings Islands, WELT P024844, showing mature oblong indusia with truncate apices, joined along all of both sides.

## *Davallia trichomanoides* Blume, *Enum. Pl. Javae* 2, 238 (1828)

Holotype: Java, *Blume s.n.*, L 0051487 (!online)

= *Davallia mariesii* T.Moore ex Baker, *Ann. Bot.* 5: 201 (1891) nom. illeg., non *Davallia mariesii* H.J.Veitch 1880

Type: Japan, in Hort. Veitch, nos.1878, 1879, Herb. T. Moore, K 000061859–000061860 (!online; see Nootboom 1994)

**Etymology:** From the Greek *Trichomanes* (a filmy fern), and *-oides* (like).

**Distribution:** North Island: Northland

Altitudinal range: 10 m.

Known only from one collection at Rāwene, Hokianga.

Occurs naturally from India and China to Japan and south-east Asia (Nootboom 1998).

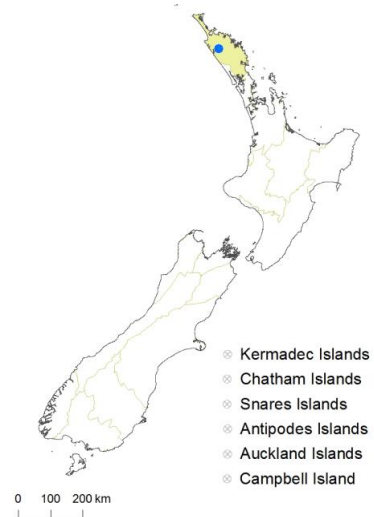
**Biostatus:** Exotic; casual.

**Habitat:** Recorded from a small, sterile patch on an open clay bank under native shrubs as a probable escape from cultivation.

**First record:** Webb et al. (1995, p. 152, as *D. mariesii*). Voucher WELT P015795, 1987.

**Recognition:** *Davallia trichomanoides* is known in the wild only from a single juvenile, sterile collection but it also occurs in cultivation. The rhizome scales are very similar to those of *D. griffithiana* in having marginal setae but lacking the multiseptate hairs of *D. tasmanii*. Cultivated fronds are generally larger and more divided than in *D. griffithiana*, usually 4-pinnate rather than 3-pinnate-pinnatifid, and the ultimate segments are narrower. *Davallia trichomanoides* is most easily distinguished when fertile. The sori are oblong and terminate the veins well inside the pinna margins. The indusia are narrowly oblong and attached at the base and along the whole of both sides, forming deep pouches, 1.2–1.7 mm long, 0.6–0.8 mm wide; the apex is truncate or slightly rounded, ending inside the lamina margin, usually with a lamina tooth on one or both sides.

**Notes:** Nootboom (1994) reduced *Davallia mariesii* to synonymy under *D. trichomanoides* but noted that in cultivation it behaved like a good species, and might be best treated as a cultivar with the name 'Mariesii'.



**Fig. 19:** *Davallia trichomanoides* distribution map based on databased records at AK, CHR & WELT.



**Fig. 20:** *Davallia trichomanoides*. Herbarium specimen from Hokianga Harbour, WELT P015795, showing finely dissected sterile fronds.



**Fig. 21:** *Davallia trichomanoides*. Herbarium specimen of a cultivated plant, WELT P017965/A, showing finely dissected fertile frond.



**Fig. 22:** *Davallia trichomanoides*. Herbarium specimen of cultivated plant, WELT P017965/C, showing finely dissected fertile fronds on long-creeping rhizome.



**Fig. 23:** *Davallia trichomanoides*. Close up of WELT P017965/A showing the narrowly oblong indusia with truncate apices, attached along all of both sides.

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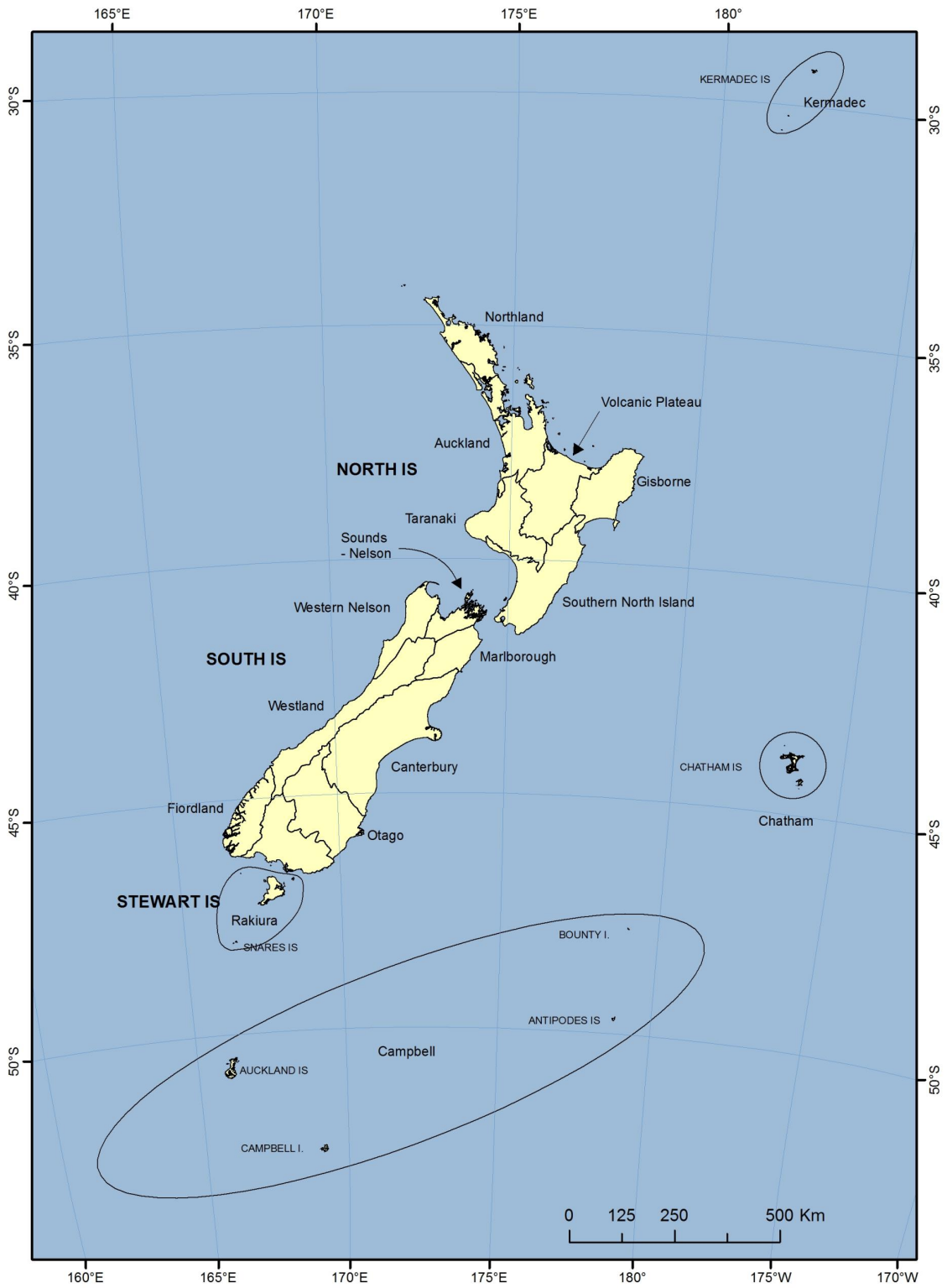
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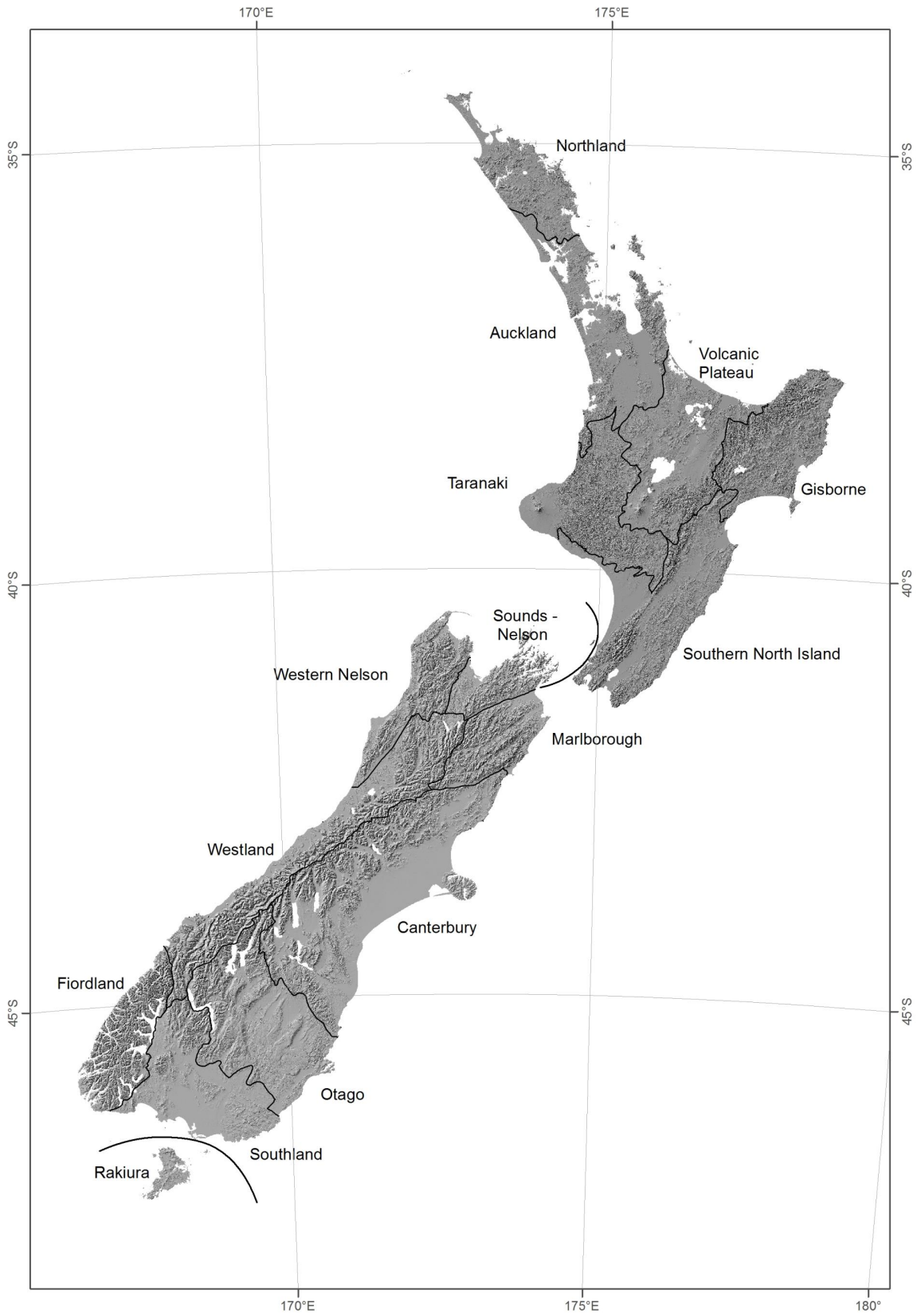
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PatB@tepapa.govt.nz

LeonP@tepapa.govt.nz



**Map 1:** Map of New Zealand and offshore islands showing Ecological Provinces



**Map 2:** Map of New Zealand showing Ecological Provinces

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