Gleichenia inclusisora

COMMON NAMES
tangle fern

BIOSTATUS
Native – Endemic taxon

CURRENT CONSERVATION STATUS
2023 | Not Threatened | Qualifiers: DPR
Jump to previous conservation statuses

CATEGORY
Vascular

STRUCTURAL CLASS
Ferns

SIMPLIFIED DESCRIPTION
Tangle fern. Rhizomatous. Fronds umbrella-like, upper surface green, glossy, undersides white (or blue-green). Sori in clusters of three or four, these embedded up to ¾ of their depth in a small pit in the lower frond surface.

Gleichenia inclusisora, Deep Creek walk, Charleston. Photographer: Melissa Hutchison, Date taken: 14/02/2014, Licence: CC BY-NC.

Gleichenia inclusisora, Deep Creek walk, Charleston. Photographer: Melissa Hutchison, Date taken: 14/02/2014, Licence: CC BY-NC.

DETAILED DESCRIPTION

Terrestrial fern. **Rhizomes** long-creeping, 1–3mm diameter, brown, with stipes arising at intervals of 5–90mm (or more), scaly. **Rhizome** scales sparse to numerous, 0.5–1.2 × 0.5–0.8mm, ovate to orbicular, dark brown to nearly black, margins entire or nearly so, peltate, bullate. **Stipes** 40–1100 mm long, 1.0-2.5mm diameter, widest distally, proximally dark brown, distally straw-green when young or brown when old, glabrous except for occasional, proximal scales that are like those of the rhizome. **Rachis buds** 2.0–3.1 × 1.2–2.1 mm, often not producing a rachis so that fronds form a single tier of pinnae, but sometimes 2–4 tiers, with rachis inter-tier lengths of 15–280 mm. **Rachis bud scales** 1.5–2.5 × 1.0–1.5 mm, ovate, marginate, dark brown with a pale brown or clear margin, ciliate to erose, peltate. **Pinnae** 50–950+ × 50–300 mm, with 0–6 pseudodichotomous branchings. **Pinna buds** similar to rachis buds but generally smaller. **Distal costae (nerves)** appearing tetragonal or nearly so on the adaxial surface, with lateral ridges. **Proximal costae** glabrescent, straw-green when young, brown when old. **Gamma costae** 10–40mm long, with 0–4 pairs of ultimate leaflets; indument similar to beta costae but sparser. **Beta costae** 25–135mm long, with 5–26 pairs of ultimate leaflets and a terminal ultimate leaflet 10–44 mm long; adaxially with long-ciliate, reduced scales that are abundant and orange-brown when young or sparse and white when old; abaxially with a mixture of scales like those on the pinna buds and ultimate segments, glabrescent. **Longest ultimate leaflets** 18–59mm long, with 15–47 pairs of ultimate segments. **Alpha costae** adaxially glabrous (or with occasional reduced scales like those of the beta costae when young), abaxially with scales like those of the ultimate segments. **Ultimate segments** 0.7–1.4 × 0.9–1.4 mm, adaxially green and glabrous, abaxially white (sometimes glaucous) and abundantly (when young) to sparsely scaly, abaxial surface flat to recurved 90° but lateral margins at most only slightly raised (not pouched), apices rounded and revolute. **Scales on abaxial surface of ultimate segments** 0.3–0.8 × 0.3–0.6 mm, orbicular to ovate, with dark brown centre and pale brown margins, long-ciliate, peltate, bullate; similar but larger (to 1.0 mm long), ovate scales covering young ultimate leaflets. **Sori** 0.4–0.5 mm diameter, each comprising three pale yellow sporangia embedded to c. ¾ of their depth in a pit within the abaxial surface of the lamina; one sorus per ultimate segment, in the proximal acroscopic corner. **Spores** trilete, yellow.

SIMILAR TAXA

Gleichenia inclusisora is distinguished from the other three New Zealand species of *Gleichenia* (*G. alpina*, *G. dicarpa* and *G. microphylla*) by the sori which are embedded rather than flush or proud from the lamina; by the bicolorous, orbicular to ovate, peltate scales on the abaxial surfaces of the ultimate segments; by the glabrous stipes; glabrous proximal costae (nerves); by the ultimate segments which are unpouched and abaxially white; and by pinnae that divide pseudodichotomously several times. Of the other three New Zealand species it most often grows with *G. dicarpa* from which *G. inclusisora* can be visually recognised in the field by the shinier upper frond surface, which contrasts strongly with the usually duller *G. dicarpa* upper frond surface.

DISTRIBUTION

Endemic. New Zealand: North and South Islands from Te Moehau to Westland but often absent from large parts of this range.

HABITAT

Lowland to montane (850 m on Te Moehau). Inhabiting pakihi (wet, infertile heaths) and open shrubland/treeland. *Gleichenia inclusisora* has been recorded growing with *G. alpina* and *G. microphylla*, but it is most commonly associated with *G. dicarpa*.

THREATS

Gleichenia inclusisora is known from at least 17 sites collectively occupying an area of >300 square kilometres. As *Gleichenia inclusisora* was a chance discovery (Perrie *et al.* 2012), the naming authors note that it is likely to be found elsewhere in New Zealand (especially now that it has been formally described). Perrie *et al.* (2012) using the New Zealand Threat Classification System (Townsend *et al.* 2007) recommended a conservation status of “At Risk – Naturaly Uncommon” with a qualifier of “RR” [Range Restricted]. This assessment was accepted by the New Zealand Indigenous Vascular Plant Threat Listing Panel (de Lange *et al.* 2013).

GENUS

Gleichenia

FAMILY

Gleicheniaceae

AUTHORITY
Gleichenia inclusisora Perrie, L.D.Sheph., et Brownsey

SYNONYMS
None (first described in 2012)

ENDEMIC TAXON
Yes

ENDEMIC GENUS
No

ENDEMIC FAMILY
No

PROPAGATION TECHNIQUE
Unknown. Probably best left alone.

ETYMOLOGY
gleichenia: After the German naturalist and plant physiologist Wilhelm Friedrich (Baron) von Gleichen (1717-1783)
inclusisora: Inclusus - Latin, meaning enclosed, and here referring to the sori of G. inclusisora being embedded within the lamina

NVS CODE
GLEINC

PREVIOUS CONSERVATION STATUSES
2017 | At Risk – Naturally Uncommon | Qualifiers: DP, RR
2012 | At Risk – Naturally Uncommon | Qualifiers: DP, RR
Jump to current conservation status

REGIONAL CONSERVATION STATUSES
Auckland: 2025 | Regionally At Risk – Regionally Naturally Uncommon | Qualifiers: DPR, DPS, DPT, RR Help
Current regional threat status assessments prepared according to Crisp et al. (2025) are displayed when available. The Auckland conservation status information is sourced from the "Conservation status of vascular plant species in Tāmaki Makaurau / Auckland" Simpkins E et al. (2025) report.

REFERENCES AND FURTHER READING
de Lange PJ, Rolfe JR, Champion PD, Courtney SP, Heenan PB, Barkla JW, Cameron EK, Norton DA, Hitchmough RA. 2013. Conservation status of New Zealand indigenous vascular plants, 2012. *New Zealand Threat Classification Series 3*. Department of Conservation, Wellington, NZ. 70 p. https://www.doc.govt.nz/globalassets/documents/science-and-technical/nztcs3entire.pdf
Perrie LR, Shephard LD, Brownsey PJ. 2012. *Gleichenia inclusisora*, a new and uncommon tangle fern from New Zealand. *New Zealand Journal of Botany 50(4)*: 401–410. https://doi.org/10.1080/0028825X.2012.724015.
Townsend AJ, de Lange PJ, Norton DA, Molloy J, Miskelly C, Duffy C. 2008. New Zealand Threat Classification manual. Department of Conservation, Wellington, NZ. 35 p. https://www.doc.govt.nz/globalassets/documents/science-and-technical/sap244.pdf

ATTRIBUTION
Fact Sheet Prepared for NZPCN by P.J. de Lange (4 January 2013). Description from Perrie *et al.* (2012).

MORE INFORMATION
https://www.nzpcn.org.nz/flora/species/gleichenia-inclusisora/

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21 July 2026