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Taeniophyllum northlandicum (Orchidaceae) – reporting on a new population and the first confirmed indigenous host species

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Abstract

A third population of the epiphytic *Taeniophyllum northlandicum* (Orchidaceae) is reported for Aotearoa / New Zealand from Te Tai Tokerau / Northland, near Ngunguru, on the Tutukākā Coast. This population is notable, as the orchid occurs there on indigenous host plants, whereas all past reported host occurrences of this species are from exotic shrubs and trees. The new population suggests that *T. northlandicum* persists and reproduces within indigenous ecosystems. This population also demonstrates that the species appears to favour habitats of high humidity, much like the northern population, which occurs within riparian conditions. This recent discovery expands the potential habitat types for this species and indicates that additional populations may be found in similar wetland ecosystems. Currently, *Taeniophyllum northlandicum* is accepted as an endemic species to Aotearoa, though it was originally considered conspecific with the Norfolk Island endemic *T. norfolkianum*. The discovery reported here adds to the body of evidence supporting the view that *T. northlandicum* is a recent arrival to Aotearoa rather than endemic.

Keywords

Orchid, *Taeniophyllum*, *T. northlandicum*, *T. norfolkianum*, *T. muelleri*, taxonomy, new population, epiphyte, Aotearoa / New Zealand flora

Introduction

Taeniophyllum northlandicum R.Rice et M.A.M.Renner (Orchidaceae) is a leafless, epiphytic orchid within the Vandeae tribe. This species is easily recognised in Aotearoa / New Zealand (hereafter Aotearoa) as it is the only apparently leafless epiphytic orchid in the country (Teoh 2022). First discovered in late 2009 near Waipū, Te Tai Tokerau / Northland, specimens were originally interpreted as a recent colonisation of *T. norfolkianum* D.L.Jones, B.Gray et M.A.Clem, which was otherwise thought to be endemic to Norfolk Island (Beadel et al. 2010). Later, however, Rice (2019) described these Aotearoa specimens as a new endemic species, *T. northlandicum*, based on their smaller size and less extensive root system, conspicuously papillate rhacis, inflorescences with fewer flowers, slender triangular petals and sepals, and a labellum that has a saccate base, while apically, it is prominently 3-lobed with a longer, thicker and recurved apical horn. The threat status for the Aotearoa *Taeniophyllum* was accordingly updated from "Non-resident Native – Coloniser" to "Threatened – Nationally Critical" (de Lange et al. 2024).

The Waipū population consisted of approximately 140 individuals growing on the branches and trunks of gorse (*Ulex europaeus* L.) plants (Beadel et al. 2010) on retired pasture within a matrix of indigenous secondary scrub dominated by *Kunzea robusta* de Lange et Toelken, *Schefflera digitata* J.R.Forst. et G.Forst., *Melicytus ramiflorus* J.R.Forst. et G.Forst. and *Alsophila dealbata* (G.Forst.) Corda (Renner & Beadel 2011). In 2021 a second population of *Taeniophyllum northlandicum* was discovered on an orchard east of Kaitaia, where plants were found growing on feijoa (*Acca sellowiana* (O.Berg) O.Berg), apple (*Malus* × *domestica* Borkh.) and southern magnolia (*Magnolia grandiflora* L.) (Campbell 2023). The second population provided no insight into habitat requirements for *Taeniophyllum northlandicum* in indigenous ecosystems, as all individuals grew on exotic hosts (Campbell 2022). It was clear that only the discovery of *T. northlandicum* growing on indigenous host species would clarify any ecological context of this

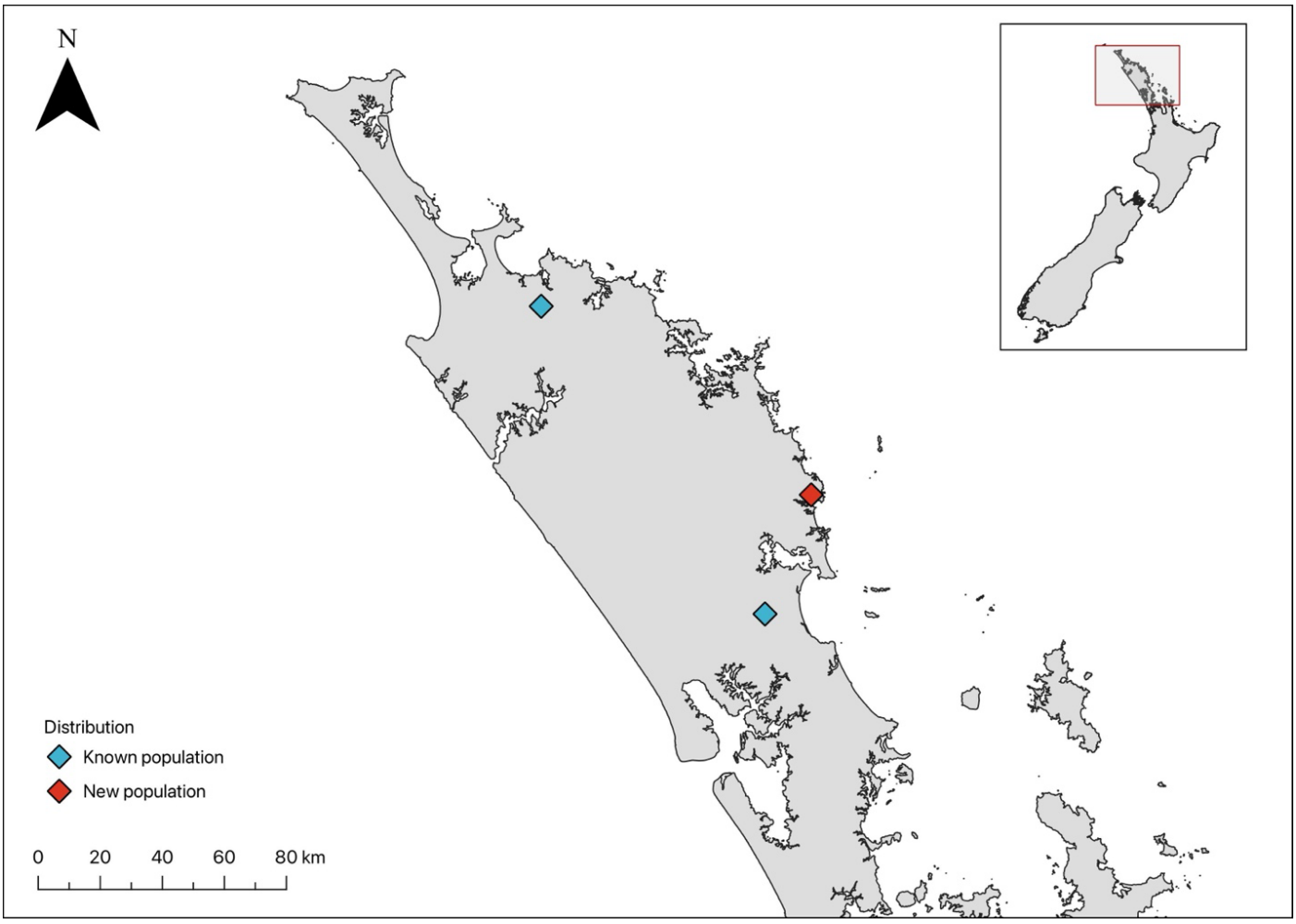


Figure 1. The approximate locations of the three known populations of *Taeniophyllum northlandicum*.

species within Aotearoa. It has been speculated that undiscovered plants – potentially growing on indigenous hosts – are likely overlooked due to their small size, but are expected to occur (de Lange 2025).

On 11 October 2025 a third population of *Taeniophyllum northlandicum* was discovered on a private property in Ngunguru, on the Tutukākā Coast of Te Tai Tokerau (Figure 1). This discovery extends the distribution, habitat and ecology of this species into an indigenous environment, which is reported here with a description of the occupied habitat and first confirmation of indigenous host species. Additionally, observations of the population structure, growth habit and morphological variation are described.



Figure 2. The marginal wetland scrub habitat dominated by *Leptospermum hoipolloi* fo. *hoipolloi* where the *Taeniophyllum northlandicum* were discovered.

Observations

Habitat and ecology

The site is located within a broad valley system that was likely once a continuous wetland extending out to the Ngunguru Estuary before it was drained and converted to pasture. The subject land occupies some of these lowland flats and is surrounded by steeper topography. The steeper areas of this section have been utilised for low-intensity grazing, but in the lower flats there are fragments of wetland forest that have not recently been subjected to draining or grazing pressures. It was within the margin of these wetland forest fragments that the new population of *Taeniophyllum northlandicum* was observed.

Some areas of this wetland forest are very poorly drained and subject to surface pooling. This variation in hydrology results in a mosaic of vegetation types, with the wettest areas not supporting a continuous canopy and consisting of *Carex* L. and *Machaerina* M.Vahl. sedgelands, while the drier portions support mānuka scrub and broadleaf–podocarp forest. The vegetation of the wettest areas with surface pooling consists of distinct patches dominated by *Carex lessoniana* Steud., *Carex virgata* Sol. ex Boott, *Sparganium subglobosum* Morong and *Machaerina rubiginosa* (Spreng.) Koyama, and are frequently interspersed with *Parablechnum novae-zelandiae* (T.C.Chambers et P.A.Farrant) Gasper et Salino and *Ageratina adenophora* (Spreng.) R.M.King & H.Rob. Meanwhile, the margins of these pooled areas are dominated by scrub-forming species, including *Leptospermum hoipolloi* L.M.H.Schmid & de Lange fo. *hoipolloi*, *Coprosma tenuicaulis* Hook.f. and *Dicksonia squarrosa* (G.Forst.) Swartz. Finally, the surrounding vegetated, damp slopes consist of a podocarp–broadleaf forest with a canopy dominated by *Dacrycarpus dacrydioides* (A.Rich.) de Laub., *Hedycarya arborea* J.R.Forst. et G.Forst., *Podocarpus totara* G.Benn. ex D.Don var. *totara* and *Coprosma arborea* Kirk.

Six adult *Taeniophyllum northlandicum* and three seedlings were discovered growing in the marginal scrub habitat on a single *Leptospermum hoipolloi* fo. *hoipolloi* tree (Figure 2). The host tree had a diameter at breast height of 126 mm and was estimated to be approximately 5.5 m tall. This tree was growing in hydric soils in association with indicative wetland species and was adjacent to the metal driveway leading into the section. All observed *T. northlandicum* on this host were east facing – towards the driveway – where additional sunlight is available due to the opening in the canopy. All observed plants were growing on the trunk and branches of the tree 1–2.5 m from the ground.

Population survey

A search of the property was conducted in an effort to locate additional individuals, taking approximately 12 person-hours. Numerous additional *Taeniophyllum northlandicum* were discovered further into the wetland interior, growing on several other indigenous tree hosts. The search found plants growing on five more *Leptospermum hoipolloi* fo. *hoipolloi*, two live *Coprosma tenuicaulis*, two dead and decomposing *C. tenuicaulis*, two *Geniostoma ligustrifolium* A.Cunn. var. *ligustrifolium* and one *Kunzea robusta* de Lange et Toelken (Figure 3). Most of these plants were also found growing on the east-



Figure 3. *Taeniophyllum northlandicum* growing on *Coprosma tenuicaulis* (left) and *Geniostoma ligustrifolium* var. *ligustrifolium* (right).

facing side of their host trees, but a few were found west facing where additional shade was present or growing amongst bryophytes that hold additional moisture. *Coprosma tenuicaulis* and *Geniostoma ligustrifolium* var. *ligustrifolium* only appeared to be suitable hosts where humidity was higher and where there was surface pooling. Most of the confirmed host plants had 1–10 *T. northlandicum* plants, but one of the *G. ligustrifolium* var. *ligustrifolium* had > 20 plants. Finally, the highest specimen was found approximately 3 m from the ground on a branch of *Kunzea robusta*.

Growth habit and plant description

The plants' roots were firmly attached to the outer bark of the host tree, with some instances of roots growing beneath the bark where flaking was in its later stages (Figure 4). One individual had a visible root system extending approximately 40 mm in diameter (Figure 5). This individual was also demonstrating the ability to penetrate beneath the outer bark, with one root re-emerging from beneath bark that was not evidently flaking and reaching about 40 mm from the plant's centre. At the time of observation, the majority of plants were flowering or developing fruit. Several seedlings that were distinctly laterally compressed were observed (Figure 6). Several of the plants on the dead *Coprosma tenuicaulis* had broken off due to the rotting wood, but were persisting at the base of the tree, their roots wrapped around grass (*Isachne globosa* (Thunb.) Kuntze) and fern fronds (*Parablechnum novae-zelandiae*). One of these fallen plants was collected and lodged as a voucher specimen at the Unitec Herbarium (*P.J. de Lange 15897 & T.J.P. de Lange*, UNITEC 15334).

The morphological characteristics of the observed individuals appear to match the description of *T. northlandicum* (de Lange 2025), but with a few notable exceptions. Firstly, all flowers were approximately 2 mm in length compared to the 3.2–3.5 mm length of sepals



Figure 4. A *Taeniophyllum northlandicum* specimen in flower, with approximately half of its root system growing beneath the flaking bark of *Leptospermum hoipolloi* fo. *hoipolloi*.



Figure 5. A mature *Taeniophyllum northlandicum* individual growing on *Leptospermum hoipolloi* fo. *hoipolloi*. Also, a notable occurrence of a root growing beneath the bark and re-emerging.

and petals described by Rice (2019). Secondly, many of the fleshy roots appear to be dorsoventrally flattened rather than terete. Lastly, the roots of some specimens were found to extend approximately 40 mm from the plant compared to the previously documented length of 15–25 mm.



Figure 6. One of the seedlings of *Taeniophyllum northlandicum* growing on *Coprosma tenuicaulis*.

Discussion

This newly discovered population of *Taeniophyllum northlandicum* adds to our understanding of this species' ecology within Aotearoa by demonstrating that this species occupies and reproduces within indigenous ecosystems. This population also demonstrates that the species appears to favour habitats of high humidity, much like the known population in northern Northland that occurs within riparian conditions. This recent discovery expands the potential habitat types for this species and indicates that additional populations may be found in similar wetland ecosystems.

The individuals observed in Ngunguru extend the breadth of morphological variation exhibited by *Taeniophyllum* in Aotearoa. Firstly, the newly discovered plants present flowers of approximately 2 mm long, which is notably shorter than described for *T. northlandicum* and match the description of *T. norfolkianum*. Secondly, the newly discovered plants have longer roots than those described for *T. northlandicum*. Longer-lived host trees could enable these *Taeniophyllum* plants to achieve a more mature state, allowing for a larger root system that can support an inflorescence of more numerous flowers. It could be possible that plants observed in Aotearoa are simply yet to reach their potential size, due to some host species not living long enough (*Ulex europaeus*) or from bark eventually sloughing off plants (*Leptospermum hoipolloi* fo. *hoipolloi* and *Kunzea robusta*). If this is the case, the plants growing on feijoa, apple, magnolia, *Coprosma tenuicaulis* and *Geniostoma ligustrifolium* var. *ligustrifolium* may eventually prove to match the larger growth form described for other

closely allied *Taeniophyllum*. Time will tell as these plants mature further.

A consistent qualitative difference between *T. northlandicum* and *T. norfolkianum* is the texture of the raceme axis, which is papillose in *T. northlandicum* and smooth in *T. norfolkianum*. There are also differences in the shape of the labellum, petals and sepals. These morphological distinctions circumscribe *Taeniophyllum northlandicum* as distinct from *T. norfolkianum*, but not all other members of the variable *T. muelleri* complex. The circumscription of *T. muelleri* has not been fully resolved (Weston 2025), and in southeast Australia there is at least one undescribed but informally named entity that is very similar to *T. northlandicum*, namely *T.* sp. Whian Whian (A.R.Maslin 141) (pronounced 'whine whine') (Renner 2025). *Taeniophyllum* sp. Whian Whian (A.R.Maslin 141) and *T. northlandicum* share the papillate raceme rhacis, smaller stature and yellowish flowers, but the two have not yet been critically compared using morphological or molecular data. It remains possible that these two taxa may prove conspecific; this would be in keeping with a scenario whereby *Taeniophyllum* is a recent arrival in Aotearoa and is actively expanding its distribution here.

The discovery of *Taeniophyllum northlandicum* growing on several indigenous host species confirms that naturally occurring Aotearoa ecosystems are capable of supporting this orchid. The Ngunguru population should be surveyed on a regular basis to further understand three aspects of this species in Aotearoa. Firstly, ongoing surveying could detect further recruitment and proliferation of the population, and could indicate population growth as opposed to a stabilised population. Secondly, monitoring the continued maturation of specimens may inform an improved understanding of morphological variation in Aotearoa *Taeniophyllum*. Thirdly, experimental trials could be undertaken to assess the ability of *Taeniophyllum* to colonise different host species at the Ngunguru site. Establishing the mycorrhizal partner of *Taeniophyllum* at Ngunguru and the distribution of that fungus in forest settings could inform the potential host range. Finally, a DNA-based study to establish the relationships between *T. northlandicum*, *T. norfolkianum* and *T.* sp. Whian Whian should be undertaken to confirm whether *T. northlandicum* is indeed endemic to Aotearoa.

Data Accessibility Statement

No additional database.

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