



Myrsine aquilonia and *M. umbricola* (Myrsinaceae), two new species from New Zealand

P. B. Heenan & P. J. de Lange

To cite this article: P. B. Heenan & P. J. de Lange (2004) *Myrsine aquilonia* and *M. umbricola* (Myrsinaceae), two new species from New Zealand, *New Zealand Journal of Botany*, 42:5, 753-769, DOI: [10.1080/0028825X.2004.9512929](https://doi.org/10.1080/0028825X.2004.9512929)

To link to this article: <http://dx.doi.org/10.1080/0028825X.2004.9512929>



Published online: 17 Mar 2010.



Submit your article to this journal [↗](#)



Article views: 146



View related articles [↗](#)



Citing articles: 3 View citing articles [↗](#)

Myrsine aquilonia and *M. umbricola* (Myrsinaceae), two new species from New Zealand

P. B. HEENAN
Allan Herbarium
Landcare Research
P.O. Box 69
Lincoln 8152, New Zealand

P. J. de LANGE
Science & Research Unit
Department of Conservation
P.O. Box 68908
Newton
Auckland, New Zealand

Abstract *Myrsine aquilonia* and *M. umbricola* are described as new species from New Zealand. *M. aquilonia* occurs on the Poor Knights Islands and at several places on the adjacent Northland Peninsula. It is distinguished from the other New Zealand species of *Myrsine* by an upright growth habit and being up to 12 m tall, spreading branches and branchlets, large-diameter trunk, often producing suckers from exposed roots near the trunk, and large obovate green leaves with a prominent apical notch. *M. aquilonia* is considered to have a conservation status of “At Risk (Sparse)” using the New Zealand Threat Classification System, for while abundant on the Poor Knights Islands it is known from only a few plants at the other Northland locations of Tutukaka, Te Arai, and Unahi.

Myrsine umbricola is known only from silver beech forest in the Tararua Range, lower North Island, where it is sympatric with *M. divaricata*. This species forms a small, bushy shrub up to 4 m tall with slender trunks, and has spreading branches and branchlets and shiny, obovate, dark green leaves. *M. umbricola* is assessed as having a conservation status of “Acutely Threatened (Nationally Endangered)” as

it is known from few subpopulations, is restricted to a small geographic area, and appears to have recruitment failure.

Myrsine divaricata A.Cunn. and *M. ×montana* Hook.f. are lectotypified and this hybrid is attributed to *M. divaricata* × *M. salicina*.

Keywords Myrsinaceae; *Myrsine*; *M. aquilonia*; *M. coxii*; *M. divaricata*; *M. umbricola*; conservation; New Zealand flora

INTRODUCTION

In New Zealand the genus *Myrsine* is represented by nine endemic species (Allan 1961; Heenan & de Lange 1998), with five of these (*M. argentea* Heenan & de Lange, *M. chathamica* F.Muell., *M. coxii* Cockayne, *M. divaricata* A.Cunn., and *M. nummularia* Hook.f.) belonging to the small-leaved *M. divaricata* group. The five small-leaved species also share a circular endocarp, whereas in the other New Zealand species the endocarp is either obovate or elliptic (Webb & Simpson 2001). *M. divaricata* has been considered for some time to be a widespread and variable species, with two variants given tag names by A. P. Druce (in Eagle 1982). One of these, *M. divaricata* form (ii) from Mt Burnett, North-West Nelson, has been named as *M. argentea* (Heenan & de Lange 1998). The other, *M. divaricata* form (i) from the Poor Knights Islands, was referred to by W. R. B. Oliver using the unpublished name “biloba” (WELT 939), and Allan (1961) noted “the status of this form needs further study”. Earlier, Cockayne (1912, p. 27) had referred to plants from the Poor Knights Islands as having “leaves three times the size of those of the usual stations”. These plants were also discussed by Heenan & de Lange (1998) who observed that they differed from most *M. divaricata* sens. str. populations by their “larger leaves, an up right growth habit and conspicuously lenticellate stems”. However, as there was some field evidence that these island plants intergraded with mainland

populations of *M. divaricata*, they considered that taxonomic recognition was premature and that further study was warranted.

Subsequently, de Lange & Cameron (1999) referred some of these mainland "intergrades" from Te Arai (Te Aupouri Peninsula), Unahi (Rangauu Harbour), and Tutukaka (near Whangarei) to the Poor Knights variant as *M. aff. divaricata*. They further observed that Poor Knights plants differed from *M. divaricata* sens. str. by their "generally larger, distinctly coriaceous foliage with markedly less conspicuous leaf glands (when viewed by the naked eye), virgate branching habit, and subtle differences in stigma and anther characters". Nevertheless, the status of other North Island herbarium collections of *M. divaricata* from Woodhill Forest (North Auckland), Hawke's Bay, and the Pohangina River and Mt Holdsworth (Wellington), which approached the Poor Knights plants through their possession of large leaves and the near lack of the characteristic weeping habit of *M. divaricata* sens. str., remained unresolved (e.g., CHR 210426, CHR 210458).

Since 1998 we have continued our observations, systematic collection, and cultivation of *M. divaricata* specimens from throughout New Zealand. From these observations we conclude that many of the "intergrading" collections from Woodhill Forest, Hawke's Bay, and Pohangina River are merely shade-induced forms of *M. divaricata* sens. str., though some of these plants, notably those sampled from Woodhill Forest and Hawke's Bay, are genetically fixed, having retained their slightly larger leaves and slightly less weeping and less divaricating growth habit. Nevertheless, all of these large-leaved variants, with the exception of the Mt Holdsworth plants, can be placed within *M. divaricata* because they possess the characteristic weeping and divaricating growth habit and other diagnostic vegetative features of this species.

The large-leaved specimens from Mt Holdsworth, and other parts of the Tararua Range, have a unique growth form and vegetative characters and, furthermore, proved on field inspection to be sympatric with *M. divaricata* sens. str. For these reasons we consider that they represent another unnamed species of *Myrsine*. Previously, all specimens of the Tararua Range *Myrsine* have been identified as *M. divaricata*. It is very surprising that a new species of *Myrsine* is recognised from the Tararua Range as this area has been very well botanised for nearly a century now (e.g., Petrie 1908; Aston 1910; Zotov et al. 1939). It also transpires that the late A. P. Druce (1920–1999), who made extensive collections from

this mountain range, was aware of the unusual *Myrsine* plants on Mt Holdsworth. However, although sufficiently troubled by their growth habit and morphology to discuss them in the field (D. R. Given pers. comm.), annotations on herbarium sheets at CHR indicate that Druce considered them to be *M. divaricata* growing in heavy shade.

The outcome of our more recent field observations of *Myrsine* is that we have now resolved the status of the large-leaved northern plants from the Poor Knights Islands, adjacent coastline, and the far north, as well as those plants from the Tararua Range. Here we formally name and describe these as new species.

TAXONOMY

Myrsine L., *Sp. Pl.* 1: 196 (1753)

Myrsine aquilonia de Lange et Heenan, sp. nov.

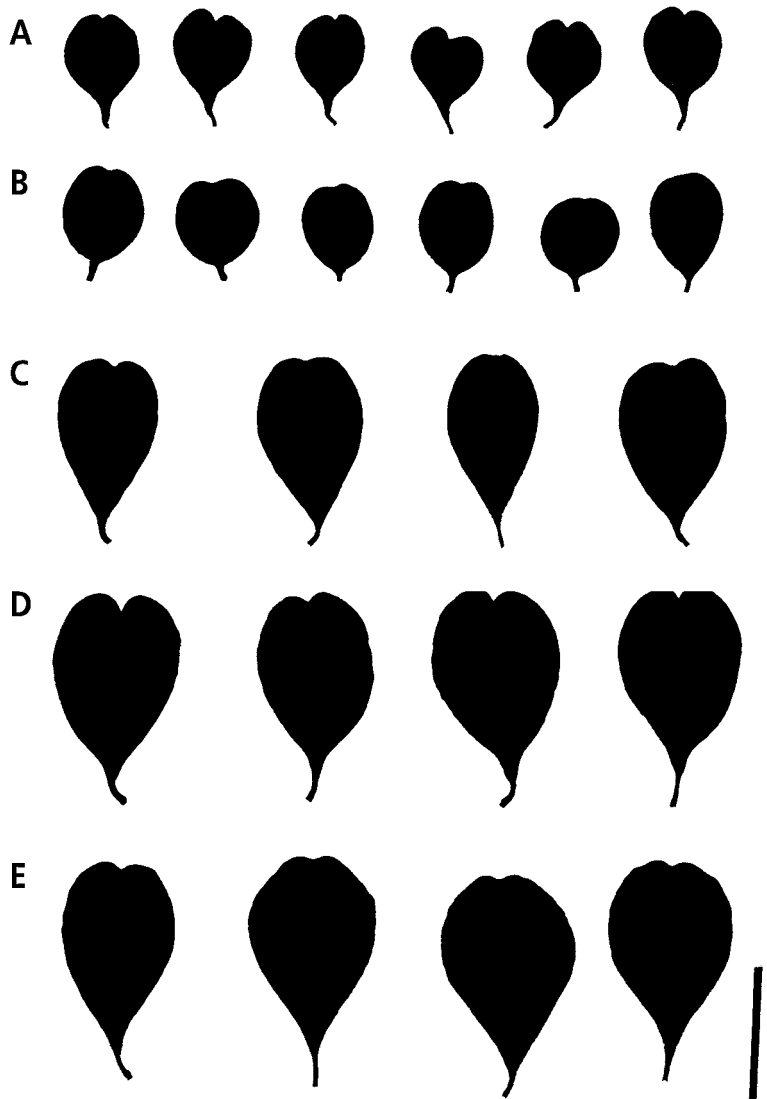
DIAGNOSIS: *A. M. coxio* facie fruticosa et foliosa usque ad 12 m elato trunco lato ramibus effusis, absentia rhizomatorum foliisque nitidis differt.

HOLOTYPE: New Zealand, North Island, Poor Knights Ecological Region and District, Poor Knights Islands, Aorangi Island, Puweto Valley; *P. J. de Lange*, 25 October 1995, AK 226841 (fruiting specimen). Isotypi: CHR, K, MO.

DESCRIPTION (Fig. 1–5): Evergreen, upright, dioecious, shrub or small tree, up to 12 m tall. Shrubs with several main stems, often densely branched, suckering extensively when roots are exposed. Trees erect, with one to several main trunks, trunks up to 45 cm basal diam., with prominent ring-like constrictions at base, branch junctions, and between main branches; outer bark grey, smooth to slightly rough; inner bark, when exposed, pink to grey-pink; inner wood, when exposed, rose-pink. Branchlets aggregated toward branch ends, sparse to crowded, virgate, spreading to upright, not divaricating or drooping, slender, branching angle 30–80°, sparsely to moderately lenticellate, leaves moderately to densely covered with simple and branched hairs when young, becoming glabrous with age.

Seedling stem sparsely to densely covered with simple and branched hairs, conspicuously lenticellate; primary branchlets ± patent to main stem; leaves 10–34 × 8–22 mm, obovate, apex retuse with a prominent cleft or toothed to sometimes praemorse, margin and lamina with conspicuous orange glands, base attenuate.

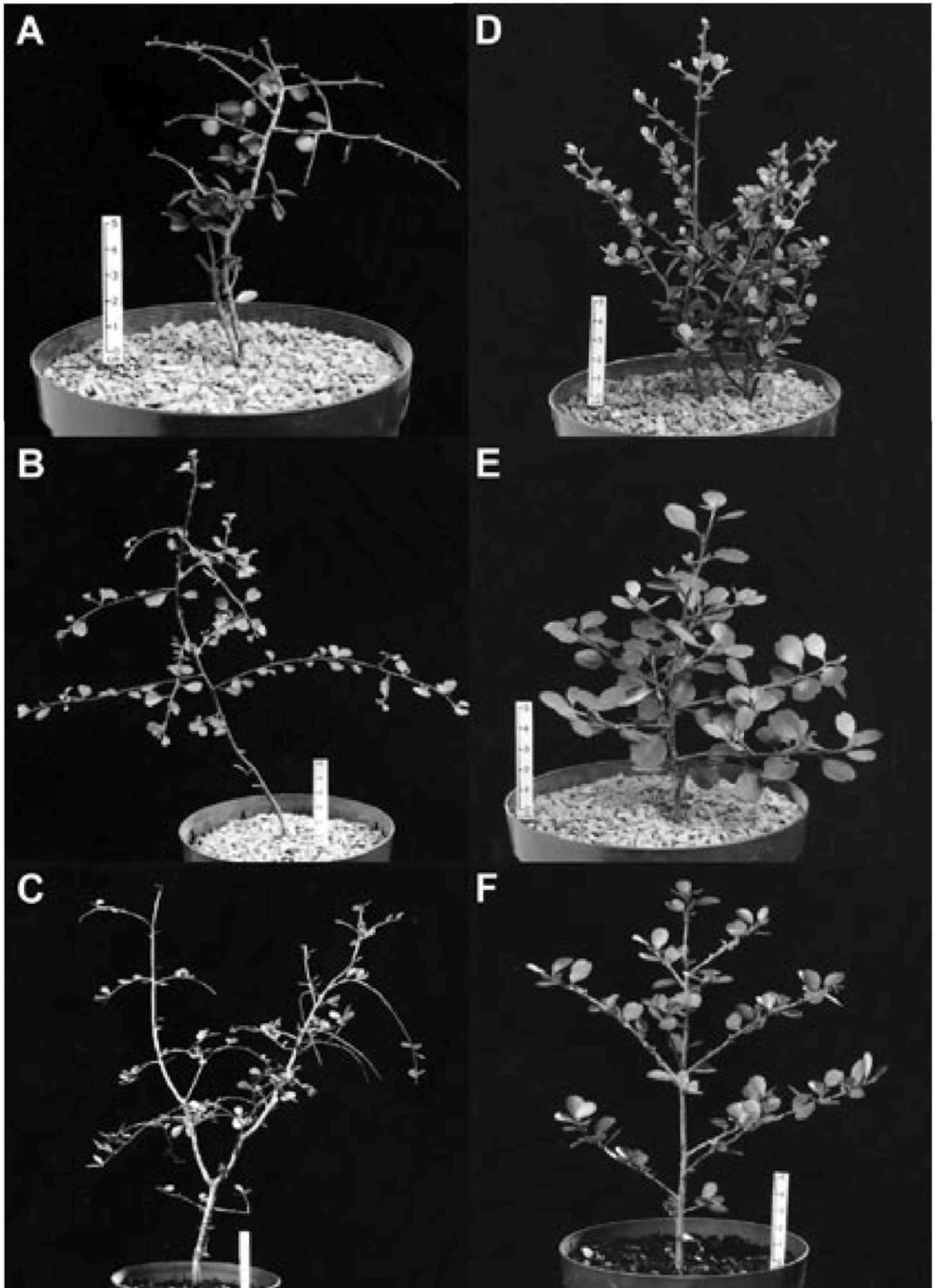
Fig. 1 Leaves. A, *M. divaricata*; B, *M. argentea*; C, *M. umbricola*; D, *M. aquilonia*; E, *M. coxii*; F, *M. chathamica*. Scale bar = 20 mm.



Over page:

Fig. 2 Juvenile plants. A, *M. divaricata* (Cobb River, Nelson); B, *M. divaricata* (Woodhill Forest, North Auckland); C, *M. divaricata* (Mt Holdsworth, Tararua Range, Wellington); D, *M. argentea* (Mt Burnett, Nelson); E, *M. aquilonia* (Aorangi Island, Poor Knights Islands); F, *M. umbricola* (Mt Holdsworth, Tararua Range, Wellington). *M. divaricata* (C) and *M. umbricola* (F) were growing 1 m apart on Mt Holdsworth.





Leaves 12–28 × 10–17 mm, yellow-green when immature, light green to green when mature, without a prominent dark blotch at lamina base, obovate, coriaceous, alternate on branchlets or brachyblasts; glands orange, conspicuous on lamina and margin of immature leaves, conspicuous on margin of abaxial surface when mature or dry; apex deeply retuse to obcordate, rarely praemorse, cleft up to 2 mm deep; margin entire, sometimes slightly repand; base attenuate to shortly attenuate; petiole 1.7–2.2 mm long, plano-convex; simple and branched hairs on petiole, leaf margin, base of midrib, apex, and proximal end of lamina becoming glabrous or glabrate with maturity.

Flowers axillary, solitary or in fascicles of up to 6, often densely crowded on brachyblasts. Female flowers: peduncles 0.7–0.9 mm long; subtended by a triangular bract, 0.6–0.7 × 0.5–0.6 mm, green, apex subacute, margin fimbriate; sepals 4, usually free but sometimes slightly fused at the base, 0.9–1.1 × 0.7–0.9 mm, green, triangular, abaxial and adaxial surfaces glabrous, apex subacute, margins fimbriate; petals 4, free, 1.6–1.7 × 1.0–1.1 mm, broadly elliptic, green and often flushed maroon, upright and recurved at apex at maturity, abaxial and adaxial surfaces glabrous and with a few orange glands, claw indistinct or <0.3 mm long, apex obtuse, margin fimbriate; ovary 1.1–1.2 × 0.9–1.0 mm, usually with conspicuous glands; style distinct, 0.2–0.3 mm long; stigma 0.6–0.8 × 0.6–0.8 mm, spherical, globular; anthers sessile, rudimentary, 0.6–0.7 × 0.4–0.5 mm, apices with a tuft of hairs, pollen absent. Male flowers: peduncles 0.7–1.0 × 0.6–0.7 mm; subtended by a broad triangular bract, 0.2–0.4 × 0.6–0.9 mm, green, apex subacute, margin fimbriate; sepals 4, usually free but sometimes slightly fused at the base, 0.9–1.1 × 0.7–0.8 mm, green, triangular, abaxial and adaxial surfaces glabrous, apex subacute to obtuse, margins sparsely fimbriate or glabrate; petals 4, free, 2.5–2.8 × 1.2–1.3 mm, obovate, green and often flushed maroon, spreading from base and recurved at anthesis, abaxial and adaxial surfaces glabrous and with scattered orange glands, claw 0.8–0.9 mm long, apex subacute to obtuse, margins fimbriate; filaments absent, anthers sessile, attached about half-way along petal; anthers 1.2–1.5 × 0.6–0.8 mm, apices with a tuft of hairs; gynoecium rudimentary, ovary c. 0.5 × 0.5 mm, stigma c. 0.2 × 0.2 mm.

Fruit a drupe. Mesocarp green when immature, style base persistent; at maturity 3.8–4.7 × 3.5–4.7 mm, circular or sometimes broadly elliptic, purple or violet. Endocarp 2.4–3.6 × 3.2–3.3 mm, usually circular, terete, light yellow-green to cream-

brown with paler ± indistinct longitudinal veins. FL Aug; FT Dec–Jan.

Chromosome number $2n = 46$ (Murray & de Lange 1999; AK 223416).

REPRESENTATIVE SPECIMENS: NEW ZEALAND: NORTHLAND: Aupouri Peninsula, Te Arai (The Island Road), *P. J. de Lange & G. M. Crowcroft*, 7 Sep 1996, AK 229092; Rangaunu Harbour, Unahi, *P. J. de Lange & G. M. Crowcroft*, 7 Sep 1996, AK 229091; Rauhomaumau Island, *A. E. Wright 3601*, 2 Sep 1980, AK 157349. POOR KNIGHTS ISLANDS: *L. Cockayne*, Feb 1905, WELT 938; *W. R. B. Oliver*, 11 Dec 1924, WELT 35353; *A. T. Pycroft*, Jan 1932, AK 106060; Aorangi Island, *L. M. Cranwell*, 19 Nov 1933, AK 10606; *W. R. B. Oliver*, 24 Feb 1934, WELT 939/940; Aorangi Island, *G. N. Park*, 2 Jan 1978, CHR 275866; Aorangi Island, west of Tatua Peak, *E. K. Cameron 5083*, 27 Oct 1988, AK 208660; Aorangi Island, Oneho Hill, *A. E. Wright 8412*, 27 Oct 1988, AK 182838; Aorangi Island, *P. J. de Lange 2261*, 20 Dec 1993, CHR 497854; Aorangi Island, *P. J. de Lange*, 24 Oct 1995, CHR 487614, AK 226840; Aorangi Island, *P. Heenan, P. J. de Lange, & E. K. Cameron*, 7 Aug 1996, CHR 511655; Aorangi Island, Tatua Peak, *E. K. Cameron 8477 & P. J. de Lange*, 6 Aug 1996, AK 226879; Tawhiti Rahi, *B. S. Parris*, 1 Aug 1968, AK 128046; *A. E. Wright 11420*, 23 Apr 1991, AK 20167.

DISTRIBUTION (Fig. 6): *Myrsine aquilonia* has a distribution centred on the Poor Knights Islands, where the largest populations occur on the two main islands of that archipelago, Tawhiti Rahi and Aorangi (de Lange & Cameron 1999). It is also found on all the main, well-vegetated islets and rock stacks adjacent to Tawhiti Rahi and Aorangi, though it is apparently absent from the more southerly extensions of the archipelago, the Sugar Loaf and High Peak Rocks.

Beyond the Poor Knights Islands, *M. aquilonia* has a sporadic distribution. Occasional plants found on rock stacks adjacent to the Tutukaka Harbour, 20 km west of the Poor Knights Islands, probably owe their origin to seed dispersal from the Poor Knights Islands by birds (de Lange & Cameron 1999). Those plants found at Te Arai (c. 130 km) and Unahi, Rangaunu Harbour (c. 100 km) north-west of the Poor Knights are, perhaps, less easily explained as examples of avian-assisted dispersal.

These occurrences, while seemingly anomalous within the current context of the now highly modified and fragmented Northland indigenous vegetation, may perhaps be onshore remnants of a small group of plants that show former links between

A



B



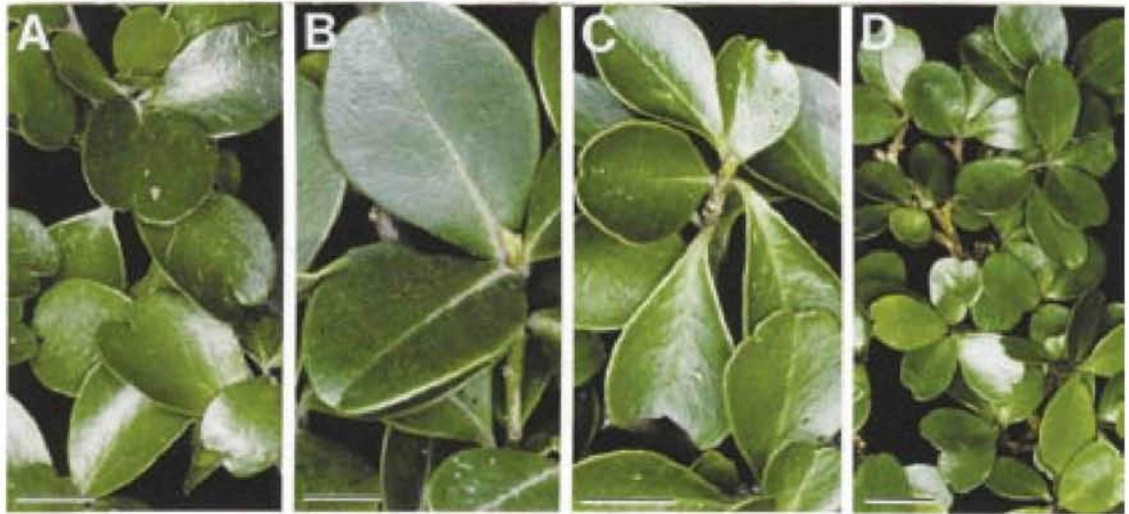


Fig. 4 Leaves. **A**, *M. aquilonia*; **B**, *M. chathamica*; **C**, *M. coxii*; **D**, *M. umbricola*. Scale bars = 10 mm.

Fig. 3 *Myrsine umbricola* (A) and *M. aquilonia* (B). Painted by Audrey Eagle.

the vegetation of the Three Kings Islands, Poor Knights Islands, and other smaller near-shore eastern Northland islands. Other authors, most notably Cranwell (1962), Gardner (1997), de Lange & Cameron (1999), de Lange et al. (1999a), and von Konrat et al. (1999), have discussed the distributions of a number of northern New Zealand plants in relation to the Three Kings Islands, the eastern Northland isthmus, Poor Knights Islands, and other near-shore Hauraki Gulf Islands. These authors proposed that before human occupation and associated forest clearance disrupted plant distributions there were significant floristic links between the northern offshore islands and the Northland Peninsula. We suggest that the far northern, disjunct populations of *M. aquilonia* are a further example of this biogeographic pattern.

The Unahi collection is significant, because at this site *M. divaricata* sens. str. and *M. aquilonia* were once sympatric. From herbarium specimens it is clear that *M. divaricata* sens. str. was once present in the formerly extensive kahikatea (*Dacrydium dacrydioides*) dominated forests of the Awanui River, which drains into the Rangaunu Harbour at Unahi (e.g., *R. H. Matthews*, AK 106063/64). There are also two collections of typical “small leaf, weeping” *M. divaricata* sens. str. gathered from Unahi (*H. Carse*, AK 106059) and “Rangaunu Harbour” (*H. Carse*, AK 7084). Surveys of surviving kahikatea forest remnants conducted between 1990 and 1992 by PdL suggest that *M. divaricata* is now extinct



Fig. 5 Main branch of *M. aquilonia* with distinctive ring-like constrictions.

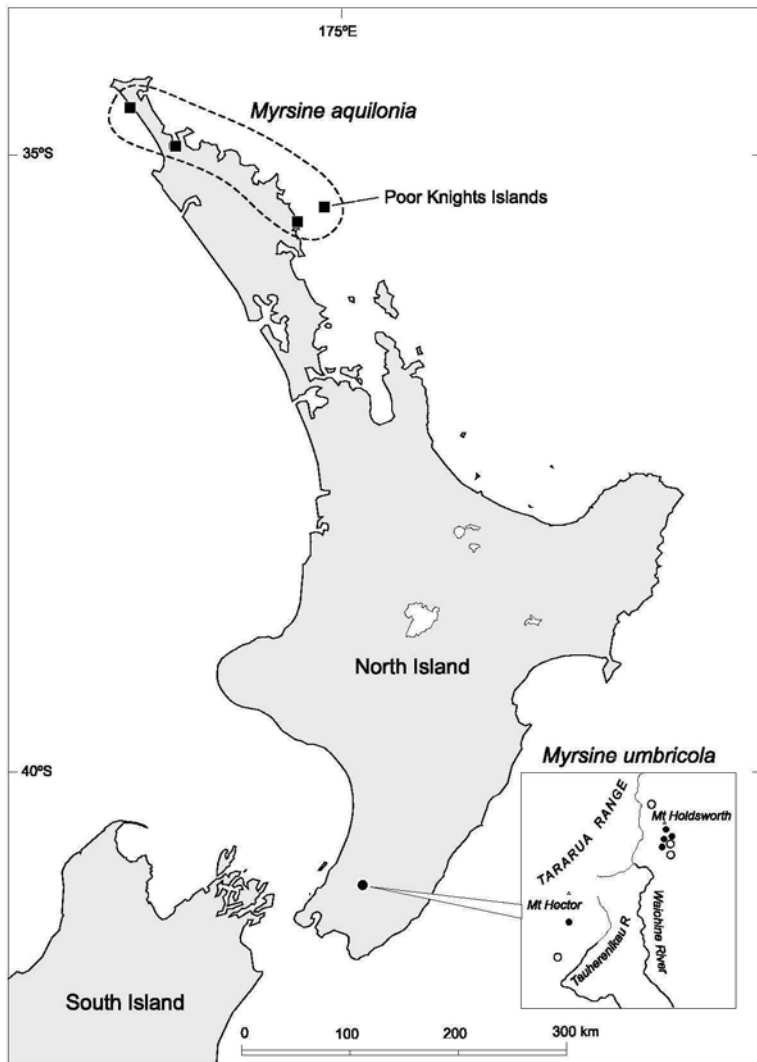


Fig. 6 Distributions of *M. aquilonia* and *M. umbricola*. Solid symbols represent herbarium vouchers; open symbols, field observations.

within the Kaitia-Awanui Lowlands, while additional surveys during 1996 found only one shrub of *M. aquilonia* persisting at Unahi.

HABITATS: Within its main centre of distribution, the rhyolitic Poor Knights Islands, *M. aquilonia* is a conspicuous and at times dominant shrub or small tree of exposed coastal forest, petrel scrub (defined by de Lange & Murray (1998)), cliff scarps, and the associated boulderfields and talus slopes of all the main vegetated islands, islets, and rock stacks of the archipelago (de Lange & Cameron 1999). Within the taller forests of the more sheltered Puweto Valley, Aorangi Island, and under the dense pohutukawa

(*Metrosideros excelsa*) canopy of Tawhiti Rahi, *M. aquilonia* is usually the dominant subcanopy species, becoming emergent only in sites of former wind throw and/or canopy collapse, where it usually grows with another near-endemic species, *Hoheria equitum*.

Outside these islands *M. aquilonia* mainly occupies highly modified, fragmented indigenous habitats, so the associations in which it grows may not be typical. For example, at Unahi it grows in a tidal, estuarine habitat on a shell bank amongst mangroves (*Avicennia marina* subsp. *australasica*), coastal immortality grass (*Austrostipa stipoides*), and glasswort

(*Sarcocornia quinqueflora*). At Te Arai it is found in association with pohutukawa, *Coprosma* spp., and *Kunzea ericoides* var. *linearis*.

ETYMOLOGY: The specific epithet *aquilonia* refers to the “northern” New Zealand distribution of the species.

HYBRIDS: *Myrsine australis* (A. Rich.) Allan × *M. aquilonia*: Aorangi Island, Oneho Hill, *A. E. Wright* 6499, 28 Aug 1984, AK 169485; Aorangi Island, Oneho Hill, *E. K. Cameron* 8493 & *P. J. de Lange*, 7 Aug 1996, AK 228801; Tawhiti Rahi, *A. E. Wright* 11376, 21 Apr 1991, AK 201624.

Myrsine aquilonia × *M. salicina* Heward ex Hook. f.: Tawhiti Rahi, *A. E. Wright* 4035, 11 Sep 1980, AK 218588/CHR 421764; Tawhiti Rahi, *A. E. Wright* 11455, 25 Apr 1991, CHR 451283; Poor Knights Islands, *G. Kuschel*, Dec 1980, CHR 371201.

The putative hybrid involving *M. australis* is anticipated as both parental species are commonly sympatric and flower at the same time. The putative hybrid involving *M. salicina*, possibly known from only a single individual, is similar to specimens of putative hybrids involving *M. divaricata* and *M. salicina* that we have seen from elsewhere in the country (AK!, CHR!). However, at present *Myrsine salicina* is not known from the Poor Knights Islands (de Lange & Cameron 1999), though it is possible that it has been overlooked on the generally less well explored and inaccessible topography of Tawhiti Rahi.

We have also collected from the Auckland University grounds spontaneous putative hybrid plants (CHR 567274) that are derived from a cultivated female plant of *M. divaricata* (ex Woodhill Forest; CHR 567273) and a cultivated male plant of *M. aquilonia* (e.g., CHR 567272) growing about 15 m apart.

CONSERVATION STATUS: *Myrsine aquilonia* (as *M. aff. divaricata*, AK 228797) has been assessed by the New Zealand Department of Conservation Threatened Plant Panel as Taxonomically Indeterminate/Sparse (de Lange et al. 2004). With the formal recognition of *M. aquilonia* we propose the status be Sparse, noting that while the species is abundant and under no threat on the Poor Knights Islands, it is otherwise close to extinction in the two far north locations of Te Arai and Unahi.

***Myrsine umbricola* Heenan et de Lange, sp. nov.**

DIAGNOSIS: A *M. coxio* habitu fruticoso usque ad 4 m elato et 5 m diametro, facie foliosa, ramibus effusis, absentia rhizomatorum foliisque nitidis; a

M. aquilonia habitatione restricta sylvarum perumbrosarum montanarum, statura parvior, truncis gracilibus, foliis leviter angustioribus et vix siscicuratis perviridis quoque macula angusta ad basim differt.

HOLOTYPE: New Zealand, North Island, Tararua Range, Mt Holdsworth, below Powell Hut in silver beech forest, *P. B. Heenan* & *T. Silbery*, 20 Aug 2003, CHR 567280. Isotypi: AK, MEL, MO, K.

DESCRIPTION (Fig. 1–4, 7): Evergreen, spreading, dioecious shrub, up to 4 m tall. Shrubs with 1–5 main trunks, trunks up to 80 mm diam.; outer bark grey, smooth to slightly rough; inner bark, when exposed, pink to grey-pink. Branchlets aggregated toward branch ends, sparse to crowded, virgate, spreading to upright, not divaricating or drooping, slender, branching angle 30–70°, sparsely to moderately lenticellate, leaves moderately to densely covered with simple and branched hairs when young, becoming glabrous with age.

Seedling stem sparsely to moderately covered with simple and branched hairs, sparsely lenticellate; primary branchlets ± patent to main stem; leaves 9–20 × 5–12 mm, obovate, apex retuse with a prominent cleft or toothed to sometimes praemorse, margin and lamina with conspicuous orange glands, base attenuate.

Leaves 11–22 × 7–11 mm, dark green, usually glossy, obovate or oblong-obovate, subcoriaceous, lamina base often with a narrow dark band, alternate on branchlets or brachyblasts; orange glands inconspicuous on lamina and margin of immature leaves, conspicuous on margin of abaxial surface when mature or dry; apex slightly retuse to sometimes ± entire, cleft up to 1 mm deep; margin entire; base attenuate to shortly attenuate; petiole 1.7–3.0 mm long, plano-convex; simple and sometimes branched hairs on petiole, leaf margin, base of midrib, apex, and proximal end of lamina, becoming glabrous or glabrate with maturity.

Flowers axillary or in fascicles. Female flowers solitary or in fascicles of 2(–3), usually sparse; peduncles 2.0–2.4 mm long; subtended by a bract, 0.6–0.7 × 0.6–0.7 mm, green, triangular, apex subacute, margin fimbriate; sepals 4, usually free but sometimes slightly fused at the base, 0.8–0.9 × 0.7–0.8 mm, green, triangular, abaxial and adaxial surfaces glabrous, apex subacute, margins fimbriate; petals 4, free, 1.3–1.6 × 1.0–1.1 mm, broadly elliptic, light green or cream and flushed maroon around margin, upright, abaxial and adaxial surfaces glabrous and with a few orange glands, claw indistinct or <0.2 mm long, apex obtuse, margin fimbriate; ovary 1.3–1.4 × 1.0–1.1 mm, usually with



Fig. 7 *M. umbricola* (foreground) growing as an understory shrub on Mt Holdsworth. Plant approximately 2.3 m high.

conspicuous glands; style distinct, c. 0.2 mm long; stigma 0.6–0.8 × 0.6–0.8 mm, spherical, globular, protruding from closed petals; anthers sessile, rudimentary, 0.6–0.7 × 0.4–0.5 mm, pollen absent. Male flowers solitary or in fascicles of up to 4, usually dense; peduncles 1.4–2.3 × 0.6–0.7 mm; subtended by a bract, 0.6–0.7 × 0.6–0.7 mm, green, triangular, apex subacute, margin fimbriate; sepals 4(–5), usually free but sometimes slightly fused at the base, 0.9–1.1 × 0.7–0.8 mm, green, triangular, abaxial and adaxial surfaces glabrous, apex obtuse,

margins sparsely fimbriate; petals 4(–5), free, 1.9–2.5 × 1.4–1.6 mm, obovate, green and often flushed maroon around margin, spreading from base and recurved at anthesis, abaxial and adaxial surfaces glabrous and with scattered orange glands, claw 0.2–0.6 mm long, apex subacute to obtuse, margins fimbriate; filaments <0.2 mm long, sometimes sessile, attached to lower half of petal; anthers 1.1–1.4 × 0.6–1.0 mm, cream, apices usually with a small tuft of hairs, sometimes glabrous; gynoecium rudimentary, 0.2–0.3 × 0.2–0.3 mm.

Fruit a drupe. Mesocarp green when immature, style base persistent; at maturity 3.4–5.3 × 3.4–5.2 mm, circular or sometimes broadly elliptic, purple or violet. Endocarp 2.6–3.3 × 2.3–2.6 mm, usually circular, terete, light yellow-green to cream-brown with paler ± indistinct longitudinal veins. FL Aug–Sep; FT Oct–Aug.

Chromosome number $2n = 46$ (AK 284492).

REPRESENTATIVE SPECIMENS: NEW ZEALAND: WELLINGTON: Mt Holdsworth, *D. P[etrie]*, 25 Feb 1908, CHR 118505; Mt Holdsworth, *R. Mason*, 24 Dec 1939, CHR 23389; Mt Holdsworth, *A. L. Poole*, 2 Feb 1948, CHR 62340; Mt Holdsworth, *W. R. B. Oliver*, 18 Jan 1949, WELT 14489; Mt Holdsworth, *R. Melville & A. P. Druce*, 7 Dec 1961, CHR 133020; E. Hutt Valley, Tararua Ra., *A. P. Druce*, Sep 1964, CHR 159772; Mt Holdsworth, near Powell Hut, *P. J. de Lange 5616*, 1 May 2003, AK 281575; Mt Holdsworth, *P. B. Heenan & P. J. de Lange*, 1 May 2003, CHR 567269; Mt Holdsworth, halfway between Mountain and Powell huts, *P. J. de Lange 5607*, *P. B. Heenan*, *J. W. D. Sawyer & T. Silbery*, 1 May 2003, AK 281574; Mt Holdsworth, *P. B. Heenan*, *P. J. de Lange & T. Silbery*, 24 Jul 2003, CHR 567224; Mt Holdsworth, *P. B. Heenan & T. Silbery*, 20 Aug 2003, CHR 567278; Mt Holdsworth, *P. B. Heenan & T. Silbery*, 20 Aug 2003, CHR 567275.

DISTRIBUTION (Fig. 6): *Myrsine umbricola* is known only from the Tararua Range, Wellington. The largest known population occurs on Mt Holdsworth and another herbarium collection is from the Eastern Hutt River valley. It has also been observed in silver beech forest at Angle Knob Creek, to the north of Mt Holdsworth (*T. Silbery* pers. comm.).

HABITATS: *Myrsine umbricola* appears to be confined to the upper limits (800–1200 m) of silver beech (*Nothofagus menziesii*) forest within the south-eastern portion of the Tararua Ranges. In this forest type it is usually found on south-facing steep slopes, associated terracettes, and slip scars, where it grows on thin skeletal soils, associated colluvium, and in deep leaf-litter-infilled cracks within exposures of greywacke rock. *M. umbricola* occurs in shaded sites under the silver beech canopy and appears to prefer habitats created by tree fall, snow damage, recent slips, and/or slope failure. *M. umbricola* is generally found in small stands (up to c. 30 plants) of similar-sized adult plants, suggesting that groups of plants comprise even-aged cohorts and that regeneration might be linked to past disturbance events.

Associated species on Mt Holdsworth normally include *M. divaricata* sens. str. (especially toward the

upper limit of the silver beech forest) and the shrubs *Coprosma pseudocuneata*, *C. ciliata*, *C. parviflora* var. *dumosa* (sensu Cheeseman 1925, non Allan 1961), *C. foetidissima*, *Raukaua simplex*, *Nothofagus menziesii*, and scattered plants of *Olearia lacunosa*. With the exception of *Coprosma ciliata*, these are all species characteristic of the understorey vegetation of Tararua Range silver beech forest that is induced by red deer (*Cervus elaphus*). Sporadic specimens of the deer-favoured palatable species *Griselinia littoralis*, *Fuchsia excorticata*, and *Pseudopanax colensoi* occur within the *M. umbricola* habitats, suggesting that in pre-deer conditions these species were perhaps common understorey associates of *M. umbricola*.

Some aspects of the habitat of *M. umbricola* are worthy of further study. Wardle (1962) noted that silver beech forest reaches its maximum altitude near Mt Holdsworth, and that this higher tree line may be because the eastern side of the range experiences fog less frequently and has a consequently longer growing season. It is interesting that *M. umbricola* should be apparently confined to the higher altitude, easterly pockets of silver beech forest within the Tararua Ranges, as these habitats also constitute the southern limit of the North Island cloud forest endemic fern *Microsorium novae-zelandiae*. This fern appears to be frost-intolerant (*P. J. de Lange* unpubl. data) and reaches its greatest abundance in wet, relatively sheltered, cloud forest habitats.

ETYMOLOGY: The specific epithet *umbricola* “shade dwelling” refers to the shaded habitat occupied by the species under the canopy of silver beech forest.

HYBRIDS: *M. divaricata* × *M. umbricola*: Mt Holdsworth, *P. B. Heenan & P. J. de Lange*, 1 May 2003, CHR 567261; Mt Holdsworth, *P. B. Heenan*, *P. J. de Lange & T. Silbery*, 24 Jul 2003, CHR 567229/567230.

Myrsine umbricola is sympatric with *M. divaricata* on Mt Holdsworth and we observed field evidence of putative hybrids between the two species. Hybrid plants tend to have the *M. divaricata* features of a more upright and slightly weeping growth habit, and slightly recurved or divaricate branchlets that often lack leaves toward the tips. The leaves of hybrid plants are usually intermediate between the two putative parents in size and shape, being like *M. divaricata* in having a similar length to width ratio and sometimes with a dark blotch at the base, but like *M. umbricola* in being larger and often slightly glossier and/or darker green than *M. divaricata*.

CONSERVATION STATUS: As a background to the assessment presented here it is notable that Zotov et al. (1939) and Zotov (1949) described forest deterioration in the Tararua Range through severe browse damage by possums (*Trichosurus vulpecula*) and red deer. In particular, Zotov (1949) noted the decline of shrubby vegetation in silver beech forest, including *Suttonia (Myrsine) divaricata*. During our study we found that *M. umbricola* seedlings and juveniles are severely browsed by deer, and that while seedlings and juveniles are in places abundant, the majority are less than 30 cm tall, and none were taller than 80 cm. Furthermore, many of the seedlings and juveniles we examined were probably quite old, and most of their young growths were reversion shoots resulting from suckering and/or epicormic growth produced as a result of the browsing by deer of the stems to ground level.

The populations of *M. umbricola* that we studied have a structure strongly skewed toward adult specimens that are 2–4 m tall. These usually occur in small stands, several of which were almost, if not already, moribund. Thus, while male, female, and fruiting plants were observed, and seedlings and juveniles are present, it would seem that *M. umbricola* is experiencing severe recruitment failure as no plants were observed between 80 cm and 2 m tall. While Zotov's observations on *Suttonia (Myrsine) divaricata* do not distinguish between the species named here and *M. divaricata* sens. str., his observations do indicate that both species have probably been subjected to deer-induced decline for a rather long time.

In terms of population size, our field work on Mt Holdsworth, while restricted to a small geographic area, found fewer than 500 mature individuals of *M. umbricola*. Although further populations may occur elsewhere, it is notable that aside from the additional sites in the Eastern Hutt River valley (*A. P. Druce*, CHR 159772) and near Angle Knob Creek (*T. Silbery* pers. comm.), the species is otherwise absent from herbarium collections made from the Tararua Range. This we consider to be significant, as *M. umbricola* has not been collected elsewhere during extensive field surveys of the Tararua Range by a number of competent field botanists, including D. Petrie, B. C. Aston, W. R. B. Oliver, N. Elder, V. D. Zotov, P. Wardle, and A. P. Druce. It is therefore our opinion that *M. umbricola* has probably been a rather local and uncommon species for at least the last century.

Based on the above information we suggest that *M. umbricola* should be rated Acutely Threatened/

Nationally Endangered using the New Zealand Threat Classification System (Molloy et al. 2002). This assessment is based on current knowledge, which indicates that there are ≤ 500 mature individuals in the wild, these occur in ≤ 5 sub-populations, and with ≤ 300 in the largest sub-population (see Molloy et al. 2002, p. 19). While an exact estimate of the area is unavailable, field inspections suggest the total area of occupancy is ≤ 5 ha, and again, while exact trend data are unavailable, a conservative estimate of population structure and recruitment failure suggests that a decline of $\geq 30\%$ in the total population over the last 100 years is not unreasonable. Indeed, we have observed two large dying or moribund stands of about 20 and 30 adults, respectively, which is c. 10% of the estimated adult population. This suggests to us that if this decline is left unchecked, the Mt Holdsworth populations will be seriously compromised within the next few decades.

To this threat assessment we recommend appending the qualifiers Data Poor and Recruitment Failure because more thorough field surveys are needed to confirm the distribution and number of plants and, of those populations seen, none could be termed viable due to severe deer browse and the apparent lack of recruitment. The Mt Holdsworth population is also very likely to be Conservation Dependent as the control of red deer will almost certainly be required if viable populations with natural levels of recruitment are to be established. We have also found *M. umbricola* difficult to cultivate, as seedlings transplanted from the wild do not appear to shift easily and require relatively high humidity to keep them alive.

CHROMOSOME NUMBERS

Samples prepared for the chromosome counts follow the methods of de Lange & Murray (2002). The count of $2n = 46$ obtained for *M. aquilonia* is the same as that reported by Murray & de Lange (1999). The same number was also obtained for the previously uncounted *M. umbricola* (Fig. 8). As far as could be ascertained, the chromosomes of both *M. aquilonia* and *M. umbricola* are of similar size (2–4 μm) and shape and thus not suitable for karyotype differentiation. Meiotic chromosome counts of $n = 23_{II}$ were observed in both species. Pairing was normal for both species. Chromosome numbers are now known for all the New Zealand representatives of the genus, the others of which also have $2n = 46$.

RECOGNITION AND RELATIONSHIPS

Myrsine aquilonia and *M. umbricola* are more similar to the Chatham Island endemic *M. coxii* than any other member of the small-leaved *M. divaricata* group. The most obvious similarity is that these three species have leaves that are obovate, the apices are retuse, and the bases are attenuate (Fig. 1, 3). However, they may be distinguished from each other by a number of features. *M. aquilonia* has light green or green leaves, obvious orange marginal glands, a prominent deeply retuse apex, and the leaves are usually broader than those of *M. coxii* and *M. umbricola* (Fig. 1, 3). *M. umbricola* has dark green and usually glossy leaves with obvious orange marginal glands, a slightly retuse apex, and the leaves are narrower than those of *M. aquilonia*. The leaves of *M. coxii* are more-or-less matt or only slightly shiny, with sparse orange marginal glands, a slightly retuse apex, and they are relatively narrow in comparison to *M. aquilonia*. The leaves of *M. aquilonia* and *M. coxii* are usually uniformly green, whereas those of *M. umbricola* sometimes have a dark and narrow mark parallel to the base of the midrib; this is not a prominent blotch as in *M. divaricata* and *M. argentea*.

Growth habit of the three species also differs significantly. *M. aquilonia* is a large bushy and leafy shrub or small tree up to 12 m tall, with a large diameter trunk (up to 45 cm at base), spreading branches and branchlets diverging at 30–80°, and it does not produce rhizomatous underground shoots, although it does produce suckers from exposed roots near the base of the trunk. The trunks and branches of *M. aquilonia* also have prominent lateral ring-like constrictions (Fig. 5) that do not occur in *M. coxii* and *M. umbricola*. Plants of *M. aquilonia* in exposed positions and on thinner soils generally grow as bushy multi-branched shrubs, whereas plants in sheltered positions or growing on deeper soils generally form trees with distinct trunks.

Myrsine umbricola is a bushy shrub up to 4 m high and with a spread of up to 4–5 m, and mature adult plants are generally broader than high. The main trunks are slender and usually only 4–6 cm in diameter at the base. Young plants have predominantly upright growth, and at about 2 m high adult plants begin to develop horizontal branches and a spreading, rounded crown. Plants on steep slopes or rocky bluffs usually have main trunks that are perpendicular to the slope.

Plants of *M. coxii* growing in the open on peat bogs form an upright, distinctly columnar, strongly rhizomatous shrub up to 2 m tall, with a slender

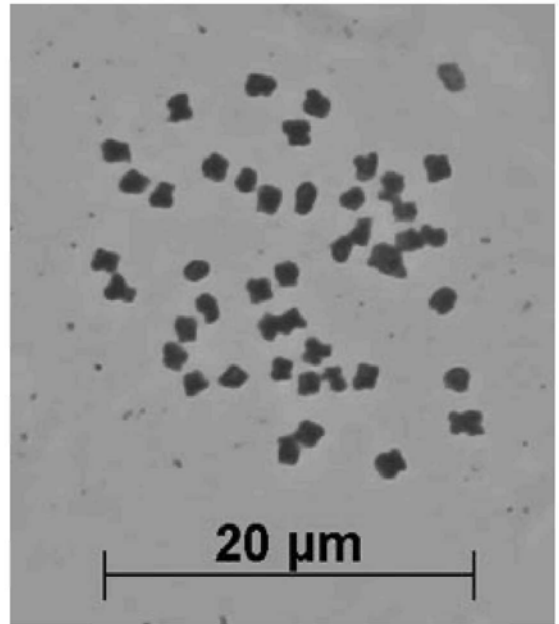


Fig. 8 Somatic chromosomes of *Myrsine umbricola* ($2n = 46$). Scale bar 20 = μm .

(5 cm in diameter at the base) main trunk. In swamp forest habitats *M. coxii* forms an open, sparsely leafy, sparsely branched, and straggly small tree up to 4(–6) m tall, with a single slender main trunk up to 5 cm in diameter at the base, slender and upright branches, and abundant rhizomatous shoots.

Myrsine divaricata is distinguished from *M. aquilonia*, *M. umbricola*, and *M. coxii* by its rigid divaricate branchlets, branches and branchlets with a distinct weeping habit, by the terminal branchlets usually being leafless, and by the prominent dark blotch at the base of the lamina. *M. argentea* has a similar growth habit to *M. aquilonia* in being a shrub to small tree (up to 9 m) with upright or spreading branches or branchlets, but the branchlets diverge at a slightly narrower angle (25–65°) and, like *M. divaricata*, the leaves are smaller and have a prominent dark blotch at the base of the lamina (Fig. 1, 2). The leaves of *M. chathamica* differ from *M. aquilonia* in being obovate, elliptic, to broad-elliptic, larger (20–75 \times 15–40 mm), the leaf apex is usually obtuse although sometimes has a small (<0.6 mm) apical notch (Fig. 1, 3), and the fruit is larger (6–9 mm in diam.).

Young plants of *M. aquilonia*, *M. argentea*, *M. umbricola*, and *M. divaricata* have distinctive growth forms (Fig. 2) and for each species these continue

through to the adult stage. For example, *M. aquilonia* and *M. umbricola* have relatively wide branchlet angles, straight branchlets (that are conspicuously lenticellate in *M. aquilonia*), and the leaves occur along the branchlets and at the branchlet tips; *M. argentea* has a slightly narrower branchlet angle than *M. aquilonia* and *M. umbricola* and also has straight branchlets, with leaves along the branchlets and to their tips; the two plants illustrated of *M. divaricata* are similar in having recurved branchlets, but the Cobb River plant does not have leaves to the branchlet tips whereas the Woodhill Forest plant does. For each of these species, the size and shape of the leaves of the young plants is also similar to that of the adults, and a dark blotch at the base of the lamina is present in both young and adult plants of *M. argentea* and *M. divaricata* (e.g., AK 232758/CHR 490815, CHR 517117). In *M. aquilonia*, the majority of seedlings collected from Aorangi Island (AK 226840/CHR 487614) do not have a dark blotch at the base of the lamina (CHR 487614), although occasionally they do (Fig. 2). Young plants of *M. umbricola* often have a dark narrow band parallel to the midrib at the base of the lamina.

Limited flowering material of *M. coxii* is available for study (e.g., AK 281338, CHR 296893), and there do not appear to be any appreciable differences between the male and female flowers of *M. coxii*, *M. aquilonia*, and *M. umbricola*.

A numerical definition (Divarication Index) for divaricate shrubs was proposed by Kelly (1994), who used leaf width, leaf density, and shoot angle in a simple formula (Table 1). As these three attributes differ in the shrubby species allied to *M. aquilonia* and *M. umbricola*, we examined these species using the Divarication Index to test whether they were divaricate and to evaluate overall differences in their

branchlet and leaf characters. Table 1 summarises the Divarication Index values for the six shrubby species in the *M. divaricata* group. The two samples of *M. divaricata* have the highest scores (18.0 and 22.5) and are comparable to Kelly's (1994) score of 20.8 for the species. Although at the lower end of the range for divaricate plants (19.2; Kelly 1994), we consider these samples are divaricate. *M. argentea*, *M. chathamica*, *M. coxii*, *M. aquilonia*, and *M. umbricola* all have a low divarication index (range 7.6–12.5) and are not considered to be divaricating shrubs. The divarication indices of these four species are similar to the non-divaricate *M. australis* (11.9; Kelly 1994). Overall, leaf and branchlet characters reliably separate *M. divaricata* from the other five non-divaricate small-leaved species.

BIOGEOGRAPHY AND ECOLOGY

The seven small-leaved species of *Myrsine* in New Zealand exhibit interesting biogeographic and ecological patterns. *M. aquilonia*, *M. argentea*, *M. coxii*, *M. chathamica*, and *M. umbricola* have restricted distributions, appear to have specific habitat preferences, and have distinct growth habits although these vary in response to local variations in habitat.

Myrsine aquilonia is primarily a warm climate insular species that exhibits remarkable plasticity in growth habit dependent on whether it occurs in exposed (shrub form) or sheltered (tree form) sites. In common with other Poor Knights Islands near endemics (e.g., *Hoheria equitum*) it is a quick-growing species that produces new branches from exposed roots near the main trunk and these give plants a dense and bushy growth habit in exposed sites. This growth habit is considered to be a specialisation to

Table 1 Divarication Index*. ANGL, shoot angle (5 reps); LWT, leaf width (5 reps); NLT, number of leaves per 10 cm of stem (1 rep); FILIW, internode/leaf width ratio: (100/NLT)/LWT.

Species	Source	ANGL	LWT	NLT	FILIW	Divarication Index
<i>M. aquilonia</i>	Aorangi Island, Poor Knights Islands	54	11.8	10	0.84	12.5
<i>M. argentea</i>	Mt Burnett, Nelson	47	7.2	12	1.15	11.9
<i>M. chathamica</i>	Chatham Islands	31	11.6	16	0.53	7.6
<i>M. coxii</i>	Chatham Islands	43	10.8	41	0.19	9.7
<i>M. divaricata</i>	Cobb River, Nelson	112	0	0	0	22.5
<i>M. divaricata</i>	Woodhill Forest, Auckland	73	9.0	7	1.58	18.0
<i>M. umbricola</i>	Mt Holdsworth, Wellington	37	9.9	18	0.56	9.7

* Divarication index = $FILIW + (10/LWT) + ANGL/5$ (Kelly 1994).

the highly dynamic coastal habitat favoured by the species, which is prone to wind, salt-burn, dessication, sudden sand movement, and saline inundation.

Myrsine umbricola exhibits little variation in growth habit, being a spreading shrub 2–4 m tall. It has a strong, almost obligate, association with silver beech forest and it occurs in shaded habitats within the canopy on skeletal soils, associated recent colluvium, and among rocky outcrops. Unlike *M. coxii* and *M. aquilonia*, *M. umbricola* does not produce rhizomatous growth or epicormic branches from exposed roots, although it occasionally produces epicormic branches from the main trunks. Mature plants of *M. umbricola* are the analogue of small silver beech trees, as both have a very similar spreading and rounded growth habit and dense green foliage of similar-sized leaves. Indeed, plants of silver beech and *M. umbricola* about 2–4 m tall are virtually indistinguishable at a distance of only a few metres.

The Chatham Island endemic *M. coxii* occurs mainly in the ecotone between the *Sporadanthus traversii*-dominant restiad bogs and *Dracophyllum arboreum*–*Myrsine chathamica*-dominated swamp forest of the southern tablelands. Its rhizomatous stems allow it to creep through the bog to colonise small “clears” within the dense *Sporadanthus* vegetation, and its slender upright habit enables branches to push their way up through the otherwise dense canopies produced by the swamp forest dominants. *M. chathamica* occurs on Chatham Island and Stewart Island, where it grows in swamp forest and dune forest, often as a canopy dominant, and depending on the habitat it can form either a bushy shrub or a spreading tree up to 8 m tall. *M. argentea*, an endemic of dolomite-calcite rock outcrops on Mt Burnett, North-West Nelson, also forms either a bushy upright shrub on open and exposed karrenfield, or an upright small tree in silver beech–southern rata forest.

In contrast, *M. divaricata* and *M. nummularia* occur throughout New Zealand and are generalists in their habitat preferences. *M. divaricata* generally favours high-fertility sites but occurs on a wide range of habitats, including those that are waterlogged, drought prone, and cold. Its distinctive divaricate growth form has been attributed to the effects of either moa browsing (Greenwood & Atkinson 1977) or cold and windy climates (e.g., McGlone & Webb 1981). *M. nummularia* is a prostrate or decumbent shrub that prefers the open habitat of rock outcrops, grassland, and herbfield.

The addition of *M. umbricola* to the flora of the lower North Island adds another species to an area that is considered to have few endemics (e.g., McGlone 1985, fig. 2; Rogers 1989). Other species that are considered to be endemic to the lower North Island include *Hebe truncatula*, *Mazus novaezealandiae* subsp. *novae-zealandiae*, *Olearia gardneri*, and *Selliera rotundifolia*. Within the lower North Island a number of other species are also endemic to the Tararua Range and, in addition to *M. umbricola*, include *Aciphylla dissecta*, *Euphrasia drucei*, *Hebe evenosa*, *Raoulia rubra*, and *Wahlenbergia pygmaea* subsp. *drucei*.

Supporting a close relationship between *M. coxii* and *M. aquilonia* on biogeographic grounds is the occurrence of other closely related species in northern New Zealand and the Chatham Islands. For example, *Sporadanthus traversii*, *Hebe dieffenbachii*, and *H. barkeri* occur on the Chatham Islands but their closest relatives *S. ferrugineus*, *H. bollonsii*, and *H. breviracemosa* are restricted to northern parts of New Zealand (Garnock-Jones 1976; de Lange et al. 1999b).

TYPIFICATION

Myrsine divaricata A.Cunn., *Ann. Nat. Hist.* 2, 47 (1839)

TYPE COLLECTION (*vide* Cunningham 1839): “New Zealand (Northern Island). A shrub found at the head of the Wycaddy river, Bay of Islands; also near the mission station on the Hokianga, —1834, R. Cunningham.”

LECTOTYPE (here chosen): a shrub ... not seen in flower ... found at the head of the Wycaddy [Kerikeri] River & behind the Mission Station at Hokianga. New Zealand, R. Cunningham, 1834, K.

NOTE: There is additional syntype material at BM. A type specimen for *Myrsine divaricata* A.Cunn. has not previously been selected, and Allan (1961, p. 543) did not locate any specimens at either the British Museum of Natural History (BM) or Kew Gardens (K). We have located a specimen at K and here select this as the lectotype. This specimen is well labelled and consistent with the protologue. The description of *M. divaricata* provided by Cunningham (1839) includes reference to fruit but not flowers, and the lectotype specimen is in fruit and lacks flowers.

Myrsine × *montana* (Hook.f.) Hook.f., *Handb. N. Zeal. Fl.*, 184 (1864)

≡ *Suttonia divaricata* var. *montana* Hook.f., *Fl. Nov.-zeland.*, 173 (1853).

TYPE COLLECTION: "Top of Ruahine range, Colenso."

LECTOTYPE (here chosen): 1514, *Suttonia montana*, *W. C.*, n. sp., K.

NOTES: Specimen 1514 was sent by W. Colenso to Sir W. J. Hooker in July 1848 (Colenso's MS list of plants sent to W. J. Hooker; copy held at CHR). This specimen was collected "from hills, N. side of Ruahine". Other specimens of *M. ×montana* numbered 2356 were sent by Colenso to Hooker in June 1850, and Colenso's list of plants sent to W. J. Hooker indicates that these were taken from the same plant as the specimen numbered 1514. The specimens numbered 2356 were probably those referred to by Hooker (1855, p. 334) when he inferred he would recognise *Suttonia divaricata* var. *montana* at species rank.

≡ *Rapanea montana* (Hook.f.) W.R.B.Oliver, *Rec. Auck. Inst. Mus.* 4, 112 (1951).

= *Myrsine neozealandensis* Colenso, *Trans. & Proc. New Zealand Inst.* 22, 479 (1890).

TYPE COLLECTION: "Edge of a wood on open plain south of Dannevirke, County of Waipawa; 1899: *W. C.*"

LECTOTYPE: (here chosen): Dannevirke, H. B., *W. Colenso*, WELT 23710!

≡ *Suttonia neozealandensis* (Colenso) Mez, *Pflanzenr.* 9, 334 (1902).

The hybrid name *M. ×montana* has been attributed to *M. australis* × *M. divaricata* (Cockayne & Allan 1934). However, based on an examination of the type specimen and comparison of hybrid specimens of *Myrsine* in AK and CHR we conclude that the parentage of *M. ×montana* is *M. divaricata* × *M. salicina*. Plants of *M. divaricata* × *M. salicina* typically have coriaceous, flat, oblanceolate leaves, 20–40 mm long and 10–15 mm wide (e.g., CHR 158904, CHR 387036). In contrast, plants of *M. australis* × *M. divaricata* usually have thin, undulate, elliptic to broad-elliptic leaves, 15–30 mm long and 10–13 mm wide (e.g., CHR 417831, CHR 455584).

Myrsine brachyclada Colenso, *Trans. & Proc. New Zealand Inst.* 22, 478–479 (1890)

NOTES: Cheeseman (1906, 1925) treated this name as a synonym of *Aristotelia fruticosa* Hook.f. We have been unable to locate any Colenso specimens that are referable to *M. brachyclada*.

ACKNOWLEDGMENTS

We thank Lisa Forester for collecting permits and Ngati Wai for permission to collect on the Poor Knights Islands, Ewen Cameron, Tony Silbery, and John Sawyer for companionship in the field, and Mike Ogle, Colin Miskelly, and Amanda Baird for facilitating visits by PdL to the Chatham Islands. Hellmut Toelken kindly provided the Latin translations, Kirsty Cullen and Anouk Wanrooy prepared Fig. 1 and 2, Chris Edkins prepared Fig. 6, and David Glenny and Ilse Breitwieser critically reviewed the draft manuscript. We thank Audrey Eagle for permission to use her previously unpublished paintings (Fig. 3).

REFERENCES

- Allan, H. H. 1961: Flora of New Zealand. Vol. I. Wellington, Government Printer.
- Aston, B. C. 1910: Botanical notes made on a journey across the Tararuas. *Transactions and Proceedings of the New Zealand Institute* 42: 13–25.
- Cheeseman, T. F. 1906: Manual of the New Zealand flora. Wellington, Government Printer.
- Cheeseman, T. F. 1925: Manual of the New Zealand flora. 2nd ed. Wellington, Government Printer.
- Cockayne, L. 1912: Observations concerning evolution, derived from ecological studies in New Zealand. *Transactions and Proceedings of the New Zealand Institute* 44: 1–50.
- Cockayne, L.; Allan, H. H. 1934: An annotated list of groups of wild hybrids in the New Zealand flora. *Annals of Botany* 48: 1–55.
- Cranwell, L. M. 1962: Endemism and isolation in the Three Kings Islands, New Zealand – with notes on pollen and spore types of the endemics. *Records of the Auckland Institute and Museum* 5: 215–232.
- Cunningham, A. 1839: VII.—Florae Insularum Novae Zelandiae Precursor; or a specimen of the Botany of the Bay of Islands of New Zealand. *Annals of Natural History* 2: 44–52.

- de Lange, P. J.; Cameron, E. K. 1999: The vascular flora of Aorangi Island, Poor Knights Islands, northern New Zealand. *New Zealand Journal of Botany* 37: 433–468.
- de Lange, P. J.; Murray, B. G. 1998: *Senecio repangae* (Asteraceae) – a new endemic *Senecio* species from north-eastern North Island, New Zealand. *New Zealand Journal of Botany* 36: 509–519.
- de Lange, P. J.; Murray, B. G. 2002: Contributions to a chromosome atlas of the New Zealand flora—37. Miscellaneous families. *New Zealand Journal of Botany* 40: 1–23.
- de Lange, P. J.; Cameron, E. K.; Murray, B. G. 1999a: *Alectryon excelsus* subsp. *grandis* (Sapindaceae): a new combination for an uncommon, small tree, endemic to the Three Kings Islands, New Zealand. *New Zealand Journal of Botany* 37: 7–16.
- de Lange, P. J.; Heenan, P. B.; Clarkson, B. D.; Clarkson, B. R. 1999b: Taxonomy, ecology, and conservation of *Sporadanthus* F.Muell. (Restionaceae) in New Zealand. *New Zealand Journal of Botany* 37: 413–431.
- de Lange, P. J.; Norton, D. A.; Heenan, P. B.; Courtney, S. P.; Molloy, B. P. J.; Ogle, C. C.; Rance, B. D.; Johnson, P. N.; Hitchmough, R. 2004: Threatened and uncommon plants of New Zealand. *New Zealand Journal of Botany* 42: 45–76.
- Eagle, A. 1982: Eagle's trees and shrubs of New Zealand. Second series. Auckland, Collins.
- Gardner, R. O. 1997: *Macropiper* (Piperaceae) in the south-west Pacific. *New Zealand Journal of Botany* 35: 293–308.
- Garnock-Jones, P. J. 1976: *Hebe rapensis* (F. Brown) Garnock-Jones comb. nov. and its relationships. *New Zealand Journal of Botany* 14: 79–83.
- Greenwood, R. M.; Atkinson, I. A. E. 1977: Evolution of divaricating plants in New Zealand in relation to moa browsing. *Proceedings of the New Zealand Ecological Society* 24: 21–33.
- Heenan, P. B.; de Lange, P. J. 1998: A new and remarkably local species of *Myrsine* (Myrsinaceae) from New Zealand. *New Zealand Journal of Botany* 36: 381–387.
- Hooker, J. D. 1855: The Botany of the Antarctic Voyage II. Flora Novae-zelandiae. London, Lovell Reeve.
- Kelly, D. 1994: Towards a numerical definition for divaricate (interlaced small-leaved) shrubs. *New Zealand Journal of Botany* 32: 509–518.
- McGlone, M. S. 1985: Plant biogeography and the late Cenozoic history of New Zealand. *New Zealand Journal of Botany* 23: 723–749.
- McGlone, M. S.; Webb, C. J. 1981: Selective forces influencing the evolution of divaricating plants. *New Zealand Journal of Ecology* 4: 20–28.
- Molloy, J.; Bell, B.; Clout, M.; de Lange, P.; Gibbs, G.; Given, D.; Norton, D.; Smith, N.; Stephens, T. 2002: Classifying species according to threat of extinction – a system for New Zealand. Wellington, Department of Conservation.
- Murray, B. G.; de Lange, P. J. 1999: Contributions to a chromosome atlas of the New Zealand flora — 35. Miscellaneous families. *New Zealand Journal of Botany* 37: 511–521.
- Petrie, D. 1908: Account of a visit to Mount Hector, a high peak of the Tararuas, with a list of flowering-plants. *Transactions and Proceedings of the New Zealand Institute* 40: 289–304.
- Rogers, G. M. 1989: The nature of the lower North Island floristic gap. *New Zealand Journal of Botany* 27: 221–241.
- von Konrat, M. J.; Braggins, J. E.; de Lange, P. J. 1999: *Davallia* (Pteridophyta) in New Zealand, including description of a new subspecies of *D. tasmanii*. *New Zealand Journal of Botany* 37: 579–593.
- Wardle, P. 1962: Subalpine forest and scrub in the Tararua Range. *Transactions of the Royal Society of New Zealand, Botany* 1: 77–89.
- Webb, C. J.; Simpson, M. J. A. 2001: Seeds of New Zealand gymnosperms and dicotyledons. Christchurch, Manuka Press.
- Zotov, V. D. 1949: Forest deterioration in the Tararuas due to deer and opossum. In: Report of the Sixth Science Congress. *Transactions of the Royal Society of New Zealand* 77: 162–165.
- Zotov, V. D.; Elder, N. L.; Beddie, A. D.; Sainsbury, G. O. K.; Hodgson, E. A. 1939: An outline of the vegetation and flora of the Tararua Mountains. *Transactions and Proceedings of the Royal Society of New Zealand* 68: 259–324.