

Auckland Botanic Gardens *Arthropodium* trial, 2012–2017

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Introduction

Arthropodium is a genus of about 10 species native to Madagascar, New Caledonia, Australia and New Zealand. *Arthropodium* was traditionally placed in the lily family (Liliaceae), but current treatments include it in the Asparagaceae.

Arthropodium bifurcatum and *A. cirratum* (rengarenga or New Zealand rock lily) are New Zealand native herbaceous perennial plants commonly used in amenity horticulture and home gardens². They thrive in shady places and perform well in dry soils such as under trees, and are often used in mass plantings. They provide effective groundcover, being evergreen and requiring minimal maintenance. Sprays of white flowers are produced on spikes in late spring and summer.



Fig. 1 Bacterial leaf spot on *Arthropodium* foliage. Photo: Jack Hobbs.

In the last few years bacterial leaf spot (Fig. 1) has become more obvious on rengarenga in Auckland. It develops a red colouration on the foliage, a defence to protect the leaves after a

light infection (in this case bacterial leaf spot) where flavonoids, the important group of plant pigments found in petals and foliage, such as anthocyanin, are produced by the plant to minimise UV damage. This red colouration also develops after frosts.

Methods

This report details the results of a native *Arthropodium* trial undertaken at Auckland Botanic Gardens (ABG) to identify the top performing cultivars for Auckland conditions. Evaluations focused on assessment of overall ornamental merit, severity of bacterial leaf spot and snail/slug damage.

The trial was planted in May 2012 in a shady bed under *Callistemon* in the ABG trial garden. Three plants each were planted of most selections; however some had just one or two plants. An annual application of blood and bone fertiliser was applied in autumn and mulch applied as required. Deadheading occurred after flowering and before seed set; spent leaves were removed at the same time as deadheading in mid-January. Slug and snail bait was applied during spring and summer from 2012 to 2015. In the final year of this trial no slug and snail bait was applied. NPK fertiliser was applied in May 2015.

Data collection commenced in July 2014 with weekly flowering records and quarterly assessments of pests and diseases. Pests and diseases assessed included mollusc (snail and slug) damage and bacterial leaf spot. An estimate of the percentage of the plant affected was recorded and averaged at the end of the trial. Flower display, flower colour and foliage colour was recorded once during a flowering period. Height and width of each plant was measured and averaged. Height of the plant was measured from the base of the plant to the highest part of the foliage. Width

of the plant was measured across the widest part of the plant. Each selection was given an overall rating based on habit, size, and flowering period, along with pest and disease observations at ABG by an internal evaluation panel. The overall rating (between 1 = poor performer and 10 = excellent performer) was used to determine the list of top performers. Cultivars that scored 8 or more are considered top performers and are recommended for growing in Auckland based on the results of this trial (summarised in Table 1).

The trial ran for five years and was concluded after flowering in January 2017.

Results

In Table 1 we have noted accession numbers (unique eight digit numbers linked to the ABG plant database) next to some unnamed selections of *A. cirratum* so that we can differentiate them from each other. Collection information including the supplier of the specific plant used in the trial can be identified for those interested. All star performers are cultivars commercially available.



Fig. 2 *Arthropodium* 'Parnell'. Photo: Jack Hobbs.

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² A third native species, *Arthropodium candidum* (the small renga lily) is a diminutive plant that is cultivated but not used for mass plantings in the same way as the much larger other two species. Because it is not comparable, *A. candidum* was excluded from the ABG trial.

Table 1 Summary results of the 20 *Arthropodium* selections comprising habit, size, flowering period, significant pest and disease responses and overall plant performance rating. An upright inflorescence is when the flower spike is vertical and flowers are held above the foliage.

Name	Habit and size (height by width in cm)	Flowering	Pests and Disease	Overall rating
<i>A. cirratum</i> 20120456	Sparse foliage. 45 × 32	Early to mid-Dec.	Bacterial leaf spot.	4
<i>A. cirratum</i> 20120459	55 × 40	Early to mid-Dec. Very few flowers.	Snail damage.	5
<i>A. cirratum</i> 20120457	Wide glaucous foliage. 62 × 32	Late Nov to mid-Dec. Upright inflorescence.	Relatively clean.	7
<i>A. cirratum</i> 20120458	No glaucous colouring on foliage. 63 × 40	Mid-Nov to mid-Dec. Upright inflorescence.	Clean.	7
<i>A. bifurcatum</i> 'Parnell' (Fig. 2)	Wide leaf. Offshore island form. 57 × 31	Late Nov to mid-Dec. Upright inflorescence.	Bacterial leaf spot on older leaves.	8
<i>A. cirratum</i> 20120460	Wide leaf. 59 × 67	Late Nov to mid-Dec. Upright inflorescence.	Relatively clean.	7
A. 'Elite'	Wide leaf. 47 × 30	Late Nov to mid-Dec. Masses of flowers and upright inflorescence.	Bacterial leaf spot on older leaves.	7
<i>A. cirratum</i> 20120463	Collapsing/lax habit. 58 × 37	Nov to mid-Dec. Masses of flowers on arching inflorescence.	Had the worst bacterial leaf spot.	5
A. 'Pink Elite'	49 × 34	Mid-Nov to late Nov. Sparse, pink flowers on upright inflorescence.	Had the worst snail damage.	6
<i>A. bifurcatum</i> 'Downtown' (Fig. 3)	Good groundcover. 63 × 37	Late Nov to early Dec. Slight pink flowers, free flowering. Dense, upright inflorescence held just above foliage.	Some bacterial leaf spot.	8
<i>A. cirratum</i> 'Te Puna'	Narrow leaf. Floppy/lax habit. Unattractive plant. 57 × 38	Early Nov to mid-Nov. Sparse flowering.	Clean.	6
A. 'White Spire' (Fig. 4)	Foliage doesn't have glaucous blush. Slightly streaky foliage. 65 × 34	Early Nov to mid-Nov. Flowers not held above the foliage.	Lots of snail damage.	6
<i>A. cirratum</i> 20080250	Glaucous blush and compact habit. Good foliage plant. 47 × 31	Early Nov to mid-Nov. Only two inflorescences per plant.	Relatively clean foliage.	6
<i>A. cirratum</i> 19920891	Offshore island form. Wide foliage. 58 × 36	Early Nov to early Dec. Some flowers on upright inflorescence but few flowers per inflorescence.	Relatively clean foliage.	6
<i>A. cirratum</i> 19920399	Narrow foliage. Unimpressive habit. 47 × 33	Mid-Dec to early Jan. Very small flower size.	Snail damage.	5
A. 'Te Ngaire' (Fig. 5)	Narrow foliage. 54 × 35	Early Nov to mid-Dec. Few flowers.	Snail damage.	6
<i>A. bifurcatum</i> 'White Knight' (Fig. 6)	Wide, dense foliage, slight glaucous blush. Good foliage plant. 62 × 32	Late Oct to early Dec. Upright, lots of flowers on inflorescence.	Relatively clean foliage.	8*
<i>A. bifurcatum</i> 'Matapouri Bay'	Medium width foliage, offshore island form. 71 × 76	Late Oct to early Dec. Upright inflorescence with medium density of flowers.	Clean foliage but some snail damage.	7
<i>A. bifurcatum</i> 'Joy Splash' (Fig. 7)	Variegated streak and floppy foliage. Sparse habit. 62 × 29	Early Nov to early Dec. Sparse flowers.	Clean but some snail damage.	7
A. 'Little Splash'	Small compact offshore island form. Slight glaucous colouring on foliage. 42 × 24	Early to mid-Dec. Few flowers.	Clean foliage.	6

*NB: *Arthropodium bifurcatum* 'White Knight' rated 8 in this trial but has not always performed to this level over the many years it has been grown at ABG.



Fig. 3 *Arthropodium* 'Downtown' (syn. *A. 'Avalanche'*). Photo: Jack Hobbs.



Fig. 4 Foliage of *Arthropodium* 'White Spire'. Photo: Emma Bodley.



Fig. 5 *Arthropodium* 'Te Ngaire'. Photo: Jack Hobbs.



Fig. 6 *Arthropodium* 'White Knight'. Photo: Jack Hobbs.

The largest cultivar was *A. bifurcatum* 'Matapouri Bay' and the smallest was *A. 'Little Splash'*. Selections with the longest flowering period were *A. bifurcatum* 'White Knight' and *A. bifurcatum* 'Matapouri Bay'.



Fig. 7 Close up of *Arthropodium* 'Joy Splash' foliage. Photo: Jack Hobbs.

Arthropodium 'Pink Elite' was most susceptible to mollusc damage and *A. bifurcatum* 'Joy Splash' and *A. 'Little Splash'* were the least susceptible to mollusc damage (Fig. 8).

A potential variable environmental factor in this trial was that not all light levels were equal for all cultivars. This may have affected their susceptibility to pests and diseases, and flower production.

Conclusions

Cultivars of *A. bifurcatum* that performed well at ABG included *A. bifurcatum* 'Matapouri Bay', *A. bifurcatum* 'Parnell' and *A. bifurcatum* 'Downtown'. *A. bifurcatum* 'Downtown' has been marketed erroneously as *A. 'Avalanche'* by Naturally Native nursery. *A. bifurcatum* 'Downtown'

can easily be divided vegetatively and can be multiplied in this manner more rapidly than most *Arthropodium*. We also recommend *A. bifurcatum* 'White Knight', however we would like to emphasise that *A. bifurcatum* 'White Knight' will only do well in specific locations such as dry shade.

In our trials we found that selections of the recently described offshore island species *A. bifurcatum* make the most impressive plants for amenity use. Typically these are taller and more vigorous than most mainland selections with an attractive glaucous hue on the upper surface of their relatively thick and wide arching foliage. In most cases their inflorescences are taller, more upright and overall more impressive than those of many *A. cirratum* selections. However, *A. bifurcatum* is a Northland species that may have less cold tolerance than selections derived from *A. cirratum*.

Arthropodium bifurcatum 'Matapouri Bay' is the most widely commercially available offshore island selection (from the Poor Knights). *A. 'Little Splash'* was the only significantly small *Arthropodium* variety in this trial that is commercially available. It would be suitable for a small home garden or courtyard. We noted that *A. bifurcatum* 'Joy Splash' does not create an effective groundcover compared to other *Arthropodium* selections.

Arthropodium are best planted in dry shade. Sun may enhance the production of anthocyanins which causes red spots on damaged leaves.

Some of the plants that scored less than 8 may perform better in more shade than they received in our trial. Old spent leaves can be removed and flower spikes deadheaded after flowering.

Origins of cultivars

Arthropodium bifurcatum 'Downtown' was collected by Jack Hobbs and Graeme Platt from traffic islands in Quay Street, Auckland in about 1994. Terry Hatch of Joy Plants, Pukekohe, believes that the original plants in Quay Street were plants he supplied Nancy Steen and Auckland City Council that he raised from seed supplied to him by Suzi Bedford (an amateur plant conservationist from St Heliers, Auckland), probably originally collected by Geoff Baylis from the Three Kings Islands in the 1950s.

Arthropodium bifurcatum 'Joy Splash', as the name suggests, was raised by Joy Plants. It arose as a variegated seedling collected near Matapouri Bay more than 10 years ago (Terry and Lindsey Hatch, pers. comm.).

Arthropodium 'Pink Elite' was collected by Jack Hobbs from a planting in Quay Street, Auckland in December 1992. It was selected for its pinkish flowers.

Arthropodium bifurcatum 'Matapouri Bay' was introduced into cultivation probably in the late 1980s by Bay Bloom Nurseries of Tauranga (Bay Bloom Nursery catalogue, Autumn-Winter 1990; Metcalf, 1993) and named by Malcolm Woolmore. It was collected originally from a plant growing on the Poor Knights and then cultivated at a private garden half way between Tutukaka and Matapouri Bay, Northland in 1980s (Guy Bowden and Malcolm Woolmore, pers. comm.). The selection is variable in form as it appears to be generally propagated by seed.

Arthropodium bifurcatum 'White Knight' may be a selection made in the 1980s from plants growing on the same property as *A. bifurcatum* 'Matapouri Bay' and were originally collected from a mainland coastal cliff in Northland opposite the Poor Knights. This plant was named by Malcolm Woolmore (Guy Bowden and Malcolm Woolmore, pers. comm.).

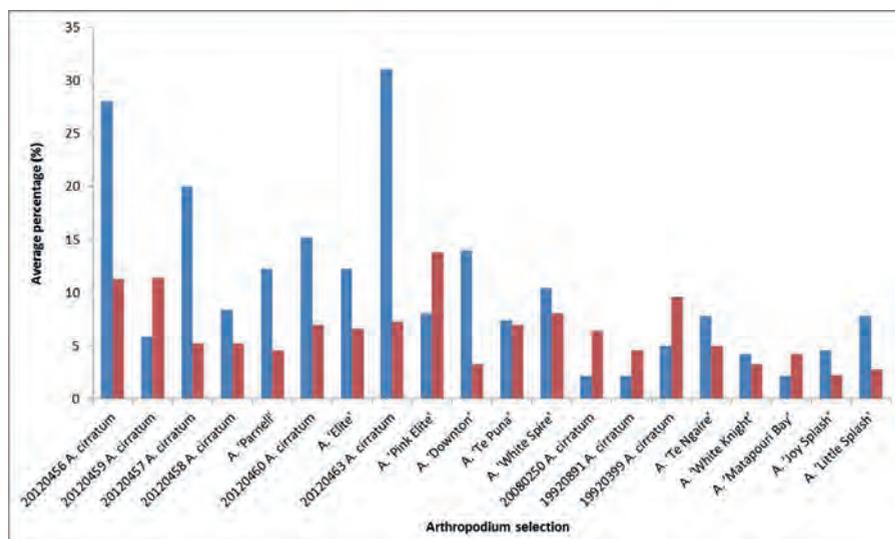


Fig. 8 Average percentage of bacterial leaf spot (blue) and mollusc (snail and slug) damage (red) on each variety of *Arthropodium* from July 2014 to March 2016.

Arthropodium bifurcatum 'Parnell' was originally collected from Parnell Rose Gardens in the late 1980s by Jack Hobbs and Graeme Platt, and grown on at ABG as a parent block in 1991 which supplied the commercial trade with seed.

Arthropodium cirratum 'Te Puna' is a selection made by Mark and Esmé Dean in the 1990s when they were owners of Naturally Native NZ Plants in Tauranga. The original selections were made from plants growing in a clump on the foreshore of Omokoroa. Their selection was named after the nearby area of Te Puna. The plants were selected because they were smaller and particularly attractive and healthy looking (Esmé Dean and Ian Duncalf, pers. comm.).

Arthropodium cirratum 'White Spire' originated in the Otari Native Botanic Garden and Wilton's Bush Reserve (*Commercial Horticulture*, July 1990; Metcalf, 1993). It was selected by the curator of the time (1962 to 1991), the late R.H. Mole, a well-known plantsman.

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