

A Key and notes for *Acaena* (Rosaceae) in New Zealand

By Kelvin Lloyd

To the untrained eye, species of *Acaena* (bidibids) can appear confusingly similar. The most recent key to NZ *Acaena* species was provided by Bryony Macmillan in Volume IV of the Flora of New Zealand series (Webb *et al.*, 1988). Six new indigenous species of *Acaena* have been described since 1980 (Macmillan, 1983; 1985; 1989; 1991) and four of these (*A. emittens*, *A. juvenca*, *A. rorida* and *A. tesca*) were described too late for inclusion in the 1988 key. A new key to the genus appears warranted.

Acaena is a genus of perennial herbs or dwarf shrubs, which are often prostrate and mat-forming. *Acaena* leaves are imparipinnate (*i.e.* two rows of leaflets on either side of the midrib, plus one terminal leaflet) the leaflets are toothed, and stipules persist at the leaf bases. Flowers have a calyx of 3-5 sepals but no petals are present. Flowers and fruits can be arranged along a spike or in a capitulum (compact spherical seed head). The dry fruits are enclosed within a hypanthium which generally bears four spines (frequently barbed), but spines may be absent. Habitats include open places, dunes, grassland, shrubland and forest. *Acaena* species can be found throughout New Zealand, from near sea level to 1850m in altitude. If the subantarctic islands to the south of the New Zealand mainland are included, 18 *Acaena* species (16 indigenous) are present in the New Zealand region, representing four taxonomic sections of the genus.

Hybridisation is relatively common between species of *Acaena* (Dawson, 1960; Webb *et al.* 1988. The widespread *A. novae-zelandiae* is frequently one of the parents. It hybridises both with species from its own section (sect. *Ancistrum*) and with section *Microphyllae* species. *Acaena* hybrids may be conspicuous and vigorous, and can be difficult to key out. For example, hybrids between *A. novae-zelandiae* and *A. microphylla* var. *pauciglochidiata* appear vegetatively similar to the latter, but capitula are supported by longer stalks and bear more fruits, with barbed spines, as in *A. novae-zelandiae*. The parent species can usually be found in the same vicinity as the hybrids

Some *Acaena* species are very widespread, while others are restricted to particular regions or habitats (Table 1). The Otago region, with 14 species, is a centre of diversity for *Acaena* in New Zealand. Look around and you'll be bound to find them, and please test the key out!



Table 1. Distribution and habitats of *Acaena* species in New Zealand region. (information from personal observations, Webb *et al.* 1988; Macmillan 1989; 1991)

Species	Distribution and typical habitat
<i>A. agnipila</i>	Scattered through North Is. and eastern South Is. Dry short grassland, riverbeds and waste places up to 900m alt.
<i>A. anserinifolia</i>	Very widespread in NZ. Margins of forest and shrubland, beside tracks and streams, coastal to low alpine.
<i>A. buchananii</i>	Eastern South Is. from Marlborough to Otago. Lowland to montane short dry grassland and turf, mainly in inland basins.
<i>A. caesiiglauca</i>	South Is., east of main divide. Montane to alpine tussock grassland and scree margins
<i>A. dunicola</i>	Eastern South Is. from Awatere Valley to Eyre Mountains. Shady sites (beneath shrubs, beside rocks) in grasslands.
<i>A. emittens</i>	Central North Is. south of L. Taupo. In shrublands and beech forest from 450-1500m alt.
<i>A. fissistipula</i>	South Is. Montane to alpine grasslands and herbfield, often beside streams and seepages
<i>A. glabra</i>	Eastern South Is. from Marlborough to North Otago. Shingle and scree margins, 600-1750m alt.
<i>A. inermis</i>	Central North Is. Widespread in eastern South Is., occasionally in west. Montane to alpine grasslands and riverbeds.
<i>A. magellanica</i>	Macquarie Is. Gravel, herbfield and fellfield.
<i>A. juvenca</i>	Lower North Is. and eastern South Is. Open forest, forest margins, shrublands and grasslands. Coastal to 1200m alt.
<i>A. microphylla</i>	var. <i>microphylla</i> : Central North Is. Grassland, river terrace, 500-1300m alt. var. <i>pauciglochidiata</i> : Coastal Otago, Southland and Stewart Is. Grassland, river terrace, gravel and sand. Coastal to 900m alt.
<i>A. minor</i>	var <i>minor</i> : Auck. Is. and Campbell Is., coastal to mid-altitude slopes and bird colonies. var. <i>antarctica</i> : Antipodes and Macquarie Is., high altitude meadows.
<i>A. pallida</i>	Wellington Harbour, Otago Peninsula, Bluff, Stewart Is. Coastal sand dunes.
<i>A. profundeincisa</i>	North Is., South Is. Montane to alpine grassland and shrubland.
<i>A. rorida</i>	NW Ruahine Range, North Island. Limestone ravines and tussock grassland. Known from only one locality.
<i>A. saccaticupula</i>	South Is. Mainly eastern, montane to alpine herbfield and fellfield.
<i>A. tesca</i>	Otago, almost exclusive to schist bedrock. Upper slopes of block mountains, often in damp sites.

Many *Acaena* species can be distinguished by their vegetative characteristics alone. The following key makes extensive use of these, as plants encountered in the field may not be in flower or fruit. Species known to be naturalised in New Zealand are indicated in the key by asterisks. The key has a dichotomous structure, with the two leads of each couplet



aligned vertically. Feedback on the key is welcomed! Please contact Kelvin Lloyd, Landcare Research, Private Bag 1930, Dunedin, email: lloydk@landcare.cri.nz.

A Key to *Acaena* in New Zealand

Branches erect in tight clumps

Leaflet teeth sharp-pointed; flowers and fruit in short to long spikes

Spines of fruit \pm equal, all lacking thickened bases ... *A. agnipila**

Spines markedly unequal, the larger ones with thickened bases

... *A. echinata**

Leaflet teeth blunt or rounded; flowers and fruit in roughly spherical heads

... *A. glabra*

Branches spreading laterally, flowers and fruit in roughly spherical heads

Plant hairless; leaflets shining green above with red teeth; fruit compressed with 2 lateral wings, each enclosing a single unbarbed spine

... *A. glabra*

Plant hairy; leaflets various; fruit roughly cone-shaped, each with 4 spines, or no spines

Plant rhizomatous; heads of 2-20 fruits, unstalked or on short stalks less than 5cm long; spines not barbed if present (Section Microphyllae)

Leaves glaucous (distinctly bluish green) on upper surface

Leaflets with blunt or rounded teeth lacking hair tip; fruits c. 20 per head, on stalks to 5 cm long ... *A. inermis*

Leaflet teeth sharply pointed with short hair tip; fruits c. 10 per head, in unstalked heads ... *A. tesca*

Leaves green, olive, brown or purplish on upper surface

Leaves rich shining green on upper surface ... *A. microphylla*

Fruits c. 20 per head, held above foliage ... var. *microphylla*

Fruits 2-4 per head, hidden among the leaves

... var. *pauciglochidiata*

Leaves dull green, olive, grey or purplish

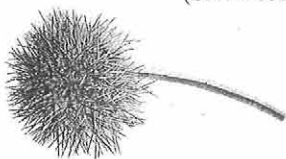
Fruits c. 20 per head; heads on stalks to 5cm long ... *A. inermis*

Fruits c. 10, capitula sessile or on short scapes <2cm long

Leaves olive, apple green or purplish, with distinct pattern of darker veins on upper surface; heads on stalks 0.6-1.5 cm long; fruit spines naked at tip ... *A. rorida*

Leaves milky green or greyish, lacking pattern of darker veins; heads unstalked; fruit spines with soft hairs bent backwards at tip ... *A. buchananii*

Plant stoloniferous; heads of >40 fruits, all bearing 4 barbed spines at maturity; heads on stalks >5cm long (Section Ancistrum, see next page)



(from previous page)

Plant stoloniferous; heads of >40 fruits, all bearing 4 barbed spines at maturity;
heads on stalks >5cm long (Section Ancistrum)

Leaflet teeth hair-tipped

Prostrate stems 2-3.5 mm diameter; leaflets distinctly bluish green, folded
lengthways, upper surface hairless; heads on red or yellowish
stalks ... *A. minor*

Stems <5 cm long; leaves <2cm long; fruits 40-50 per head

... var *minor*

Stems 10-50 cm long; leaves >5cm long; fruits 100-130 per head

... var *antarctica*

Prostrate stems ≤ 2 mm diameter; leaflets bluish green or otherwise, flat,
upper surface almost hairless to very hairy

Leaflets distinctly bluish green on upper surface

Stipules entire to double-toothed; leaflets abundantly hairy on both
sides, lower 1/3 untoothed; leaflet teeth serrate; heads on
pale brown, hairy stalks; anthers white ... *A. caesiiglauca*

Stipules deeply 3-5-toothed; leaflets ± hairless on upper surface and
toothed to base; leaflet teeth rounded; heads on purplish,
almost hairless stalks; anthers red ... *A. fissistipula*

Leaflets green or ashy grey on upper surface, but not blue-green.

Prostrate stems 1.5-2 mm diameter, young stems sometimes reddish;
upper leaf surface ± shining and hairless or sparsely hairy;
florets 70-100, in heads 15-35 mm diameter (incl. spines) at
maturity ... *A. novae-zelandiae*

Prostrate stems < 1.5 mm, green or brown; upper surface ashy grey
to dull green, sparsely to densely hairy; florets 40-60, in
heads 10-15 mm diameter at maturity.

Leaflets pale green to ashy grey on upper surface, 5-11-toothed;
leaflet teeth broad-based and deeply incised, some more
than 1.5 mm long; heads on pale green or reddish stalks;
anthers red ... *A. profundicisa*

Leaflets green on upper surface, 7-15 toothed; leaflet teeth not
more than 1 mm long, small and narrow-based; scapes
brown; anthers white

Stipules entire to two-toothed; upper leaflets usually
rounded; leaflet pairs abruptly reduced in size below
the 1-2 uppermost ... *A. juvenca*

Stipules 3- to 8-toothed; distal leaflets usually oblong;
leaflet pairs gradually reducing in size down the
midrib ... *A. anserinifolia*

Leaflet teeth without hair tips (see next page)



(from previous page)

Leaflet teeth without hairtips

Leaves (at least the younger ones) rich shining green on upper surface

Prostrate stems 1.5-2 mm diameter; leaves 30-60 mm long; terminal leaflet 9-12 mm long; leaflets smooth on upper surface

... *A. novae-zelandiae*

Prostrate stems 2-3 mm diameter; leaves 45-100 mm long; terminal leaflet 12-20 mm long; leaflets slightly wrinkled on upper surface

... *A. pallida*

Leaves dull green to slightly bluish green on upper surface

Prostrate stems ≤ 1 mm diameter; leaflets 7-11; leaflet pairs abruptly reducing in size below the 1-2 uppermost; heads on brown stalks 4-13 cm long; anthers white

Prostrate stems very slender, 0.7 mm in diameter; leaflets green, upper surface hairless; leaflet teeth 7-9, blunt ... *A. emittens*

Prostrate stems 1 mm diameter; leaflets somewhat bluish green with upper surface sparsely hairy; leaflet teeth 11-15, sharply pointed... *A. dumicola*

Prostrate stems ≥ 1 mm diameter; leaflets 11-17; leaflet pairs gradually reducing in size down the midrib; leaflet teeth 5-9; heads on red stalks 9-30 cm long; anthers red

Prostrate stems ≥ 2 mm diameter; leaflets green on upper surface with purplish secondary colouring, 9-14 toothed; head about 12 mm diameter when flowering, 10-30 mm diameter when mature

... *A. magellanica*

Prostrate stems 1-1.7 mm diameter; leaflets bluish green on both surfaces, 5-8 toothed; head 6-9 mm diameter when flowering, <15 mm diameter when mature ... *A. saccaticupula*



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