

Malva pseudolavatera *
 (*Lavatera cretica*)
Matricaria discoidea *
Medicago lupulina *
Medicago nigra *
Mentha pulegium *
Modiola caroliniana *
Myosotis arvensis *
Myosotis sylvatica *
Oenanthe pimpinelloides *
Orobanche minor *
Oxalis corniculata *
Oxalis incarnata *
Parentucella viscosa *
Pericallis × hybrida *
Persicaria capitata *
Persicaria maculosa *
Physalis peruviana *
Plantago australis *
Plantago coronopus *
Plantago lanceolata *
Plantago major *
Plectranthus ciliatus *
Polycarpon tetraphyllum *
Portulaca oleracea *
Potentilla indica *

Potentilla reptans *
Prunella vulgaris *
Ranunculus parviflorus *
Ranunculus repens *
Ranunculus sardous *
Raphanus raphanistrum *
Rorippa nasturtium-aquaticum *
Rumex acetosella *
Rumex brownii *
Rumex conglomeratus *
Rumex crispus *
Rumex obtusifolius *
Rumex pulcher *
Rumex sagittatus *
Sagina procumbens *
Senecio bipinnatisectus *
Senecio esleri *
Senecio skirrhodon *
Senecio vulgaris *
Sherardia arvensis *
Silene gallica *
Sison amomum *
Sisymbrium officinale *
Solanum chenopodioides *
Solanum nigrum *
Sonchus asper *

Sonchus oleraceus *
Stachys arvensis *
Stellaria media *
Symphotrichum subulatum *
Taraxacum officinale *
Tolpis barbata * (P.Hynes,
 7 Nov 1951, AK 144334)
Torilis arvensis *
Trifolium campestre *
Trifolium dubium *
Trifolium perenne *
Trifolium repens *
Trifolium subterraneum *
Tropaeolum majus *
Valerianella carinata *
Verbascum virgatum *
Verbena incompta *
Veronica arvensis *
Veronica filiformis *
Veronica persica *
Veronica serpyllifolia *
Vicia disperma *
Vicia sativa *
Vicia tetrasperma *

Occurrence of *Crassula helmsii* in Auckland

Mike Wilcox

Introduction

Crassula helmsii is a perennial herb native to both New Zealand and Australia. In New Zealand it is mainly confined to the west coast of the South Island, while in Australia it is widespread in the eastern states (e.g. Toelken et al. 1996). Its main claim to fame is that it has become a serious aquatic weed in Britain. Known there as New Zealand pygmyweed or Australian swamp-stonecrop, *Crassula helmsii* arrived in the UK in 1911. It was introduced as an oxygenating plant for ponds and was not recognised as a serious threat until the 1970s (Laundon 1961; Dawson 2014; Stace & Crawley 2016). It reproduces from tiny stem fragments and can be submerged, emergent (at the edges of water bodies) or terrestrial, growing in and around ponds, lakes and slow moving water courses. Left to its own devices, it forms an impenetrable green mat, pushing out plant and animal species and damaging wetland



Fig. 1. Habitat of *Crassula helmsii* on a gravel access road beside treated effluent outflow lagoon, Puketutu Island, Manukau Harbour, Auckland, 5 Dec 2016.



Fig. 2. Mat-form of *Crassula helmsii* growing in open, Puketutu Island, 5 Dec 2016.

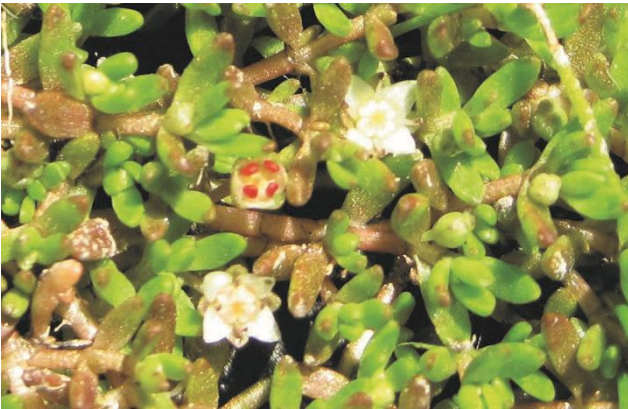


Fig. 3. Showing succulent leaves, flower and seeds, Puketutu Island, 5 Dec 2016.



Fig. 4. Erect shade-form of *Crassula helmsii*, Puketutu Island, 5 Dec 2016.



Fig. 5. Flower of *Crassula helmsii*, Puketutu Island, 5 Dec 2016.

habitats (Anon 2007). Pygmyweed grows all year round and produces small white flowers in Britain from June to September.

Discovery in Auckland and identifying features

On 26 March 2016 in the company of Peter Maddison, I first found *Crassula helmsii* at Puketutu Island (Manukau Harbour), and then on 17 June 2016 at Seaside Park in Otahuhu (Tamaki River). At first I took it to be *Crassula ruamahanga* (including *C. hunua*), but on closer examination (including of cultivated plants in a tray of water at home) its morphology indicated that it was *C. helmsii*.

On Puketutu Island the site is an overgrown gravel access road running beside the outlet lagoon from the Mangere Water Treatment plant (Fig. 1). The habitat is damp most of the time with freshwater seepage from the inland margin and periodic water lapping from the lagoon. *Crassula helmsii* occupies an 80 m stretch of the road, growing in wet gravel and mud as a creeping low turf in the open (Figs. 2, 3), but with an erect, more slender habit in wetter, sheltered, semi-shaded margins (Fig. 4). Accompanying plants are *Rhizoclonium riparium* (a filamentous green alga), *Vaucheria geminata* (a yellow-green alga), *Limosella lineata*, *Lythrum hyssopifolia*, *Veronica anagallis-aquatica* and *Cynodon dactylon*.

Puketutu Island turf material has thick succulent leaves typically 4 mm long × 1 mm wide, with a flattened upper surface and convex lower surface. They are opposite, oblong in shape, with blunt tips, tending to be somewhat sharp-pointed on leaves near the shoot tips. They are mostly green, but some assume a reddish tinge (Fig.3). These leaf features identify it as *C. helmsii* according to the key provided by Sykes (2005) and de Lange et al. (2008), and the description in Webb et al. (1984). The flowers are borne singly on pedicels c. 5 mm long in leaf axils, and have been seen from late November to March (Fig. 5). The flower morphology is in agreement with descriptions of New Zealand *Crassula helmsii* (e.g. Webb et al. 1984) except that the calyx lobes (sepals tips) of the Puketutu Island plants are clearly obtuse, not acute, though Tolkien et al. (1996) describes them as acute to obtuse in Victoria.

In cultivation indoors (on a window ledge) the growth became erect, soft and rank, with stems etiolating up to 16 cm tall with 3 cm-long internodes, and were completely green in colour (Fig. 6). Flowers were produced, but were smaller than on plants in the wild.

The second occurrence of *Crassula helmsii* found in June 2016 beside a concrete boat ramp at Seaside Park, Tamaki River, Otahuhu (Fig. 7), did not persist and seems to have been killed off during weed-spraying operations.

Origin of the Auckland population

Apart from a colony (presumed naturalised) at the Hamilton Lake (P. Champion and P. de Lange, pers. comm.) and cultivated plants in an aquarium at the Auckland Zoo ex Oratia Nursery (Ben Goodwin, pers. comm.), there are no previous records of *Crassula helmsii* in New Zealand beyond its known range on the west coast of the South Island. This is surprising considering its invasiveness in Britain, where it has spread by vegetative fragmentation. The Puketutu Island site is next to a lagoon which is much frequented by waterfowl, including spoonbill, black swan, Canada goose, mallard, paradise duck, shoveler and grey teal – this last being a well-known trans-Tasman traveller. Perhaps birds brought the plant there from the South Island or from Australia. That calyx lobes can be obtuse is not mentioned in any previous description of the flowers from New Zealand, but is noted in Australian plants (Tolkien et al. 1996).

Herbarium samples

Puketutu Island, *M.D. Wilcox*, 26 Mar 2016,
AK 362509.

Seaside Park, Otahuhu, *M.D. Wilcox*, 17 Jun 2016,
AK 362516.

Acknowledgements

Thanks to Paul Champion (NIWA, Hamilton) and Ben Goodwin (Auckland Zoo) for examining Puketutu Island material and comparing it with *Crassula helmsii* in cultivation. Peter de Lange commented that Puketutu Island material seen by him looked more like *Crassula ruamahanga*.

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Fig. 6. *Crassula helmsii* cultivated in a tray of water, 16 Oct 2017.



Fig. 7. Erect form of *Crassula helmsii*, Seaside Park, Otahuhu, Tamaki River, 17 June 2016.