

Sedum caespitosum (Crassulaceae) naturalised in New South Wales, Australia

Phillip G. Kodela

Royal Botanic Gardens & Domain Trust, Mrs Macquaries Road, Sydney NSW 2000, Australia.
phillip.kodela@rbgsyd.nsw.gov.au

Abstract

The small, annual herb *Sedum caespitosum* (Cav.) DC. (Crassulaceae), native to the Mediterranean, was first recorded as naturalised in New South Wales in 2009 from near Orange and more recently in 2014 from near Goulburn. In both localities it was recorded from roadside areas, often being locally common and forming dense colonies. The ability of this species to grow in challenging habitats, as seen in its natural habitats overseas, in association with occurring in roadside localities, indicates *S. caespitosum* has the potential to become more widespread as a roadside weed with the possibility of spreading into new regions and other habitats. A description of the species is provided as well as a key to the species of *Sedum* occurring in New South Wales.

Introduction

Sedum caespitosum (Cav.) DC. (Crassulaceae), commonly known as Tiny Stonecrop or Broad-leaved Stonecrop, is a small annual herb native to Mediterranean and sub-Mediterranean regions of Europe, the Middle East and northern Africa where it commonly grows in skeletal soils, often in rocky or stony areas. In Australia, it was previously known only from Victoria (Toelken et al. 1996, Willis 1972), with the earliest herbarium specimen collected from near Creswick in 1934 (held at MEL; CHAH 2015a). It was first recorded as naturalised in New South Wales in 2009 from Lucknow near Orange and more recently in 2014 from an area along the Hume Highway near Goulburn.

Like many plants currently recognised as part of the flora of New South Wales and included in published floras (eg Harden 1990–1993, 2000, 2002, PlantNET 1999 onwards), *Sedum caespitosum* came to the attention of staff at the National Herbarium of New South Wales (NSW) from specimens received for identification or advice. This paper provides an account of the first naturalised records of the taxon in the State and alerts readers of a new introduction and possible weed threat. With this awareness, the description and illustrations will assist with the identification of *S. caespitosum* and provide information for including its distribution in New South Wales in the *Australian Plant Census* (CHAH 2015b).

Methods

The description of *Sedum caespitosum* is based mainly on morphological observations and assessment of specimens from New South Wales held at NSW (including duplicates distributed to other herbaria), as well as Australian flora treatments, including Kodela (2014), Toelken et al. (1996) and Willis (1972). Botanical regions cited for New South Wales follow those of Anderson (1961) and Jacobs and Pickard (1981).

Description

Sedum caespitosum (Cav.) DC. *Prodromus Systematis Naturalis Regni Vegetabilis* 3: 405 (1828)

Crassula caespitosa Cav., *Icones et Descriptiones Plantarum* 1: 50, tab. 69, fig. 2 (1791); *Tillaea rubra* L., *Species Plantarum* 1: 129. (1753); *Sedum rubrum* (L.) Thell., *Repertorium Specierum Novarum Regni Vegetabilis* 10: 290 (1912), nom. illeg.

Illustrations: Anonymous (2015a), Castroviejo and Velayos (1997, p. 141, lam. 39a–g), Hart and Egli (2003, p. 42), Richardson et al. (2011, p. 282), Scheda Botanica (2015), Stephenson (1994, p. 107, fig. 5.10), Toelken et al. (1996, p. 554, fig. 114d).

Erect annual herb 1–5(–6) cm high, single-stemmed or with several branches above (the stems sometimes irregularly bent), glabrous, green to reddish. Leaves succulent, ovate to broadly elliptic or elliptic-oblong, sometimes obovate, obtuse, (2–)3–6 mm long, alternate, often overlapping, sessile, green or reddish, caducous. Flowers 1–3, in short terminal cymes, sessile, 4- or 5-merous; sepals ovate to triangular, acute, c. 1 mm long; petals narrowly lanceolate to elliptic, acute to acuminate, to 3 mm long, white often tinged red or pinkish red, often with red or green keel, ascending-spreading; stamens 4 or 5. Fruit follicles to c. 4 mm long, narrow, stellately spreading, apically pointed; seeds ± ellipsoid, c. 0.5 mm long, pale brown, finely costate with longitudinal ridges. Some plants may be diminutive with smaller features than described above. **Figs 1, 2**

Notes: Extra-Australian descriptions of the species indicate that plants can be taller (to 15 cm high) and with larger flowers (petals to 4 mm long) than seen in New South Wales (Anonymous 2015b, Bayer et al. 1989, Castroviejo and Velayos 1997, Duchoň 2012, Hart and Egli 2003, Stephenson 1994). *Sedum caespitosum* is characterised by its rapidly spreading, narrow, acute carpels maturing brown-red (the wide-spreading carpels are patent soon after the buds burst), a single whorl of stamens, and narrow, ephemeral petals (Stephenson 1994). The foliage turns red in full sun. Plants can form dense mats and dominate the ground cover, which can often be observed as prominent red patches.

Flowering: spring and summer.

Distribution: native to southern Europe and parts of the Middle East (Western Asia), from Portugal to Syria and Israel, and in northern Africa in Morocco; probably eastern Mediterranean origin (Duchoň 2012, Hart and Egli 2003). In Australia, *Sedum caespitosum* is naturalised in Victoria (several records, including the areas between Melbourne and Geelong, between Clunes and Creswick, Hepburn and near Macedon), and in New South Wales (known from near Orange and southwest of Goulburn).

Habitat and abundance: in its natural habitats, *Sedum caespitosum* occurs in rocky and stony places, commonly in shallow, often gravelly soils; also in disturbed places such as roads and pastures. In Australia, it has been recorded in open areas, disturbed roadside verges, grassy areas, mown areas; often locally common.

At Lucknow (see NSW798617, NSW798618), *Sedum caespitosum* was growing in a roadside locality in a mowed, shallow rocky area, adjoining a car park. Plants were bright red in colour through to green and there were more than 1,000 plants covering an area of 30 square metres. Near Goulburn (see NSW870840), *S. caespitosum* was growing on a medium strip verge near a highway, in skeletal soil/detritus atop of pavement (not in grass and weeds), being most prolific on turning bay areas. The small succulent plants were ruby red in full sun, green in partial shade, localised but common, forming dense colonies. **Figs 3, 4**

Specimens examined: NEW SOUTH WALES: CENTRAL TABLELANDS: corner Millthorpe Road and Mitchell Highway, Lucknow, *N. Boyd s.n.*, 28 Sep 2009 (NSW798617); *ibid.* *N. Boyd s.n.*, Nov 2009 (NSW798618); SOUTHERN TABLELANDS: Hume Highway medium strip verge between Federal Highway junction and Wollagorang Creek, [SW of Goulburn], *R.T. Miller & J. Miller s.n.*, 3 Oct 2014 (AD, BRI, CANB, MEL, NSW870840).

Weed status: *Sedum caespitosum* is not listed as a declared noxious or invasive weed species, and has not been reported as a major weed problem causing significant impacts; there being only a limited number of accounts in Australia. Its inclusion in international weed lists such as HEAR (2015) and Randall (2002, 2012) is based on weed reports for Victoria.

The fine seeds of *Sedum caespitosum* would be spread by wind and water, as well as potentially be transported in the movement of soil and turf such as in the case of roadside works or in the traction of vehicle tyres. Roadways provide ideal corridors for the spread of many naturalised taxa. In New South Wales *S. caespitosum* is currently only known from disturbed sites, with no reports as an environmental or agricultural weed. It does however have the potential to spread and form large colonies that could possibly compete with other annual species. This alert to the presence of *S. caespitosum* in New South Wales is a step towards increasing awareness of its presence which may lead to further findings and a better understanding of its weed potential.



Fig. 1. *Sedum caespitosum* specimens showing variation in foliage colour from green to red (voucher NSW870840 *p.p.*).



Fig. 2. Fertile stems of *Sedum caespitosum* showing white to pink or reddish tinged inflorescence and succulent leaves (voucher NSW870840 *p.p.*).

Confusing species: *Sedum caespitosum* is one of ten *Sedum* taxa naturalised in Australia (CHAH 2015b). In New South Wales where there are five species, *S. album* and *S. acre* have leaf sizes within the range of *S. caespitosum*, however these species are distinguished by different habits, leaf features and/or flowers (see key below). Some *Crassula* species may look similar but are distinguished from *Sedum* by the flowers, where *Crassula* has as many stamens as petals while in *Sedum* there are twice as many stamens as there are petals. Infertile plants of *Sedum caespitosum* could possibly be mistaken for other low herbaceous species with small leaves.

Key to the species of *Sedum* in New South Wales

(Modified from Everett and Norris 2015)

- 1 Flowers white, pink or tinged red
 - 2 Perennial mat-forming herb to laxly tufted subshrub with creeping woody stems; leaves 4–12 mm long; inflorescence a dense ± corymbose cyme; petals white or rarely pink *S. album*
 - 2: Annual herb with erect or sometimes bent stem(s), single-stemmed to several-branched; leaves 2–6 mm long; inflorescence a short terminal 1–3 flowered cyme; petals white often tinged red or pinkish red ..
..... *S. caespitosum*
- 1: Flowers yellow
 - 3 Leaves 30–50 mm long, spatulate *S. praealtum*
 - 3: Leaves not as above
 - 4 Leaves linear-terete, 6–12 mm long; flowers usually 7-merous *S. rupestre*
 - 4: Leaves triangular to ovoid, to 5 mm long; flowers mostly 5-merous *S. acre*



Fig. 3. *Sedum caespitosum* growing alongside the Hume Highway near Goulburn, New South Wales (voucher NSW870840); the locally abundant population occurs as dense red patches and scattered plants in the roadside verge. Photo: R. Miller.



Fig. 4. Patch of *Sedum caespitosum* at site near Goulburn, showing the small herb habit of the plants that are commonly reddish in areas of full sunlight (voucher NSW870840). Photo: R. Miller.

Acknowledgments

Robert Miller kindly provided specimens, details and photographs of the plants from near Goulburn (New South Wales), which were identified by Hellmut Toelken (AD). I am grateful to Matthew Baker (HO), John Hosking and the editors for constructive comments that improved the paper.

References

- Anderson RH (1961) Introduction. *Contributions of the New South Wales National Herbarium* 1–18: 1–15
- Anonymous (2015a) Altri Titolo: Broad Leaved Stonecrop - *Sedum caespitosum*. *Natura Italiana*. <http://luirig.altervista.org/naturaitaliana/viewpics2.php?rcn=48138> (accessed April 2015)
- Anonymous (2015b) *Sedum caespitosum* in www.cretanflora.com <http://www.cretanflora.com/sedum-caespitosum.html> (accessed April 2015)
- Bayer E, Buttler KP, Finkenzeller X, Grau J (1989) *Plantas del Mediterráneo [Plants of the Mediterranean]* (Blume: Barcelona)
- Castroviejo S, Velayos M (1997) *Sedum*, in Castroviejo S (ed.), *Flora Iberica* 5: 121–153 (Real Jardín Botánico, CSIC: Madrid) http://www.floraiberica.es/floraiberica/texto/pdfs/05_085_07%20Sedum.pdf
- CHAH (2015a) AVH - *Australia's Virtual Herbarium*. <http://avh.chah.org.au/> (accessed April 2015)
- CHAH (2015b) *Australian Plant Census*. Council of Heads of Australasian Herbaria. Centre for Australian National Biodiversity Research. <http://www.chah.gov.au/apc/index.html>
- Duchoň M (2012) *Sedum caespitosum* (Cav.) DC., *Botany.cz* <http://botany.cz/en/sedum-caespitosum/> (accessed April 2015)
- Everett J, Norris EH (2015) Genus *Sedum*. In PlantNET – *New South Wales flora online*. <http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=gn&name=Sedum> (accessed August 2015)
- Harden GJ (ed.) (1990–1993) *Flora of New South Wales* Volumes 1–4. (New South Wales University Press: Sydney)
- Harden GJ (ed.) (2000) *Flora of New South Wales* Volume 1 – revised edn. (New South Wales University Press: Sydney)
- Harden GJ (ed.) (2002) *Flora of New South Wales* Volume 2 – revised/2nd edn. (New South Wales University Press: Sydney)

- Hart H, Eggli U (2003) *Sedums of Europe: stonecrops and wallpeppers*. (AA Balkema: Rotterdam)
- HEAR (2005) *Global Compendium of Weeds: Sedum caespitosum (Crassulaceae)* http://www.hear.org/gcw/species/sedum_caespitosum/ (accessed August 2015)
- Jacobs SWL, Pickard J (1981) *Plants of New South Wales* (D West, Government Printer: Sydney) 226 pp.
- Kodala PG (2015) *Sedum caespitosum* (Cav.) DC. In 'PlantNET – New South Wales flora online' <http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Sedum~caespitosum> (accessed August 2015)
- PlantNET (1999 onwards) *New South Wales Flora Online* <http://plantnet.rbgsyd.nsw.gov.au/floraonline.htm> (accessed August 2015)
- Randall RP (2002) *A global compendium of weeds*. (RG and FJ Richardson: Meredith, Melbourne)
- Randall RP (2012) *A global compendium of weeds* 2nd edn. (Department of Agriculture and Food, Western Australia: Perth)
- Richardson FJ, Richardson RG, Shepherd RCH (2011) *Weeds of the South-East. An identification guide for Australia* 2nd edn. (RG and FJ Richardson: Meredith)
- Scheda Botanica (2015) *Sedum caespitosum* (Cav.) DC. Scheda Botanica plant profile. <http://luirig.altervista.org/flora/taxa/index1.php?scientific-name=sedum+caespitosum> (accessed April 2015)
- Stephenson R (1994) *Sedum: cultivated stonecrops*. (Timber Press: Portland)
- Toelken HR, Jeanes JA, Stajsic V (1996) Crassulaceae, pp. 542–554, in Walsh NG, Entwisle TJ (eds), *Flora of Victoria* Volume 3, *Dicotyledons Winteraceae to Myrtaceae* (Inkata Press: Melbourne). *VicFlora*: <http://data.rbg.vic.gov.au/vicflora/flora/taxon/d031d8ca-8e1c-4823-b9ad-99e0cf4bde5c>
- Willis JH (1972 [1973]) *A handbook to plants in Victoria* Volume 2 (Melbourne University Press: Carlton)

Manuscript received 22 May 2015, accepted 29 September 2015