

***CALYSTEGIA ?SILVATICA* (CONVOLVULACEAE) IN BROADWATER NATURE RESERVE; A TARGET FOR ERADICATION.**

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Introduction

During surveys of the Swan Coastal Plain Reserves in the Busselton area for Swan Bioplan a sterile vine was found around wetlands in Broadwater Nature Reserve. When flowering material of this vine was collected (voucher GJ & BJ Keighery 890, PERTH) it was clear that this plant did not correspond to any currently listed member of the genus *Calystegia* recorded for Western Australia (Figure 1).

Members of the genus are *Calystegia* difficult to identify. Fang and Brummitt (1995) note that *Calystegia* comprises

Approximately 70 intergrading subspecific taxa which can be arbitrarily combined into about 25 species: mostly temperate but sparingly extending to the tropics. Nearly all taxa in *Calystegia* intergrade geographically into neighbouring taxa with the exception of the widespread coastal species, *C. soldanella* (Linnaeus) R. Brown. Almost half of the genus is endemic in California, U.S.A. It is impossible to draw clearly defined specific limits, and intermediate forms are always found where two taxa approximate geographically.

***Calystegia* in Western Australia**

Five species of *Calystegia* are recorded in Australia (Table 1), including a naturalised weed, *Calystegia silvatica*. Western Australia has two recorded native species of *Calystegia* - *C. soldanella* and *C. sepium*. *C. soldanella* is a rarely recorded plant of coastal fore-dunes at Margaret River and Walpole. *C. sepium* is even more poorly known. There are no specimens of *C. sepium* in PERTH and there are only 4 old collections in the Melbourne Herbarium from the Warren and Southern Jarrah Forest Bioregions.

Identity of the Broadwater *Calystegia*

Based on checks of a set of keys and floras the population at Broadwater falls into the *Calystegia sepium* –*sylvatica* complex (Table 2). This is a sub-cosmopolitan species group centred on the Northern Hemisphere. Three species have been described in the complex - *C. sepium*, *C. silvatica* and *C. pulchra* (?horticultural derivative). Nine subspecies have been described in *C. sepium* and at least four described in *C. silvatica*.

The collections from Broadwater are completely glabrous despite having the large pink flowers normally characteristic of *C. pulchra* (Figure 1) and are therefore excluded from that species.

Another distinguishing feature of the flowers is the overlapping inflated (saccate) bracteoles which cover the base of the flower and hide the sepals. This is a key character in all recent keys and floras in the Northern Hemisphere (eg: Stace, CA and

Hilli Thompson, 1997) used to separate *C. silvatica* from *C. sepium* but the large pink flowers are atypical of *C. silvatica*. Ogden (1979) in his detailed study of *Calystegia* populations in New Zealand provisionally allocated plants with this character set (pink flowers, overlapping saccate bracteoles with a deep sinus) as hybrids between *Calystegia sepium* and *C. silvatica* (several named, partially fertile hybrids are known, Table 2). However, the Broadwater population is highly seed fertile, suggesting it may be a horticultural selection of *Calystegia silvatica* rather than a hybrid.

This species is certainly a weed. It does not fit current limits of the native Australian *Calystegia* collections allocated to *C. sepium* or the characteristics of the native species – both are small flowered, white in colour with non inflated and non overlapping bracteoles.

The New Zealand material of the common form of *C. sepium* (Webb *et al.*, 1988) has small often pink flowers with short peduncles, non inflated and non overlapping bracteoles. This is considered as a native un-named subspecies, perhaps closely related to *C. sepium* subsp. *americana*. The other form is similar to the Australian collections and is considered introduced! Similar issues may be present in Australia.

On current evidence the population at Broadwater is a naturalised alien, closest to *Calystegia silvatica*.

Management of *Calystegia*

This weed is probably a very recent introduction into the Broadwater Nature Reserve from nearby gardens either as dumped refuse or seed. As can be seen in the accompanying photo (Figure 2) it is highly aggressive, smothering vegetation and spreading rapidly.

Both *Calystegia silvatica* and the closely related *Calystegia sepium* are attractive plants with showy flowers. However, because of its quick growth and clinging vines, it can overwhelm and pull down cultivated plants including shrubs and small trees. Its aggressive self-seeding (seeds can remain viable as long as 30 years) and the success of its creeping roots (they can be as long as 3-4 m) cause it to be a persistent weed and have led to its classification as a noxious weed (Wikipedia). The suggested method of eradicating *Calystegia sepium* is vigilant hand weeding.

Recommendation

Since the species is currently confined to the wetland around Swamp Hen Lane and is highly visible during summer when water levels are low it would be an ideal target for eradication before it spreads through the Bussellton wetlands.

References

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Table One: *Calystegia* Species Recorded for Australia

(Source Australian Plant Census, <http://www.cpbr.gov.au/chah/apc/index.html>)

Calystegia affinis Endl.
Lord Howe & Norfolk Islands

Calystegia marginata R.Br.
Qld, NSW & Vic

Calystegia sepium (L.) R.Br.
(WA, SA, NSW, Vic, Tas)
Only Vic and SA currently recognise subspecies in this species.

Calystegia sepium subsp. *roseata* Brummitt
Vic, SA (Not annotated as a weed, but unlikely to be native)

**Calystegia silvatica* (Kit.) Griseb.
Only SA and Vic use subspecific rank in this species.
SA (naturalised), NSW (naturalised), Vic (naturalised), Tas (naturalised)

**Calystegia silvatica* (Kit.) Griseb. subsp. *disjuncta* Brummitt
Vic (naturalised)

**Calystegia silvatica* (Kit.) Griseb. subsp. *silvatica*
SA (naturalised), Vic (naturalised)

Calystegia soldanella (L.) Roem. et Schult.
WA, SA, Tas, Vic, NSW

Table 2 Taxa in the *Calystegia sepium/silvaticum* complex

- *Calystegia sepium* subsp. *americana*. North America.
- *Calystegia sepium* subsp. *angulata*. North America.
- *Calystegia sepium* subsp. *appalachiana*. Eastern North America.
- *Calystegia sepium* subsp. *binghamiae*. Western North America (California).
- *Calystegia sepium* subsp. *erratica*. North America.
- *Calystegia sepium* subsp. *limnophila*. Southern North America.
- *Calystegia sepium* subsp. *roseata*. Western Europe, coasts. Flowers pink.
- *Calystegia sepium* subsp. *sepium*. Europe, Asia.
- *Calystegia sepium* subsp. *spectabilis*. Siberia. Flowers often pinkish.
- *Calystegia pulchra*
- *Calystegia silvatica* subsp. *disjuncta* Europe
- *Calystegia silvatica* subsp. *fraterniflora* North America
- *Calystegia silvatica* subsp. *orientalis* Asia
- *Calystegia silvatica* subsp. *silvatica* Europe

Hybrid Taxa (both have pink flowers)

- *Calystegia* x *scania* (*C. sepium* x *pulchra*) UK
- *Calystegia* x *howittorum* (*C. pulchra* x *silvatica*) UK

Figure 1: Flowers of *Calystegia ?silvatica* at Broadwater Nature Reserve



Figure 2: Rampant smothering vines of *Calystegia ?silvatica* at Broadwater Nature Reserve

