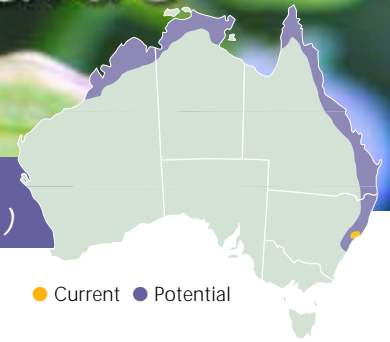


Weed Management Guide

Chinese violet
(*Asystasia gangetica* ssp. *micrantha*)



● Current ● Potential

Chinese violet (*Asystasia gangetica* ssp. *micrantha*)

The problem

Asystasia gangetica subspecies (ssp.) *micrantha* is on the *Alert List for Environmental Weeds*, a list of 28 non-native plants that threaten biodiversity and cause other environmental damage. Although only in the early stages of establishment, these weeds have the potential to seriously degrade Australia's ecosystems.

A. gangetica ssp. *micrantha* is a form of Chinese violet. As an environmental weed, it smothers other ground plants and displaces vegetation, which reduces the availability of habitat for native plants and animals and therefore reduces biodiversity.

It is a major weed overseas, particularly in Malaysia, Indonesia and the Pacific

islands. In these places it infests plantations, particularly oil-palm crops, and competes effectively for soil nutrients, reducing productivity and increasing crop management costs. It could also become an agricultural weed in Australia.

Another closely related species, *Asystasia gangetica* ssp. *gangetica*, has also become naturalised in the Northern Territory and Queensland.

The weed

A. gangetica ssp. *micrantha* is a perennial creeper that grows rapidly, up to 0.5 m high alone but to 3 m high on supporting vegetation. It forms roots when the nodes (the joins between segments on the stem) make contact with moist soil, ultimately forming mats or a sprawling mass of

stems similar to those of *Tradescantia fluminensis*, commonly known as wandering creeper.

Both the leaves and the stems have scattered hairs. Occurring in opposite pairs, the leaves are oval, sometimes nearly triangular in shape, paler on the underside, and may be up to 25-165 mm long and 5-55 mm wide. White bell-shaped flowers, 20-25 mm long, have purple blotches in two parallel lines inside. The seed capsules are about 30 mm long, club-shaped (the neck is attached to the stem) and contain four flattened seeds held in place by conspicuous hooks.



The two parallel purple stripes within the white flower are a distinctive feature of *A. gangetica* ssp. *micrantha*.

Photo: Graham Prichard, Port Stephens Council, NSW

Key points

- *Asystasia gangetica* ssp. *micrantha* is a mat-forming creeper which can smother more desirable plants.
- Prevention and early intervention are the most cost-effective forms of weed control.
- Avoid creating bare areas where *A. gangetica* ssp. *micrantha* and other weeds can invade.
- If you see a plant that may be *A. gangetica* ssp. *micrantha*, contact your local council or state or territory weed management agency. Do not attempt control on your own, as it can spread very easily from both seeds and stems.



Growth calendar

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering	■	■	■	■	■	■	■	■	■	■	■	■
Seed formation	■	■	■	■	■	■	■	■	■	■	■	■
Seed drop	■	■	■	■	■	■	■	■	■	■	■	■
Regrowth	■	■	■								■	■
Germination	■	■	■	■							■	■

■ General pattern of growth ■ Growth pattern in suitable conditions

A. gangetica ssp. *micrantha* can flower and fruit year round. In the Port Stephens area in New South Wales, it grows rapidly following germination and throughout flowering and seed capsule production. In the final stage of its life cycle, the plant dies back to ground level after most of the ripe capsules have released their seeds. Winter frosts kill the above-ground plant parts but plants regrow the following spring from basal shoots.

In tropical climates plant growth is probably continuous, especially in moist conditions or following rainfall.



The seeds are released when the seed capsules dry out.
Photo: Graham Prichard, Port Stephens Council, NSW

How it spreads

A. gangetica ssp. *micrantha* spreads by seeds, which are released explosively from drying capsules, and by trailing stems that can produce roots when nodes make contact with moist soil. The main method of dispersal over long distances is by human activities, such as mining, gardening, landscaping and roadworks. The dumping of garden waste is thought to have caused most of the outbreaks in New South Wales, although it has also spread at a great rate from garden plantings.

Where it grows

A. gangetica ssp. *micrantha* grows in tropical and subtropical areas. It is native to India, the Malay Peninsula and Africa. It was first recorded as naturalised in Australia at Boat Harbour, north of Newcastle, New South Wales, in 1999. Infestations have now been identified at nearby Anna Bay and Fern Bay. These infestations are spread over a distance of 9 km and range in size from 2 square metres to several hectares. Most of the infestations are small and occur on vacant residential land, along fencelines and in

neglected garden beds. Several larger outbreaks are present along roadsides and on crown land.

In all these cases the plant is found on coastal sandy soils but it is thought to tolerate a wide range of soil types. It prefers full sun or part shade. Plants in deep shade do not thrive and become spindly, awaiting a break in the canopy. Often, plants in more exposed sites show some yellowing of the leaves, especially during winter.

A. gangetica ssp. *micrantha* was cultivated in the Darwin Botanic Gardens but it appears to have been eradicated by persistent manual removal and by allowing other plants to outcompete it in shady areas.

Why we need to be 'alert' to *A. gangetica* ssp. *micrantha*

Both subspecies of *A. gangetica* are problem weeds throughout much of South-East Asia, including Malaysia, Indonesia, Papua New Guinea and the Pacific islands. They both grow widely as weeds in rubber, oil-palm, coffee and other crops, but *A. gangetica* ssp.



Most infestations north of Newcastle, NSW, occur on vacant residential land, along fencelines, and in abandoned flower beds and adjacent bushlands.
Photo: Andrew Storrie, NSW Agriculture



Another subspecies of *Asystasia gangetica*

A. gangetica ssp. *gangetica* is less weedy and is planted widely in Australia. Its flowers are 30–40 mm long and blue–mauve in colour, whereas *A. gangetica* ssp. *micrantha* has slightly shorter flowers that are mainly white. *A. gangetica* ssp. *gangetica* is naturalised at Port Douglas in Queensland and at Bartalumba Bay and Groote Eylandt in the Northern Territory. There is also at least one Australian native species of *Asystasia* (*A. australasica*), which occurs in northern Queensland.

micrantha is particularly troublesome in oil-palm plantations. If it became established in Australia, it could potentially affect crops such as soybeans, vegetables, cut flowers and oil-teatree. Its success over a wide geographical range is due to its fast establishment, rapid growth rate, early flowering and high seed production.

As an environmental weed, it could have similarly significant effects, smothering native vegetation and destroying the habitat of many birds and animals. It has shown a tolerance to a range of subtropical and tropical climates, and could be suited to a large part of Australia's environment.

What to do about it

Prevention is better than the cure

As with all weed management, prevention is better and more cost-effective than control. The annual cost of weeds to agriculture in Australia, in terms of decreased productivity and management costs, is conservatively estimated at \$4 billion. Environmental impacts are also significant and lead to a loss of biodiversity. To limit escalation of these impacts, it is vital to prevent further introduction of new weed species, such as *A. gangetica* ssp. *micrantha*, into uninfested natural ecosystems.



A. gangetica ssp. *gangetica* has purple flowers. It is naturalised across parts of northern Australia. Photo: Colin G. Wilson

Early detection and eradication are also important to prevent infestations of *A. gangetica* ssp. *micrantha*. Small infestations can be easily eradicated if they are detected early but an ongoing commitment is needed to ensure new infestations do not establish.

The Alert List for Environmental Weeds

The Federal Government's *Alert List for Environmental Weeds* was declared in 2001. It consists of 28 weed species that currently have limited distributions but potentially could cause significant damage. The following weed species are therefore targeted for eradication:

Scientific name	Common name	Scientific name	Common name
<i>Acacia catechu</i> var. <i>sundra</i>	cutch tree	<i>Koelreuteria elegans</i>	Chinese rain tree
<i>Acacia karroo</i>	Karoo thorn	<i>Lachenalia reflexa</i>	yellow soldier
<i>Asystasia gangetica</i> ssp. <i>micrantha</i>	Chinese violet	<i>Lagarosiphon major</i>	lagarosiphon
<i>Barleria prionitis</i>	barleria	<i>Nassella charruana</i>	lobed needle grass
<i>Bassia scoparia</i>	kochia	<i>Nassella hyalina</i>	cane needle grass
<i>Calluna vulgaris</i>	heather	<i>Pelargonium alchemilloides</i>	garden geranium
<i>Chromolaena odorata</i>	Siam weed	<i>Pereskia aculeata</i>	leaf cactus
<i>Cynoglossum creticum</i>	blue hound's tongue	<i>Piptochaetium montevidense</i>	Uruguayan rice grass
<i>Cyperus teneristolon</i>	cyperus	<i>Praxelis clematidea</i>	praxelis
<i>Cytisus multiflorus</i>	white Spanish broom	<i>Retama raetam</i>	white weeping broom
<i>Dittrichia viscosa</i>	false yellowhead	<i>Senecio glastifolius</i>	holly leaved senecio
<i>Equisetum</i> spp.	horsetail species	<i>Thunbergia laurifolia</i>	laurel clock vine
<i>Gymnocoronis spilanthoides</i>	Senegal tea plant	<i>Tipuana tipu</i>	rosewood
<i>Hieracium aurantiacum</i>	orange hawkweed	<i>Trianoptiles solitaria</i>	subterranean cape sedge

Weed control contacts

State / Territory	Department	Phone	Email	Website
ACT	Environment ACT	(02) 6207 9777	EnvironmentACT@act.gov.au	www.environment.act.gov.au
NSW	NSW Agriculture	1800 680 244	weeds@agric.nsw.gov.au	www.agric.nsw.gov.au
NT	Dept of Infrastructure, Planning and Environment	(08) 8999 5511	weedinfo.ipe@nt.gov.au	www.nt.gov.au
Qld	Dept of Natural Resources and Mines	(07) 3896 3111	enquiries@nrm.qld.gov.au	www.nrm.qld.gov.au
SA	Dept of Water, Land and Biodiversity Conservation	(08) 8303 9500	apc@saugov.sa.gov.au	www.dwlbc.sa.gov.au
Tas	Dept of Primary Industries, Water and Environment	1300 368 550	Weeds.Enquiries@dpiwe.tas.gov.au	www.dpiwe.tas.gov.au
Vic	Dept of Primary Industries/Dept of Sustainability and Environment	136 186	customer.service@dpi.vic.gov.au	www.dpi.vic.gov.au www.dse.vic.gov.au
WA	Dept of Agriculture	(08) 9368 3333	enquiries@agric.wa.gov.au	www.agric.wa.gov.au

The above contacts can offer advice on weed control in your state or territory. If using herbicides always read the label and follow instructions carefully. Particular care should be taken when using herbicides near waterways because rainfall running off the land into waterways can carry herbicides with it. Permits from state or territory Environment Protection Authorities may be required if herbicides are to be sprayed on riverbanks.



Flowers, leaves, and ripe and unripe seed capsules of *A. gangetica* ssp. *micrantha*.
Photo: Graham Prichard, Port Stephens Council, NSW

Quarantine to prevent further introductions

The importation of either subspecies of *Asystasia gangetica* into Australia is not permitted because of the risk of further spread, and the potential introduction of new genetic diversity that could make future control more difficult.

Do not buy seeds via the internet or from mail order catalogues unless you check with quarantine first and can be sure that they are free of weeds like *Asystasia gangetica* ssp. *micrantha*.

Call 1800 803 006 or see the Australian Quarantine and Inspection Service (AQIS) import conditions database <www.aqis.gov.au/icon>. Also, take care when travelling overseas that you do not choose souvenirs made from or containing seeds, or bring back seeds attached to

hiking or camping equipment. Report any breaches of quarantine you see to AQIS.

Raising community awareness

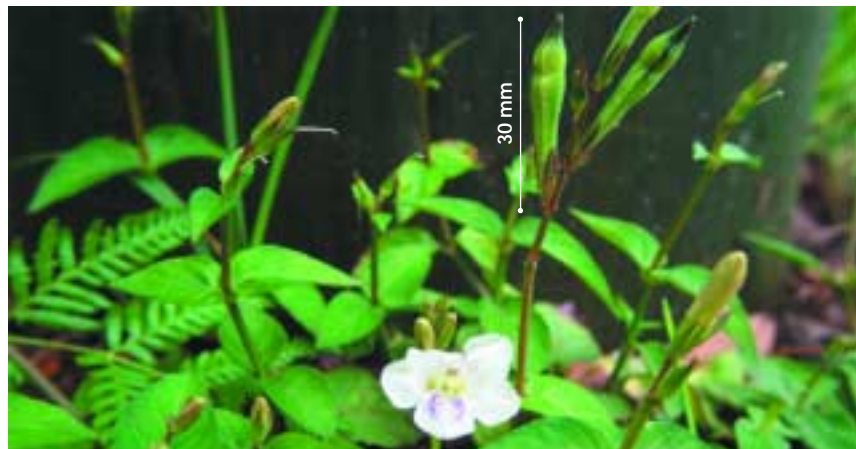
Some 65% of weeds, including *A. gangetica* ssp. *micrantha*, which have recently established in Australia have escaped from plantings in gardens and parks. The detrimental impacts of these weeds far outweigh any potential horticultural benefits. The public should be made more aware of these impacts, and other issues such as how to identify *A. gangetica* ssp. *micrantha* and what to do if they find it.

A. gangetica ssp. *micrantha* is easiest to identify when in flower. It has white flowers with two parallel purple lines

on raised ridges on its inside. The leaves and stems have scattered hairs, and hooks on the seeds are also distinctive.

New infestations of *A. gangetica* ssp. *micrantha*

Because there are relatively few *A. gangetica* ssp. *micrantha* infestations, and it can potentially be eradicated before it becomes established, any new outbreaks should be reported immediately to your state or territory weed management agency or local council. Do not try to control *A. gangetica* ssp. *micrantha* without their expert assistance. Control effort that is poorly performed or not followed up can actually help spread the weed and worsen the problem.



A. gangetica ssp. *micrantha* is one of many environmental weeds that have spread into bushland from initial plantings in gardens.

Photo: Graham Prichard, Port Stephens Council, NSW



Methods to control *A. gangetica* ssp. *micrantha*

Management of the soil seedbank is the key to control of established infestations of *A. gangetica* ssp. *micrantha*. This will involve persistent follow-up for several years in cooperation with your state or territory weed management agency or local council.

Hand weeding requires extreme care

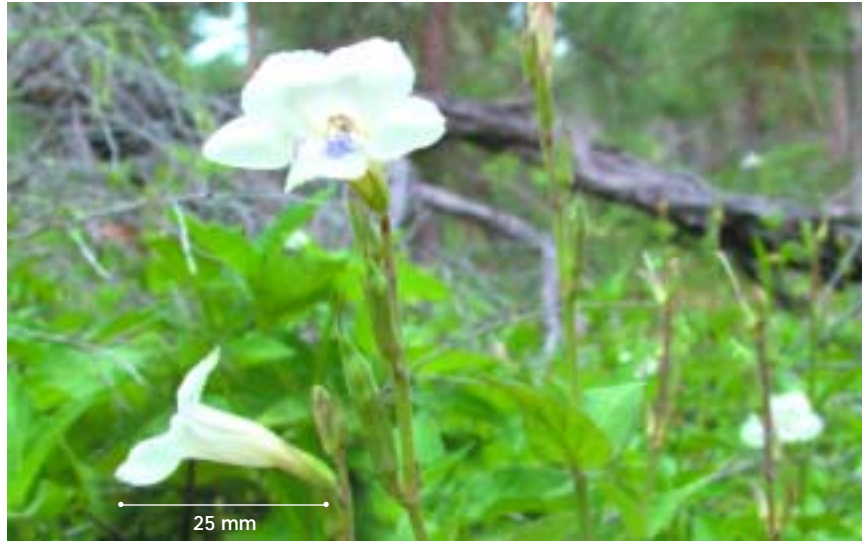
Stems of *A. gangetica* ssp. *micrantha* break up easily and the plant can propagate from cuttings, so unless done carefully, hand pulling can cause infestations to spread. Because plant material may contain seeds, it is important to bag all cuttings for disposal. Hand pulling seedlings and small plants is suited to small infestations with easy access.

Seek help in disposing of plants

Much of the spread of *A. gangetica* ssp. *micrantha* has been attributed to the incorrect disposal of plant parts. Extreme care must be taken when disposing of hand-pulled plants, especially if seeds are present. Seed may also be inadvertently moved in contaminated soil. The best disposal methods which will kill seeds cheaply and easily are still being investigated. Use a conservative approach and contact your local council or state/territory weed management agency for specific advice before attempting to dispose of *A. gangetica* ssp. *micrantha*.

Herbicides are being trialled for suitability

Maintaining groundcover and competitive desirable species is important, so get advice before spraying. Trials are being carried out by the NSW Department of Agriculture to identify suitable selective herbicides for *A. gangetica* ssp. *micrantha*. Work to date indicates that it is susceptible to a wide range of selective broadleaf herbicides (those that do not kill grasses).



Infestations smother other ground vegetation: Anna Bay, north of Newcastle, NSW.
Photo: Andrew Storrie, NSW Agriculture

Herbicides to control *A. gangetica* ssp. *micrantha* are registered for 'off-label' minor use through the permit system of the Australian Pesticides and Veterinary Medicines Authority (APVMA) <www.apvma.gov.au> until October 2008. For more information, contact the APVMA (by phone: (02) 6272 5852 or email: contact@apvma.gov.au), your local council weeds officer or state or territory weed management agency.

Other control options

Slashing prior to seed set may help control *A. gangetica* ssp. *micrantha*. However, equipment must be carefully cleaned to prevent further spread. Cultivation should be avoided due to the risk of spreading plant fragments.

The effect of fire on the soil seedbank is unknown and it is not being used as a strategy to manage existing infestations.

There are no known biological control agents in Australia for this species. Biological control is a slow process and is normally intended to control a weed rather than eradicate it.

Revegetation to prevent reinfestation

Competition from other vegetation can help suppress seedling germination.

Planting alternative indigenous groundcovers and avoiding bare ground wherever possible can help prevent *A. gangetica* ssp. *micrantha* taking hold.

Legislation

All subspecies of *Asystasia gangetica* have been added to the list of prohibited imports and can no longer be brought into Australia. Although *A. gangetica* ssp. *micrantha* is not declared as a noxious weed, it is marked for eradication by its inclusion on the *Alert List for Environmental Weeds*.

Acknowledgments

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Maps: Data used in the compilation of actual and potential distribution maps provided by Australian herbaria via Australia's Virtual Herbarium and Sainty and Associates P/L, respectively.



If you find a plant that may be *A. gangetica* ssp. *micrantha*

Quick reference guide

Identification

You will first need to confirm its identity. Contact your state or territory weed management agency for help in identifying the plant. You will need to take note of the characteristics of the plant in order to accurately describe it. Some important features of *A. gangetica* ssp. *micrantha* are:

- white bell-shaped flowers, 20–25 mm long, with purple stripes in two parallel lines on the inside

- club-shaped seed capsules
- opposite leaves with an oval, sometimes nearly triangular, shape and up to 165 mm long. The leaves and stems have scattered hairs.

Reporting occurrences

Once identified, new occurrences of *A. gangetica* ssp. *micrantha* should be reported to the relevant state or territory weed management agency or local council, who will offer advice and assistance on its control. Because *A. gangetica* ssp. *micrantha* represents such a serious environmental and

economic threat to Australia, its control should be undertaken with the appropriate expertise and adequate resources.

Follow-up work will be required

Once the initial infestation is controlled, follow-up monitoring and control will be required to ensure that reinfestation does not occur. Monitor treated areas monthly to detect and eradicate seedlings before they have a chance to produce seed.

Collecting specimens

State or territory herbaria can also identify plants from good specimens. These organisations can provide advice on how to collect and preserve specimens.

State/Territory	Postal Address	Phone	Web
Australian National Herbarium	GPO Box 1600 Canberra, ACT, 2601	(02) 6246 5108	www.anbg.gov.au/cpbr/herbarium/index.html
National Herbarium of New South Wales	Mrs Macquaries Rd Sydney, NSW, 2000	(02) 9231 8111	www.rbg Syd.nsw.gov.au
National Herbarium of Victoria	Private Bag 2000 Birdwood Avenue South Yarra, Vic, 3141	(03) 9252 2300	www.rbg.vic.gov.au/biodiversity/herbarium.html
Northern Territory Herbarium	PO Box 496 Palmerston, NT, 0831	(08) 8999 4516	http://www.nt.gov.au/ipe/pwcnt/
Queensland Herbarium	c/- Brisbane Botanic Gardens Mt Coot-tha Rd Toowong, Qld, 4066	(07) 3896 9326	www.env.qld.gov.au/environment/science/herbarium
South Australian Plant Biodiversity Centre	PO Box 2732 Kent Town, SA, 5071	(08) 8222 9311	www.flora.sa.gov.au/index.html
Tasmanian Herbarium	Private Bag 4 Hobart, Tas, 7000	(03) 6226 2635	www.tmag.tas.gov.au/Herbarium/Herbarium2.htm
Western Australian Herbarium	Locked Bag 104 Bentley DC, WA, 6983	(08) 9334 0500	http://science.calm.wa.gov.au/herbarium/

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