SAPIA NEWS

SOUTHERN AFRICAN PLANT INVADERS ATLAS

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ARC • LNR
Excellence in Research and Development

WORKING FOR WATER

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REPUBLIC OF SOUTH AFRICA

Inside this issue:

Editor and SAPIA co-ordinator:
Lesley Henderson
ARC-PPRI, Weeds Research Programme
c/o SANBI
Private Bag X101
Pretoria
0001
South Africa

e-mail: L.Henderson@sanbi.org.za
Tel: 012 843 5035
Fax: 012 804 3211
website:
www.agis.agric.za/wip

Articles and photos by Lesley Henderson unless otherwise acknowledged

Invasive Aroids

Plants belonging to the **Arum family (Araceae)** are commonly known as **aroids**. Aroids range from tiny floating aquatic plants to forest climbers. Many are cultivated for their ornamental flowers or foliage and others for their food value. Many have become invasive and this edition of SAPIA News highlights some species that are invasive or have the potential to become invasive in South Africa.

There is a **special alert by SANBI's Early Detection and Rapid Response (EDRR) programme to silver vine, *Epipremnum aureum*,** and an appeal is made to the public to report sightings of this vine growing outside of cultivation.

Window leaf, *Monstera deliciosa*, a climbing aroid that has escaped from gardens on the southern slopes of the Soutpansberg range in Limpopo Province.
Photo: H G Zimmermann.

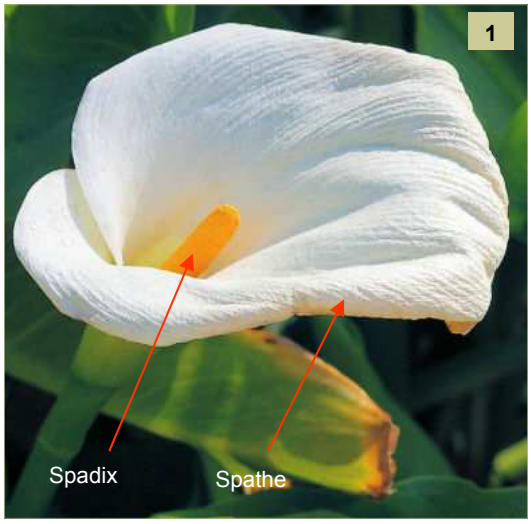
The Weeds and Invasive Plants website: www.agis.agric.za/wip is currently not being managed due to ongoing operational problems at AGIS.

Requests for information from the SAPIA database and submission of records of invasive plants should be sent directly to Lesley Henderson at L.Henderson@sanbi.org.za.

SAPIA newsletters are posted at the ARC website: www.arc.agric.za under 'News Articles'.

Invasive Aroids

The family Araceae occurs mainly in the tropics but extends to subtropical and temperate zones. Plants are perennial, herbaceous or slightly woody. Many tropical aroids are climbers with aerial roots. Characteristically the aroids have an unusual type of spike-like inflorescence called a spadix which is usually surrounded by a leaf-like bract called a spathe. The fruit is usually a berry or sometimes a dry capsule. Many species reproduce vegetatively from plant fragments.



In South Africa, the most well-known indigenous ornamental aroids are the arum lilies or *Zantedeschia* species. The white arum lily, *Z. aethiopica* (**photo 1**), while prized in South Africa, has become an unwelcome invader of streams and moist sites in Australia and New Zealand.

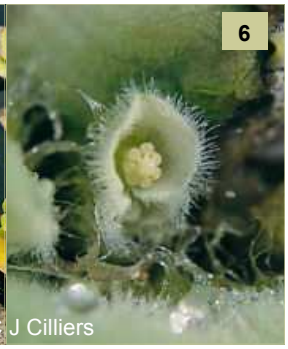
Many aroids have been introduced into South Africa for ornamental purposes. Popular plants include those belonging to the genera *Anthurium, Dieffenbachia*, *Monstera, Philodendron* and *Syngonium.*

Arrowhead vine or goosefoot plant, *Syngonium podophyllum* (**photo 2**), is an evergreen, woody-stemmed epiphyte with milky sap. The stems are loose and climbing when young but cling to trees when adult. Leaves are green, sometimes with cream, white, yellow or pink markings; leaf blade of juvenile plant 70–140 mm long, heart-shaped, of pre-adult arrow-shaped; adult leaf with stalk 150–600 mm long and blade deeply lobed into (5–)7–9 glossy leaflets to 300 mm long. Flowers are greenish-white, clustered on a column to 90 mm long within a fleshy spathe. Fruits are berries, enclosed in a red fruiting spathe (**photo 3**). Cultivated for ornament. Invades forest and moist shaded sites. Originally from Mexico, Central & South America and West Indies. Proposed category 1 invader under NEMBA.

Aroids contain crystals of calcium oxalate and toxic proteins which can cause intense irritation of the skin and mucous membranes and poisoning if the raw plant tissue is eaten.

Elephant's ears, taro or madumbe, *Colocasia esculenta* (**photo 4**), is a perennial herb up to 1.5 m high. Thick shoots arise from a large underground corm and it spreads horizontally by slender stolons. Leaves are dark green and velvety above, heart- to arrowhead-shaped, peltate (stalked from back of blade); blades up to 600 mm long x 500 mm wide; petioles up to 1 m long or more. Cultivated for its edible root and for ornament. Invades rivers and streams. Probably of tropical Asian origin. Whole plant is poisonous when uncooked.

Water lettuce, *Pistia stratiotes* (**photo 5**), is a perennial, mat-forming, usually free-floating aquatic plant, seldom exceeding 150–200 mm in diameter. Plants consist of a rosette of leaves with a tuft of long, fibrous roots beneath, resembling floating lettuces. Leaves are pale yellow-green, ribbed, with many longitudinal veins radiating from the base, softly hairy on both surfaces. Flowers are pale green or white, inconspicuous, situated in the plant centre (**photo 6**). Fruits are small capsules. Cultivated as an ornamental pond plant. Invades rivers, dams, pans. Originally from South America. Biological control is very effective using a leaf-feeding, leaf-mining weevil (see page 5). Prohibited plant (declared invader category 1 under CARA).



Silver vine.....watch out for a new potential weed on the southcoast of KwaZulu-Natal

Jabu Sithole & Sindi Nzama, SANBI, EDRR Programme

Species in the Araceae family are often attractive and therefore used as ornamentals. Silver vine, also known as golden pothos or devil's ivy, *Epipremnum aureum*, is a climber in this family with big leathery leaves that are green with white or yellow markings. The young leaves are undivided and heart-shaped (**photo 1a**), becoming divided (pinnatifid) as they mature, and the number of pinnate lobes increases with the age of a leaf (**photos 1b & 1c**).


1a


1b


1c

Silver vine is cultivated as both a house and garden plant because of its hardiness. It is able to grow in shade and requires low maintenance. It is native to southeast Asia but has spread widely to several areas such as the Pacific Islands and Australia. It is highly invasive in tropical areas and hence poses an invasion threat in South Africa's subtropical coastal areas. It has been recently noted invading forest margins in the Port Edward area.


2a


2b


3

This aroid climber uses its aerial roots (**photos 2a & 2b**) to climb up trees which it outshades with its big leaves (**photo 3**). Its trailing stems develop new plants and where these touch the ground they form creepers which smother the forest floor vegetation.

Silver vine and similar climbers

Climbers in the Araceae family mainly reproduce vegetatively from stem fragments or cuttings though some produce flowers. Improper disposal of garden refuse contributes to their invasion in the wild. Arrowhead vine, *Syngonium podophyllum*, is one example of an aroid climber that is already widespread in the country and is invasive in other countries. The table below depicts how silver vine differs from other climbers in the Araceae family that are common in KwaZulu-Natal.

Silver vine, golden pothos or devil's ivy *Epipremnum aureum*	**Arrowhead vine, goosefoot** *Syngonium podophyllum*	**Sweetheart plant, heart-leaf philodendron** *Philodendron hederaceum = P. scandens*	**Window leaf, cut-leaf philodendron** *Monstera deliciosa*
Young leaves undivided and heart-shaped	Young leaves undivided and heart-/oblong-/ovate-/triangular-/arrow-shaped	Young leaves undivided and heart-shaped	Young leaves undivided and heart-shaped
Mature leaves divided (pinnatifid: lobes do not reach the midrib)	Mature leaves very deeply divided with 5 to 11 leaflets	Mature leaves undivided	Mature leaves divided and with holes (hence common name of window leaf)
Leaves <20–100 cm long and up to 45 cm wide	Leaves ± 30 cm long and 10 cm wide	Leaves ± 30 cm long and 10 cm wide	Leaves ± 25–90 cm long and 25–75 cm wide
Leaf colour green with white or yellow markings	Leaf colour varies from green/whitish/yellowish (depending on variety)	Leaf colour green and initially velvety	Leaf colour green
Potentially invasive	Invasive and proposed category 1 on the draft list for NEMBA 2004	Recorded in the wild at Port Edward	Invasive in other countries and potentially invasive in South Africa




Silver vine is commonly cultivated in Durban gardens and is likely to become another serious invasive problem once it escapes into the wild. In certain areas such as Beachwood and Westville, it is already realizing its potential of becoming invasive.

The Early Detection and Rapid Response (EDRR) Programme would like to alert you to this new threat and requests all members of the public to report localities of silver vine invasion in the wild for verification. This species is not yet recognized as an invader in South Africa and is not listed on the draft invasive alien species lists, nor has it been much studied here.

Please assist the EDRR programme by reporting sightings of silver vine (*Epipremnum aureum*) to:
Jabu Sithole at 031 201 9190 or h.sithole@sanbi.org.za with a copy to alienplants@sanbi.org.za

SANBI Biodiversity for Life
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Department:
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REPUBLIC OF SOUTH AFRICA
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ARC-PPRI, WEEDS RESEARCH PROGRAMME

ARC-Plant Protection Research Institute

Weeds Research Programme
Private Bag X134
Queenswood
0121
South Africa

Phone: +27 (0)12 356 9840
Fax: +27 (0)12 356 9852

Contact: Acting Programme Manager:
Dr Roger Price
e-mail: PriceR@arc.agric.za

General enquiries: Mrs Hildegard Klein
e-mail: KleinH@arc.agric.za

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The Weeds Research Programme of the ARC-Plant Protection Research Institute is responsible for research on the ecology and control of invasive alien plants in South Africa. These plants were introduced either intentionally (e.g. for ornamental use or agroforestry purposes), or accidentally (e.g. in livestock feed) and now threaten biodiversity and agriculture. In addition, they reduce run-off from water catchments, thus diminishing flow in streams, and adversely affect the quality of life of communities.

- Biological control
- Chemical control
- Bioherbicides
- Integrated control

We are on the Web:

www.arc.agric.za

Quick link:

Invasive alien plants

see Plant Protection News

for current news from the Weeds Research Programme

News from the Weeds Research Programme:

- Release of the semi-aquatic grasshopper *Cornops aquaticum* for the biological control of water hyacinth (PPRI News 89 p. 14)
- New series of fact sheets on invasive alien plants and their biocontrol agents, compiled by Lin Besaans, and funded by the Working for Water Programme. All fact sheets are available at the ARC website, www.arc.agric.za, under Quick links.

Biological control of invasive plants

Water lettuce (*Pistia stratiotes*) before and under biocontrol with the weevil *Neohydronomus affinis* (Curculionidae)
Photos: C.J. Cilliers

Biological weed control is the use of natural enemies to reduce the vigour or reproductive potential of an invasive alien plant. The principle is that plants often become invasive when they are introduced to a new region without any of their natural enemies. The alien plants therefore gain a competitive advantage over the indigenous vegetation, because all indigenous plants have their own natural enemies that feed on them or cause them to develop diseases. Biological control is an attempt to introduce the alien plant's natural enemies to its new habitat, with the assumption that these natural enemies will remove the plant's competitive advantage until its vigour is reduced to a level comparable to that of the natural vegetation. Natural enemies that are used for biological control are called biocontrol agents.

The potential risk posed by a candidate biocontrol agent is determined by biocontrol researchers through extensive host range studies (specificity tests) that are carried out in a quarantine facility. These trials determine the range of plants that a potential biocontrol agent is able to use as host plants throughout its life cycle, as well as its host plant preferences. Permission to release a biocontrol agent will be sought only if the host-specificity tests prove without doubt that the potential agent is sufficiently host-specific for release in this country. To be regarded as sufficiently host-specific, the candidate agent must be either monophagous (i.e. the insect feeds on only one plant species, the target weed in this case) or it could have a slightly wider host range, provided that none of the additional host plants occur in South Africa or surrounding countries, either as indigenous or introduced crop plants.

South Africa is regarded as one of the world leaders in the field of biological control of invasive alien plants. Since the 1930s we have brought 29 invasive alien plant species under complete or substantial biological control. In the process, 111 species or biotypes of natural enemies were released, 85 of which became established. Remarkable successes have been achieved with either controlling or reducing the invasive potential of many invasive plants including cacti, aquatic weeds, Australian wattles, chromolaena and lantana. Seed feeders feature strongly in many of our projects. Tested and safe biocontrol agents are distributed in cooperation with the *Working for Water* Programme of the Department of Water Affairs.