



SAPIA NEWS

SOUTHERN AFRICAN PLANT INVADERS ATLAS

Newsletter of the Southern African Plant Invaders Atlas, an initiative of the Weeds Research Division, Agricultural Research Council, Plant Health and Protection (ARC-PHP)

A guide to the varieties of small round-leaved prickly pear

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Searches for potential biological control agents for small round-leaved prickly pear, *Opuntia engelmannii*, have been complicated by the many varieties of this species in its native Southern USA and matching them with the varieties in South Africa. See pages 2–4 for a guide to the identification of five varieties in South Africa and a sixth variety in Kenya, East Africa.

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ARC website: www.arc.agric.za and
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invasives.co.za

SANBI BID projects

The South African National Biodiversity Institute (SANBI), Biological Invasions Directorate (BID) has the mandate to coordinate and implement programmes for the prevention, control or eradication of listed invasive species.

This edition of SAPIA News puts the spotlight on a very successful programme which has almost reached its goal of extermination of the invasive bur cactus (*Opuntia salmiana*).

Prevention is better than cure—and SANBI BID is appealing to the public to report any sightings of the red-flowered, ivy-leaf morning glory (*Ipomoea hederifolia*).



Photo: Moleseng Moshobane

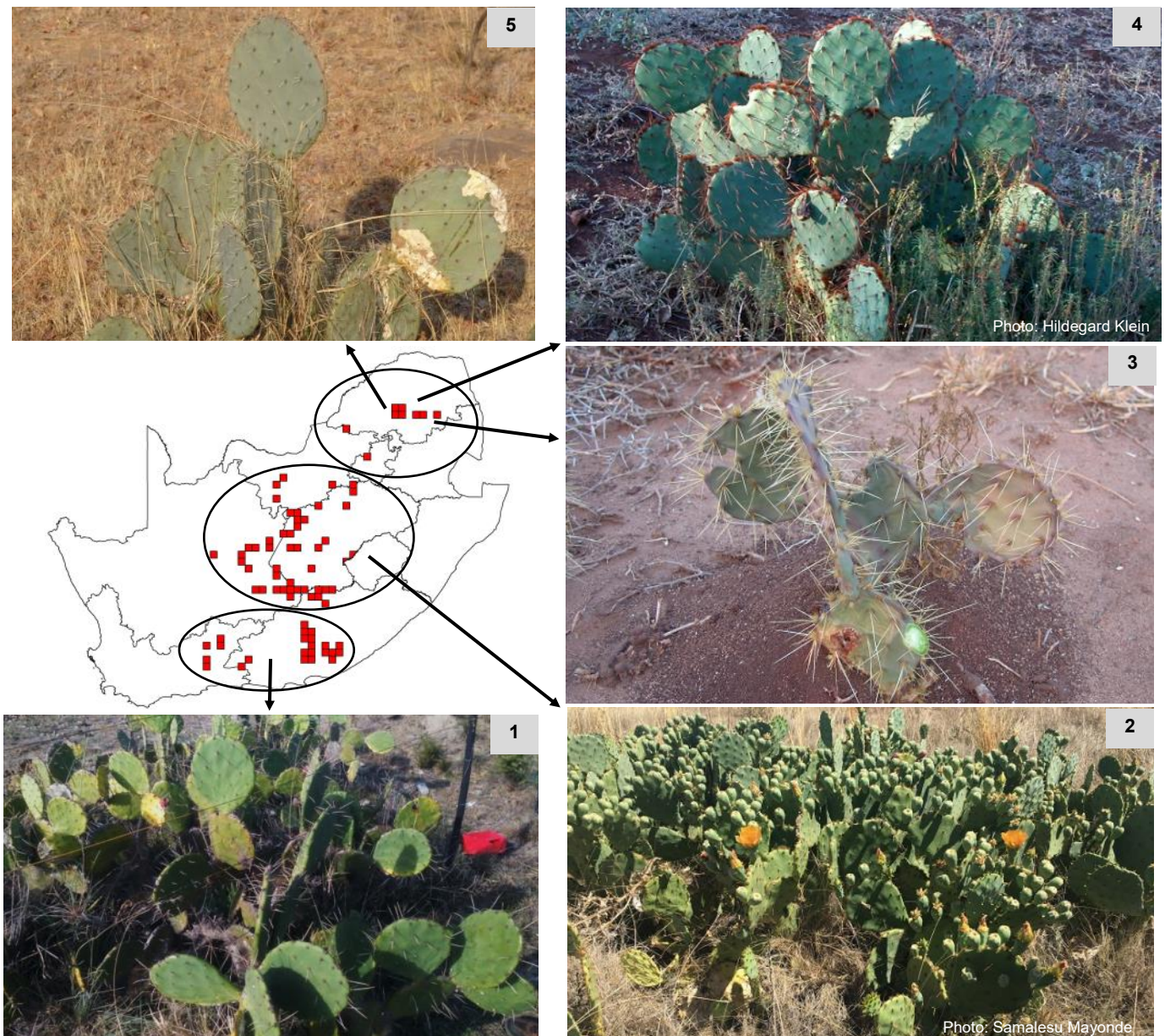
Small round-leaved prickly pear (*Opuntia engelmannii*): a guide to the varieties in South Africa and Kenya

Nic Venter, University of the Witwatersrand, email: nic.venter@wits.ac.za

The small round-leaved prickly pear (*Opuntia engelmannii*), native to North America, is an invasive cactus that has long been recorded in South Africa, with populations also occurring in Kenya and undoubtedly elsewhere in Africa. It was declared an invader in South Africa in 1984 under the name of *Opuntia lindheimeri* which is currently regarded as one of the varieties of *Opuntia engelmannii*. Unlike other invasive cactus species, which are for the most part well defined species, *O. engelmannii* consists of different forms or varieties.

Despite a more broad description as a result of these different forms, the different *O. engelmannii* varieties do share some general traits. Plants usually grow upright, attaining a height of about one metre but can grow taller depending on environmental conditions. The cladodes are round to broadly egg-shaped, there are usually 1 to 5 or more spines per areole, and there are typically few glochids on the sides but they can become more numerous on the upper edges.

Based on these descriptions, there appears to be five varieties in South Africa. For simplicity, the varieties are named according to where they are most abundant (see map). There is the **Eastern Cape variety** (photo 1), the **Northern Cape/Free State variety** (photo 2) and three varieties in Limpopo province i.e., **Limpopo yellow-spine** (photo 3), **Limpopo red-spine** (photo 4) and **Limpopo white-spine** (photo 5). When identifying these *O. engelmannii* varieties, the spines and glochids tend to be the most useful characteristics. It should be noted that there can be substantial variability among different populations of the same variety, but the descriptions should suffice under most circumstances (see pages 3 and 4).

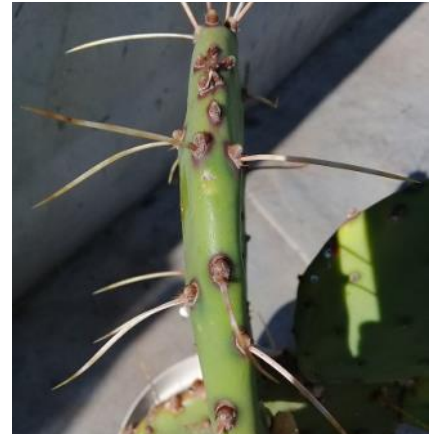


Small round-leaved prickly pear (*Opuntia engelmannii*): a guide to varieties in South Africa and Kenya

Eastern Cape variety:

Most areoles are spineless, but when present there is usually one long partially twisted off-white spine, accompanied by a shorter spine.

The brown glochids are not very prominent.



Northern Cape/Free State variety:

Up to five downward facing spines, red/brown, fading in colour towards the tips.

Numerous long red/brown glochids, which feature conspicuously on the upper edges of the cladodes.

This variety is presently being attacked by cochineal previously released on a different cactus weed, and they appear to be suppressing the cactus at certain sites.



Limpopo red-spine variety:

Very similar to the Northern Cape/Free State variety.

Brown/red spines fading in colour towards the tip, with numerous long brown/red glochids. However, there appears to be more, and longer spines associated with each areole.

This variety is presently being attacked by cochineal previously released on a different cactus weed, and they appear to be suppressing the cactus at certain sites.



Photo: Hildegard Klein

Limpopo white-spine variety:

Multiple spines on the edges of the cladodes but typically three cream to white spines, mostly arranged as a crow's foot pattern on the sides of the cladodes.

Glochids are pale in colour.



Small round-leaved prickly pear (*Opuntia engelmannii*): a guide to varieties in South Africa and Kenya

Limpopo yellow-spine variety:

Up to five, but typically three long thin yellow spines.

Numerous yellow glochids on the upper edges of the cladodes.



Kenyan variety:

In addition to the five *Opuntia engelmannii* varieties found in South Africa, a sixth variety has established in Laikipia County in Northern Kenya.

The Kenyan variety is similar to the Limpopo yellow-spine variety, except that the spines are long, mostly downward facing, and importantly most of the spines have a red/brown colouration within the first few millimetres of the base.

Yellow glochids are numerous on the upper edges of the cladodes.



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Research funded by CABI in collaboration with Wits University and Rhodes University is currently underway to find a cochineal biocontrol agent for the Kenyan variety (photo 6).



Photo: Arne Witt

In its native North American range, taxonomists argue as to whether these are different forms of *O. engelmannii*, or entirely different species. Owing to this uncertainty regarding the real identity of these tentative forms of *O. engelmannii*, research is underway at the University of Witwatersrand in collaboration with Rhodes University to resolve the relatedness of these invasive cacti. Additionally, by analysing genetic samples collected from the native range of *O. engelmannii* in the USA and comparing these to the South African varieties, it is hoped that the origin of our *O. engelmannii* varieties in South Africa can be determined. This is important as it can guide researchers as to where future surveys should be conducted to find new biocontrol agents. Nevertheless, research is currently underway at the ARC-PHP, Wits University and Rhodes University to test new cochineal populations (biotypes) imported from the USA as potential biocontrol agents for our different *O. engelmannii* varieties.

An innovative approach to achieve extirpation of bur cactus (*Opuntia salmiana*) in South Africa

Nkhangweleni Sikhauli, Biological Invasions Directorate, South African National Biodiversity Institute

Description

Opuntia salmiana, commonly known as bur cactus, is a small cactus growing up to 1m tall or taller if supported by trees and shrubs. It has long, often sprawling cylindrical stems that are about 1 cm in diameter. Its stems and fruits are armed with thin barbed spines. Flowers are large and mainly white, seldom pale yellow (**photo 1**). Its fruits are bright red and oblong, with several small and very spiny segments at their tips (**photo 2**). *Opuntia salmiana* can be distinguished from *Opuntia aurantiaca* (jointed cactus) and *Opuntia pubescens* (velvet bur cactus) by its bristle-like spines and rounded stems that do not detach as easily.

Why is it a problem?

Opuntia salmiana is an invasive alien cactus native to South America, Bolivia, Paraguay and Argentina. This species is listed as category 1a under the National Environmental Management: Biodiversity Act 10/2004 (NEM:BA) regulations (2016 amendments). Species listed under category 1a must be controlled with the aim of eradication. If left unattended, *Opuntia salmiana* could become a serious problem in the dry areas of South Africa (North West, Northern Cape, Gauteng and Limpopo provinces). The species out-competes native species and may eventually invade other areas. The spiny segments are also injurious to animals and humans. Its terminal branches and the fruits are easily detached and can stick to passing animals, and they can easily spread by running water. These joints are armed with many small bristle-like barbed spines which attach easily to fur, clothes or skin and can be dispersed over long distances. Each small joint is 3–7 cm long and the fruit can root and grow into new plants. Currently, in South Africa, the species is only known to occur at Wagpos farm, near Brits in North West province (**photos 3 & 4**) and at the Agricultural Research Council (ARC) experimental farm in Brits, North West Province.

The Biological Invasions Directorate, in partnership with the Department of Agriculture-Land Use and Soil Management, surveyed and mapped plants at both the Wagpos farm and the ARC experimental station. It was discovered that *Opuntia salmiana* had infested two areas inside the Wagpos farm of not more than 5ha. Isolated plants were found to occur on the ARC experimental farm.



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Bur cactus (*Opuntia salmiana*) continued

We assume that *Opuntia salmiana*, like many other South American cacti, was introduced as an ornamental. The initial chemical clearing of this species commenced in the beginning of January 2013. Subsequently, a follow-up treatment was conducted in January 2014. Upon monitoring and evaluating the treated sites, it became evident that the tall grass cover impaired the efficacy of the control operation as many young plants were hidden in the tall grass.

Local community members were involved to physically detect and collect all plants which had been overlooked (**photos 5 & 6**). This novel approach enabled us to reduce the population to an absolute minimal level.

Opuntia salmiana poses a significant threat to human livelihood and agricultural production. The SANBI's Biological Invasions Directorate is presently managing the only known populations of *Opuntia salmiana* with the aim of total eradication.



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6

Volunteer collecting bur cactus

References

- Cindi DD & Jaca T.P. (2016) First record of *Opuntia pubescens* HL Wendland ex Pfeiffer, 1835 Naturalised in South Africa. *BioInvasions Record* 5 (4): 213–215.
- Walters M, Figueiredo E, Coruch NR, Winter, PJD, Smith GF, Zimmermann HG, Mashope, Bk. (2011) Naturalised and invasive succulents of South America. *Abc Taxa* 11:193–195

What you can do to help us manage this species

Please provide us with the following information:

- The locality – supply any landmarks or GPS information to locate the plants
- Photos of the plants
- An estimated size or number of plants found on a particular site

Sightings can be reported to:

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Senior Technician
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Have you seen the ivy-leaf morning glory (*Ipomoea hederifolia*)?

MC Moshobane & MT Mundalamo, Biological Invasions Directorate,
South African National Biodiversity Institute

Background information

Ipomoea hederifolia L. (Convolvulaceae), commonly known as the cardinal's flower, ivy-leaf morning glory, or scarlet creeper, is a branched slender and twining vine native to tropical America (photos 1 & 2). The flowers are red with long, narrow corolla tubes. Leaves are ovate to circular in outline with heart-shaped bases. Fruits are spherical capsules. Seeds are black and densely hairy. It is found naturalized in several countries including Australia, Christmas Island Fiji, Nauru, Hawaii, Palau, New Caledonia, Tanzania, Kenya and Uganda. In Queensland it is regarded as a potential invader.

Known records in South Africa

In South Africa it has been detected mostly in **KwaZulu-Natal** province in the following areas: Umhlanga; Ballito; Durban: Westville suburb and near the Portuguese Club; Pinetown: Belvedere Woods, Cowies Hill; Umkomaas: Empisini Nature Reserve, and **Limpopo province** at the Thohoyandou landfill site.

References

https://keyserver.lucidcentral.org/weeds/data/media/Html/ipomoea_hederifolia.htm
[Accessed 14 August 2019]

Mary Firrell, 2018. *Ipomoea* species - Importation implications. Horticulture and Forestry Sciences, Department of Agriculture and Fisheries, State of Queensland. Australia.

GBIF.org (14 August 2019) GBIF Occurrence Download <https://doi.org/10.15468/dl.jzc5r4>

Witt, A., Luke, Q., 2017. *Guide to the naturalized and invasive plants of Eastern Africa*, [ed. by Witt, A., Luke, Q.]. Wallingford, UK: CABI. vi + 601 pp.
<http://www.cabi.org/cabebooks/ebook/20173158959>
doi:10.1079/9781786392145.0000

Verdcourt, B., 1963. *Flora of Tropical East Africa: Convolvulaceae*. East African Herbarium and Royal Botanic Gardens, Kew.



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How can you assist?

Please report sightings of these plants to Claude Moshobane, Tel 078 516 8933 and e-mail: m.moshobane@sanbi.org.za.

If possible, provide a locality description, photo, and GPS co-ordinates.



ARC-PHP, WEEDS RESEARCH DIVISION



The Weeds Research Division of the ARC-Plant Health and Protection (PHP) is responsible for research on the ecology and control of invasive alien plants in South Africa.

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