



Newsletter of the Southern African Plant Invaders Atlas, an initiative of the Weeds Research Division of Plant Protection Research, an institute within the Agricultural Research Council (ARC)

Garden Route: invasive alien hotspot

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The devastating fires along the Garden Route in June were exacerbated by the massive fuel load contained within extensive stands of both commercial plantations and uncontrolled stands of invasive alien woody plants. The Garden Route, extending from Sedgefield to Knysna and Plettenberg Bay is one of the invasive alien plant hotspots in South Africa with 123 species documented in the SAPIA database. Of these species, 93 are listed under the National Environmental Management: Biodiversity Act (NEM:BA), and ought to be controlled. The most invasive species, forming extensive stands, are several species of acacia, pines, eucalypts and hakea.



The June 2017 Garden Route fires were caused by a combination of factors: drought conditions, extreme winds, high temperatures and a high fuel load. The massive fires and threat posed by invasive alien plants were predicted by Richard Cowling and co-authors in *Veld & Flora*, September 2009, 'How no-man's-land is now everyone's problem'. The scenario of water shortages, abnormal fires and soil erosion, loss of tourism and economic activity were predicted to occur as a result of society failing to plan for, and to deal with, the threat of invasive alien plants

Chinese hollygrape (*Mahonia oiwakensis*): newly detected weed

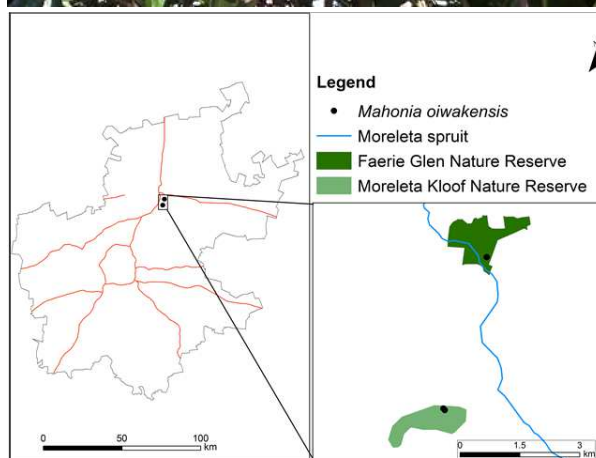
Thulisile P. Jaca, Directorate: Biological Invasions (DBI), South African National Biodiversity Institute (SANBI), Pretoria

History: Chinese hollygrape (*Mahonia oiwakensis* (= *M. lomariifolia*)) is a member of the Berberidaceae family and is native to China and Taiwan (Arendt 1961; Wu Zheng-vi *et al* 1994). It is a shrub or small tree with bright yellow flowers that can be observed from autumn to spring in South Africa (photo 1).

Plants have been detected in two Gauteng municipal nature reserves, Faerie Glen and Moreleta Kloof Nature Reserves (see map), in two vegetation types, the Gauteng shale mountain bushveld and Marikana thornveld (photo 2 & 3). The first plant was spotted at the Faerie Glen Nature Reserve, Pretoria in May 2015 by Louise Kritzinger, Chairwoman of the Friends of Faerie Glen Nature Reserve, but could not be positively identified as the plant was not in flower. Further plants were spotted at the Moreleta Kloof during a routine alien vegetation survey in October 2016. In May 2017 plants in both localities were in full flower and were positively identified as *Mahonia oiwakensis*. Surveys in the surrounding areas revealed that this species is sold in nurseries as a garden ornamental and that garden plants are the likely source of the naturalised populations.

Chinese hollygrape is a popular garden plant in some countries such as New Zealand and is listed (as *M. lomariifolia*) either as an environmental weed, invasive, naturalised or casual alien throughout the world (Randall 2017). In South Africa *M. oiwakensis* is the first *Mahonia* species to be detected as naturalised; however, some species in the Berberidaceae family such as *Berberis aristata* and *B. julianae* are already naturalised, and have the potential to be invasive, therefore Keet *et al.* (2016) recommended that these species should be classified as category 1a invasive species under the National Environmental Management: Biodiversity Act.

The problem: Members of the genus *Mahonia* can be aggressive invaders such as the well-known *M. aquifolium*, which is invasive in Germany (Auge & Brandl 1997) and *M. bealei*, which has been planted as an ornamental and now invades woodlands in the southern United States (Swearingen & Barger 2016). *M. oiwakensis* produces a massive number of seeds which pose a potential threat if they are viable. Some species are reported to reproduce both vegetatively and by seeds, but it is not yet known if this is the case with *M. oiwakensis*.



Chinese hollygrape (*Mahonia oiwakensis*): newly detected weed

How to recognise it: Chinese hollygrape is an evergreen shrub or small tree up to 5 m tall. Leaves are dark green above and yellowish green below, compound, up to 65 cm long, with 11–15 pairs of leaflets plus one terminal leaflet. The inflorescence is a 5–27-fascicled raceme up to 25 cm long (**photo 4**). The flowers are golden yellow with three whorls of sepals and one whorl of petals. Flowers are seen from May to September in South Africa. Fruits are berries, ranging from blue to bluish black or purple black in colour, conical-ovoid in shape (**photo 5**) and can be seen in early summer.



Future plans: The Directorate on Biological Invasions in SANBI will conduct extensive surveys to establish the extent of the outlier infestations of this species. Research on the potential invasiveness of the species in South Africa and a detailed awareness programme is being planned.

References

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- Swearingen, J. & Barger, C. 2016. Leatherleaf mahonia, *Mahonia bealei* (Fortune) Carr. Invasive Plant Atlas of the United States. University of Georgia Center for Invasive Species and Ecosystem Health. <http://www.invasiveplantatlas.org/>
- Wu Zheng-yi & P. H. Raven et al., eds. 1994. *Flora of China* Vol. 19 (English edition).

How can you assist?

Please report sightings of *Mahonia oiwakensis* to SANBI-DBI. Please provide us with a locality, GPS co-ordinates and photos. A staff member from the DBI will be in contact and likely visit the population to verify the sighting.

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Coral cactus (Afr: wolkactus) (*Austrocyllindropuntia vestita*): first record in the Eastern Cape, South Africa

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Description: Coral cactus (*Austrocyllindropuntia vestita*) is a small to medium-sized columnar cactus (**photo 1**). The stem is cylindrical, up to 3 cm in diameter, covered densely with long white hairs, branched basally and near the top. It has thin leaves and few white, thin spines up to 1 cm long. The flowers develop at the top of the stem, bright orange- to pinkish-red in color and up to 2.5 cm in diameter.

First detection in South Africa: Two species of the genus *Austrocyllindropuntia* are recorded as naturalised in South Africa: *A. cylindrica* and *A. subulata*. A third species, *A. vestita*, was recorded growing outside of cultivation in February 2016 in the Little Karoo in the Western Cape (Smith & Figueiredo 2016). All three species are originally from Argentina and Bolivia, and both *A. cylindrica* and *A. subulata* are recorded as naturalised in other countries, including Australia.

First record in the Eastern Cape: A small population of coral cactus has been detected and recorded in the Eastern Cape, at Aberdeen (May 2017) (**photo 2**), by DBI Eastern Cape team members. A herbarium specimen was sent to the Kwa-Zulu Natal SANBI herbarium, where the species was positively identified.



It is unclear how and when the species was introduced into South Africa, but like other cacti it was probably introduced through the ornamental trade and populations growing outside of cultivation have probably emanated from garden plants. Like other cacti this species may pose a significant threat to biodiversity, agriculture and human livelihoods. It is currently not listed as an invasive species under the National Environmental Management Biodiversity Act 2004 (Act No. 10 of 2004). SANBI's DBI unit is assessing the invasive status of this species, so that remedial action is taken before it spreads and becomes invasive.

Reference

Smith, G.F. & Figueiredo, E. 2016. *Austrocyllindropuntia vestita* (Salm-Dyck) Backeb. (Cactaceae) recorded from the Little Karoo in South Africa's Western Cape Province. *Bradleya* **34**: 55–58.



What can you do to help?:

Please report sightings of these plants to SANBI-DBI. Please provide us with a locality, GPS co-ordinates and photos. A staff member from the DBI will be in contact and likely visit the population to verify the sighting. It will then be included in the management plan.

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More newly recorded weeds in the SAPIA database

Elephant's foot or tobacco weed (*Elephantopus mollis*) (photo 1) is a coarse perennial herb belonging to the family Asteraceae, and is indigenous to tropical America. It has become invasive in high rainfall situations in many parts of the world, including much of tropical Africa. It was recently recorded from Ongoye Forest in KwaZulu-Natal by Richard Boon. Dense masses of broad-leaved seedlings can smother crops, pastures and indigenous vegetation. In Queensland, Australia, it is a major threat to the beef and dairy industries.



Photos: Richard Boon

Himalayan knotweed (*Persicaria wallichii*) (photo 2) is an ornamental shrub belonging to the family Polygonaceae, and is indigenous to temperate western Asia. It was recently recorded as an escape from cultivation in the Bushman's Nek area of KwaZulu-Natal. Michael Cheek of SANBI confirmed that the unidentified knotweed plants near Mooi River, dating back to 2005, are the same species. It has become invasive in other parts of the world and can form dense stands which displace indigenous species.



Photos: Michael Cheek

Bracelet honey myrtle (*Melaleuca armillaris*) (photo 3) is a large shrub or small tree belonging to the family Myrtaceae, and is indigenous to south-eastern Australia. It has been widely cultivated in South Africa and has been recorded as naturalised near Cape Town by SANBI DBI W Cape. This species has become a serious environmental weed in Australia outside of its native range. It is a threat to the fynbos of the W Cape as it has the potential to replace indigenous species and also increases fuel loads in invaded areas making them more prone to fire.



Photos: Pieter Winter

Bridal bouquet (*Poranopsis paniculata*) (photo 4) is a vigorous climber belonging to the family Convolvulaceae, and is indigenous to temperate and tropical Asia. It has been recorded by Michael Cheek of SANBI in the Durban area. This species is naturalised in Hawaii and Florida in the USA. Its rampant growth enables it to climb into the canopies of trees and to smother them. Plants spread by seed and vegetatively by stems that are able to root at the nodes.



Forest & Kim Starr, Wikimedia Commons, CC BY 3.0

Scott Zona, Wikimedia Commons, CC BY 2.0

Naturalized alien flora of the world

The first comprehensive description of alien flora of the world Petr Pyšek, Institute of Botany, The Czech Academy of Sciences

Six years of effort of an international team of botanists and plant ecologists from the Czech Republic, Germany, Austria and United Kingdom, complemented with a broad range of collaborators from 19 countries all over the world, resulted in the first comprehensive publication on the global alien and invasive flora. The group of authors led by Petr Pyšek from the Institute of Botany in Průhonice, The Czech Academy of Sciences, and Faculty of Science, Charles University in Prague describe patterns in diversity and geographic distribution of naturalized and invasive plant species, taxonomic, phylogenetic and life-history structure of the global naturalized flora as well as levels of naturalization and their determinants. The study published in *Preslia*, the journal of the Czech Botanical Society, is based on the recently built Global Naturalized Alien Flora (GloNAF) database, containing data on the distribution of naturalized alien plants in 482 mainland and 362 island regions of the world.

The regions with the greatest percentages of naturalized alien plants in their floras, representing the main hotspots of global plant naturalization, appear on both the eastern and western coasts of North America (where California with 1,753 naturalized plant species is the world's richest region), in north-western Europe, South Africa, south-eastern Australia, New Zealand, and India, the main global hotspot for island invasions is in the Pacific. South Africa, India, California, Cuba, Florida, Queensland and Japan have the highest numbers of invasive species, i.e. those that spread aggressively.

Thanks to this study we know about each of the more than 13,000 plant species that form the naturalized alien flora of the world – those that are known to have successfully naturalized anywhere in the globe – how common it is and where it grows.

The top ten most widely distributed species are naturalized on about a third of the globe surface, and the most frequently reported one, **common sowthistle** (*Sonchus oleraceus*) (photo 1), in almost a half of the world regions.

The most frequent invasive species is a shrub native to Central and South America, **lantana** (*Lantana camara*) (photo 2), recorded in a third of the world. An example of an aquatic plant with similarly broad distribution is the well-known **water hyacinth** (*Eichhornia crassipes*) (photo 3).



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ARC-PPRI, WEEDS RESEARCH DIVISION

Plant Protection Research

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



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