



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



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From Drought to Famine

South Africa's worst drought in more than 30 years led to vast tracts of denuded land in large parts of the country. Now recent good rains in northern Kwa-Zulu Natal and the lowveld of Mpumalanga has seen the massive resurgence of a rapidly-growing, invasive alien species called Famine Weed (*Parthenium hysterophorus*) which strongly outcompetes indigenous plants and cultivated crops, and causes allergic reactions in humans and animals. Left uncontrolled it can lead to famine, hence the name.

What is being done to control this plant? There have been efforts by various landowners and authorities to curb the spread and a biological control plan has been initiated, but a national plan to manage Famine Weed, which was drawn up two years ago, has not been implemented. The result is that it has spread to new areas; areas that were lightly invaded are now densely invaded and some areas which were critical to keep clean have now been invaded. For information on a proposed national strategy see Terblanche *et al.* 2016, ABC *Bothalia* 46(1), a2053, <http://dx.doi.org/10.4102/abc.v46i1.2053>



Famine Weed (*Parthenium hysterophorus*) invading pastoral land in Mpumalanga near the Lebombo border post with Swaziland (photo 1: Bongani Mashele, SANBI ISP). Famine Weed flowers (photo 2) and leaves (photo 3).

Red-flowering tea tree (*Melaleuca hypericifolia*)

Nolwethu Jubase and Ernita van Wyk, SANBI ISP, W Cape

Description.... Red-flowering tea tree (native to Australia) is a fast growing serotinous shrub or small tree up to 6 m high. Leaves are green and arranged distinctively in opposite pairs at right angles to those above and below (**photo 1**). The flowers are solitary within each bract and red in colour (**photo 2**). Flowers can be seen in Spring in South Africa. The plant has a weeping growth habit and develops slightly papery bark as it matures (**photo 3**). Seeds are stored in woody capsules in the plant canopy (**photo 4**). The species is currently listed as category 1a in the National Environmental Management: Biodiversity Act (NEM:BA) regulations.



Photo: L Henderson



Photo: L Henderson



Photo: L Henderson

History... Red-flowering tea tree was most likely introduced to South Africa as a garden ornamental. The date of its first introduction is unknown but judging from the large size and spread of the plants in Tokai Arboretum, these were probably part of the early plantings and development of the Tokai Arboretum since 1885. The Arboretum was initially an educational resource for students of the Forestry School at Tokai and may have incorporated experimental species by the Forestry Department of the time. The earliest record of an invasive population of red-flowering tea tree comes from the Southern African Plant Invaders Atlas (SAPIA). The record was lodged in 1998 and referred to plants on the western slope of Chapman's Peak near Hout Bay, Cape Town (**photo 5**). Prior to the present study, no systematic effort had been made to control the species.

The problem... Although it has been planted in a number of localities in Cape Town as an ornamental plant (mainly along roadsides where it does not spread), it was found naturalizing on the moist hill slope in Hout Bay and at De Waal Drive in Table Mountain National Park, Cape Town and in Kleinmond Town in an ornamental Municipal garden. The species is fire adapted, fast-growing and a prolific seed producer and it is able to invade pristine Fynbos, wetlands and rivers. It can therefore potentially displace the Fynbos.

Red-flowering tea tree (*Melaleuca hypericifolia*) continued

Management and Research... The Invasive Species Programme (ISP) and City of Cape Town's Rapid Response Invasive Species Unit, with funds from the Department of Environmental Affairs's Natural Resource Management Programmes, initiated action from August 2012 to learn more about the extent of the population in Hout Bay and to contain the spread of this species.

A contractor team of 12 people was employed annually to survey, map and remove plants from the Chapman's Peak slopes (**photo 6**). The aim was to control adult plants and remove seed pods before seed dispersal. Their work included data collection and involved taking GPS points of each individual plant, measured the height of each plant, canopy widths, stem base diameter, whether the plants were flowering at the time of data collection and the number of seed capsules present per plant. Seed capsules were collected, counted and placed in plastic bags to be incinerated at high temperature to kill the seeds. Seedlings were uprooted by hand and larger plants cut at the base of the stem and treated with 3% imazapyr herbicide mix.

In 2014 another red-flowering tea tree population was found naturalizing at De Waal Drive in Table Mountain National Park. The same contractor that cleared the Hout Bay population cleared this population using the same method. The results, spanning a period of 4 years, were published by Hickley *et al*, 2017. The aim of this study was to assess the invasive potential of red-flowering tea tree in South Africa and to determine whether eradication (nationally) of this plant species is feasible or not. With diligent annual surveys and clearing, the number of plants in the Chapman's Peak population was reduced and flowering completely suppressed. As search effort remained constant but clearing effort declined, the total cost at this site was reduced by 9 times over the study period.



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Conclusion... Red-flowering tea tree is not yet widespread within South Africa; with correct and integrated management, extirpation is feasible if management can detect and control all plants effectively at all known sites.

Future plans... We continue to monitor and manage all known red-flowering tea tree populations. The future plan for this project is to employ contractors every year to conduct follow-up operations.

References

Hickley, K.I., Kaplan, H., Van Wyk, E., Renteria, J.L. & Boatwright, J.S. 2017. Invasive potential and management of *Melaleuca hypericifolia* (Myrtaceae) in South Africa. *South African Journal of Botany*. 108:110–116.

What you can do to help:

Please report sightings of these plants to Nolwethu Jubase, Technical Assistant, SANBI Invasive Species Programme (ISP), Western Cape: Nolwethu Jubase Tel 021 799 8400 email: N.jubase@sanbi.org.za or at invasivespecies@sanbi.org.za. If possible, provide us with locality description, a photo and GPS co-ordinates.

Invasive aliens in the southern Cape

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With the all-year-round rainfall that occurs in the southern Cape, it seems that plants thrive here on an unprecedented scale. More so the aliens and we do seem to be overwhelmed by the numbers and diversity which is a huge threat to our local flora.

Four of the nine biomes in the country occur in our region these being: Fynbos, Forest, Albany thicket and Succulent Karoo, each having aliens that prefer the set of environmental conditions offered by each Biome.

Most problematic in the Succulent Karoo and Albany Thicket are the cacti which thrive in the hot dry conditions similar to where they originated. Species present are bunny ears cactus (*Opuntia microdasys*) (**photo 1**), imbricate cactus (*Cylindropuntia imbricata*), blue-leaf cactus (*Opuntia robusta*) (**photo 2**) and others.



Problematic species in the Fynbos include pines and some members of the Proteaceae such as rock hakea (*Hakea gibbosa*), silky hakea (*Hakea sericea*) (**photo 3**), which thrive in Fynbos habitats. Alien grasses which find a niche between Fynbos plants are numerous with notable species belonging to the genera *Avena*, *Briza*, *Bromus* (**photo 4**), *Hordeum*, *Lolium*, *Phalaris*, *Poa*, *Stipa* and *Vulpia*.



Photo: L Henderson

Invaders in the Forest Biome have a more difficult time as they have to compete for light and an open spot to get established, but the forest has species that flourish there too. Queensland poplar (*Homalanthus populifolius*) (**photo 5**), is from the Australian rainforest and thus is quite at home in our forests.



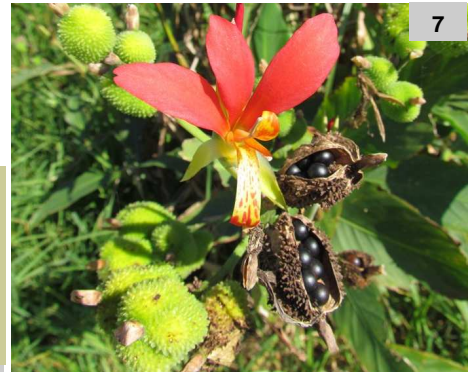
Passion fruit (*Passiflora edulis*) (**photo 6**) has been found growing in the Circles in a Forest hike, Knysna and is spread by monkeys and baboons as they eat the fruit.



Photo: L Henderson

Invasive aliens in the southern Cape continued

Other species spread by fruit eaters are tree tomato (*Solanum betaceum* (= *Cyphomandra betacea*)), Indian shot (*Canna indica*) (**photo 7**), and at least three ginger lily species—white ginger lily (*Hedychium coronarium*), yellow ginger lily (*Hedychium flavescens*) (**photo 8**), and Kahili ginger lily (*Hedychium gardnerianum*) are present in forest situations.



An invasive vine species quite common on forest margins is snake vine (*Hibbertia scandens*) (**photos 9a,b,c**) from the east coast of Australia. This plant can form large patches of pure stands, choking out any other vegetation. Pollinated flowers form small orange seeds which are most probably distributed by birds as they are somewhat fleshy. This species has been reported to the Department of Environmental Affairs to be included as a listed invader under NEM:BA.



The ubiquitous swordfern (**photo 10**) (*Nephrolepis cordifolia* subsp. *cordifolia*) (note the misapplication of the name *Nephrolepis exaltata*, Crouch *et al.* 2011) is also present in large numbers and is difficult to eradicate. It favours moist habitats like the invasive Pampas grass (*Cortaderia sel-loana*) (**photo 11**).

River valleys in all Biomes are infested with the usual suspects—black wattle (*Acacia mearnsii*), Australian blackwood (*Acacia melanoxylon*), and bugweed (*Solanum mauritanum*), sometimes growing in pure stands, choking out native species.

The coastal areas are infested with Port Jackson (*Acacia saligna*), rooikrans or rooipitjie (*Acacia cyclops*) and others.



The Garden Route needs to be taken back and invasive alien species eradicated. Much has been done to achieve this with the formation of SCLI (Southern Cape Landowners Initiative), George Municipality assisting with the provision of herbicides and dedicated individuals and groups contributing to alien eradication, however the landowners will make the most difference in this fight against invasive species.

References

Crouch, N.R., Klopper, R.R., Burrows, J.E. & Burrows, S.M. 2011. *Ferns of southern Africa: A comprehensive guide*. Random House Struik, Cape Town.

Needle Bush, *Vachellia farnesiana* (= *Acacia farnesiana*) naturalized in central KwaZulu-Natal

Richard Boon (RW), eThekweni Municipality, e-mail: Richard.Boon@Durban.gov.za
Roger Porter (RP) and Ingrid Weiersbye (IW)

There are 23 indigenous species of *Acacia sensu lato* or *Vachellia* and *Senegalia* in KwaZulu-Natal (KZN) and at least eight naturalized and invasive Australian *Acacia* species or wattles (Boon 2010). In June 2016 Roger Porter (RP) and Ingrid Weiersbye (IW) asked the author (RB) to identify a shrub species of *Vachellia* they found near Albert Falls Dam. The shrub resembled an indigenous *Vachellia*, but matched none of KZN's species. Besides flowering in mid winter, a remarkable feature was the clusters of cigar-like, dark pods suggesting that it may be introduced. Johan Hurter, based in Australia, kindly confirmed the identification of the plant as *Vachellia farnesiana* (L.) Wright & Am., a species he is familiar with as a weed. There are no records of this plant in the SAPIA database and only cultivated specimens at the Natal Herbarium.

On the farm where the plants were discovered, about 400–500 mature shrubs grow in scattered clumps stretching about 1.5 km along a non-perennial watercourse which drains into the Umgeni River just below Albert Falls Dam. The surrounding vegetation is KwaZulu-Natal Hinterland Thornveld. The farmer believes these plants originate from upstream. RP and IW have also found a mature plant downstream of the Dam on the banks of the Umgeni River, a direct distance of about 3.5 km from the main population. A quick reconnoitre of the district revealed no further plants, but a more thorough search is needed.

Needle bush (*V. farnesiana*) (**photo 1**) is a multi-stemmed shrub or small tree usually growing to about 4 m, but may reach 8 m. The bark (**photo 2**) is smooth, greenish and lenticellate when young. As it ages it becomes grey-brown, sometimes with circular patches of lichen. Branching is sub-erect. Branchlets zigzag, may be hairy towards the apex and have prominent lenticels.

Leaves (**photo 3**) are twice compound, the rachis reaches 55 mm long, the pinnae are in 1–7 pairs, pinnules are in 5–23 pairs and are greyish-green and hairy. The petiole is up to 20 mm long and there is a circular to elongated gland just below the first pair of pinnae (**photo 3**).

Spines are paired, white, short, usually 5–25 mm long and may be only sparsely present on some plants.

Flowering heads (**photo 4**) are globose, bright yellow or orange-yellow and fragrant with a number of heads in the leaf axils. Inflorescence stalks may reach 30 mm long and are hairy. Plants flower irregularly through the year peaking in winter.



Needle Bush, *Vachellia farnesiana* continued

Pods (photos 5a & b) are indehiscent, cigar-like, straight to strongly curved, swollen and reach about 90 mm x 20 mm. They ripen dark brown to blackish. Seeds are arranged transversely or obliquely and are separated by pith.

V. farnesiana is similar to the smaller, indigenous *Vachellia* species, but the clusters of cigar-like pods (present all year or almost so), peak winter/early spring flowering season, lack of sticky growing points and generally small spines (at least on specimens examined) should prevent confusion.

Originally from North and Central America tropics and sub-tropics (the exact native range is obscure), the species is naturalized in Africa, Asia and Australia. It is considered a serious weed in Fiji. *V. farnesiana* may be an aggressive colonizer and is mostly a weed of pastures where it is able to form dense thorny thickets, which may cause injury to livestock, hinder access to water and shade out native fodder species.

It is also a useful plant, for example the foliage is a significant source of forage and it is cultivated in Mediterranean countries for its fragrant flowers to make a perfume called Casie. Locally Village Weavers (*Ploceus cucullatus*) use the shrubs as colonial nesting sites.

Common names include Mimosa Bush, Sweet Acacia, Needle Bush and Husiache from Nahuatl meaning "many thorns".

Acknowledgements

Mr Neil Raw for permission to take specimens and photographs on his farm.

References

Boon R, 2010. *Pooley's trees of eastern South Africa*. Flora and Fauna Publications Trust.

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PlantNET New South Wales Flora Online: <http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Vachellia-farnesiana>. Website accessed 12 January 2017.

Mimosa Bush *Acacia farnesiana*. 2016. Queensland Department of Agriculture and Fisheries: https://www.daf.qld.gov.au/__data/assets/pdf_file/0007/74167/IPA-Mimosa-Bush-PP35.pdf. Website accessed 12 January 2017.



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ARC-PPRI, WEEDS RESEARCH PROGRAMME



Plant Protection Research

The Weeds Research Programme 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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