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### Plant Protection Research



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)

## Two weed alerts from SANBI-DBI in Limpopo and Mpumalanga



Photo: Bongani Mashale

Photo: Helmuth Zimmermann

The South African National Biodiversity Institute (SANBI), Directorate: Biological Invasions (DBI), has issued two new weed alerts for Mpumalanga and Limpopo—Mexican sunflower (*Tithonia tubaeformis*) (photo 1) and Blueberry ash (*Elaeocarpus angustifolius*) (photo 2). The public can assist SANBI-DBI by sending locality information of these species which can help assess their invasion status.

## New Centre for Biological Control (CBC) at Rhodes University

The Rhodes University Centre for Biological Control (CBC) will be officially opened on 2 November 2017 in Grahamstown, Eastern Cape Province.

Professor Martin Hill, Director of the CBC, has led the Biological Control Research Group within the Department of Zoology and Entomology since 2002. Over the years, the group has narrowed its focus to the classical biological control of weeds and the biological control of significant crop pests using microbial agents. Research is mainly aimed at national problems, but has also extended to other African projects in Morocco, Ghana, Cameroon, Kenya, Uganda, Mozambique and Madagascar. Farther afield, there is collaboration with colleagues in New Zealand, Australia, Argentina, Brazil, the USA and Europe.

The Centre will complement other biological control organisations locally and regionally using a holistic approach to biological control, including not only pre-release studies, but also quantifying the biodiversity and economic benefits of classical and inundative biological control. A further aim of the Centre will be to increase biological control capacity in South Africa and in Africa more broadly through short courses and nurturing undergraduate and postgraduate students.

Information extracted from a news article by Kim Weaver, Rhodes University,  
[K.Weaver@ru.ac.za](mailto:K.Weaver@ru.ac.za)



## Blueberry ash (*Elaeocarpus angustifolius*): is it another water-guzzling invasive tree?

Moleseng Claude Moshobane & Nyiko Mthembi (Directorate: Biological Invasions (DBI), South African National Biodiversity Institute (SANBI), inland region) and Mukundi Mukundamago (University of Venda)

### Background

Blueberry ash or blue quandong (*Elaeocarpus angustifolius*) is an evergreen broad-leaved tree belonging to the family Elaeocarpaceae and grows to a height of 30 m or more (photos 1 and 2). It produces iridescent blue fruits (photo 3) containing a hard and highly ornamental, deeply sculptured, stony endocarp known as a quandong. Furthermore it is highly prized for traditional medicine in Asia (Chopra *et al* 1956; Hardainiyan *et al* 2015). Blueberry ash is found throughout the Asia-Pacific and eastern Australia, with concentrations varying by sub-region (Hassler 2017). Its distribution has increased due to multiple introductions in various parts of the world such as Palau Isl., Western Samoa, Savaii, Andaman Isl., Nicobar Isl., Philippines, Vietnam (Hassler 2017) and South Africa.

### History

A few trees were introduced into Westfalia Estate, Modjajiskloof, Limpopo province by early silviculturists between 1930 and 1950 as forestry trials for lumber production (personal communication Dr Stefan Köhne, Westfalia Estate Manager). The trees have spread and covered an area of more than 4 ha, consisting of seeds, germinants, seedlings and mature plants which only occur along the edges where sunlight penetrates.

### The problem

Blueberry ash usually grows along watercourses. Although no studies have been conducted to understand their water usage, there are fears that it could be a high water-user like the Australian Acacia trees. Furthermore it creates problems by blocking off the sunlight to the detriment of sun-loving species. A survey conducted by Moshobane & Mthembu (2017) also noted that uphill invasion is generally restricted to areas with freshwater input and confined within the plantation. Additionally, it is most abundant in the northern parts of the initial introduction area, where the area is open without plantations.

Blueberry ash reproduces and expands through abundant and prolific seed production. It has been observed that individual plants can produce many seeds per season per year (Moshobane & Mthembu (2017)).

There has been a definite spread of trees in the past decade, and seedlings have emerged in large numbers several hundred metres downstream from where the few original old mother trees are growing. This area is one of the important water catchment areas of Westfalia and Dr Köhne has expressed his concern that the unintended rapid spread of hundreds of vigorously-growing blueberry ash trees in this area may be the origin of another invasive and water-hungry species which should be stopped before the problem gets big.

The enormous quantities of attractive fruit are eagerly eaten by many mammals and birds and contribute to its spread (personal communication HG Zimmermann).

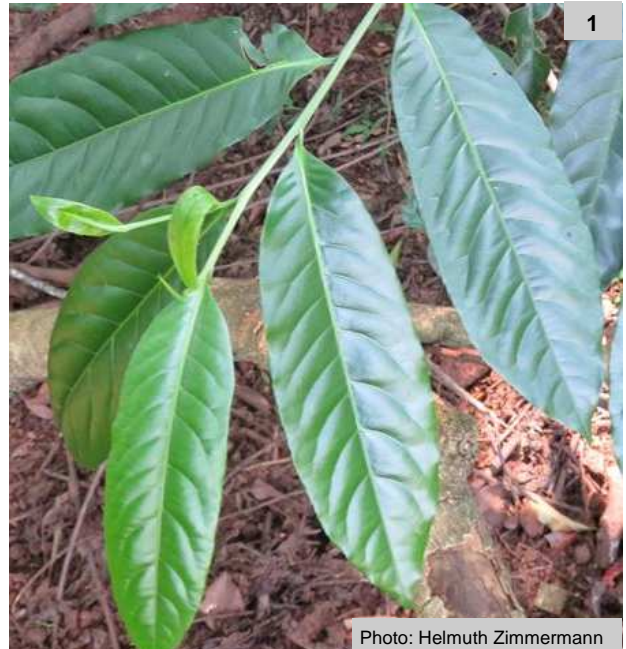


Photo: Helmuth Zimmermann



Photo: Helmuth Zimmermann



Photo: Helmuth Zimmermann

## Blueberry ash at Westfalia continued



Photo: Moshobane MC

There has been some confusion about the correct identification of the trees at Westfalia Estate. They were originally identified as *E. grandis* by early foresters while the first records in the SAPIA database are given as *E. reticulatus*.

### Management and Research

SANBI DBI staff have compiled a weed risk assessment and surveyed Westfalia Estate for spreading of the trees.

### Future plans

Plans are underway to conduct soil properties assessments, as well as seed viability and germinability tests. Extensive surveys of the area surrounding Westfalia Estate will be conducted in early November 2017. Investigation of impacts of *E. angustifolius* on ground-dwelling insects will commence in mid November 2017. Eventually, in the fall of 2017 an experimental control programme will be initiated for *E. angustifolius*.

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Photo: Helmuth Zimmermann

The infestation of blueberry ash at Westfalia Estate was first noted by Dr Stefan Köhne (photo 5). Note the well-developed buttress roots.

### How can you assist?

Please report sightings of these plants to Moleseng Claude Moshobane, SANBI-DBI, Limpopo, Inland region:

Tel 012 843 5013 and e-mail: [m.moshobane@sanbi.org.za](mailto:m.moshobane@sanbi.org.za).

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



## Mexican sunflower (*Tithonia tubaeformis*): a new threat to food security in South Africa

Bongani Mashele, Constance Mafuwane & Moleseng Claude Moshobane,  
Directorate: Biological Invasions (DBI), South African National Biodiversity Institute (SANBI), and  
David Simelane, ARC-Plant Protection Research, Weeds Division.

### Background

A newly introduced Mexican weedy sunflower, *Tithonia tubaeformis* (Asteraceae), initially discovered at Lomahasha (Swaziland) in 2011, has now spread to Mpumalanga province of South Africa. This is a third weedy Mexican sunflower to have been introduced into the country following the introduction of *Tithonia diversifolia* and *Tithonia rotundifolia* in the early 1900s. According to the National Environmental Management: Biodiversity Act (NEMBA), both *T. diversifolia* and *T. rotundifolia* are now declared category 1b weeds in South Africa.

In Mexico where *T. tubaeformis* originates, it is known as palocote. It has become invasive in the humid and sub-humid tropics of Central and South America, and South East Asia. *Tithonia tubaeformis* is known to have invasive tendencies in its native range (Mexico) despite the presence of its natural enemies in that country. Judging from the phenology of this weed in Mexico, the invasion by *T. tubaeformis* could be highly devastating in South Africa. *Tithonia tubaeformis* has also been recorded as invasive in Zambia where it is reported to be wreaking havoc on arable land.

### Description

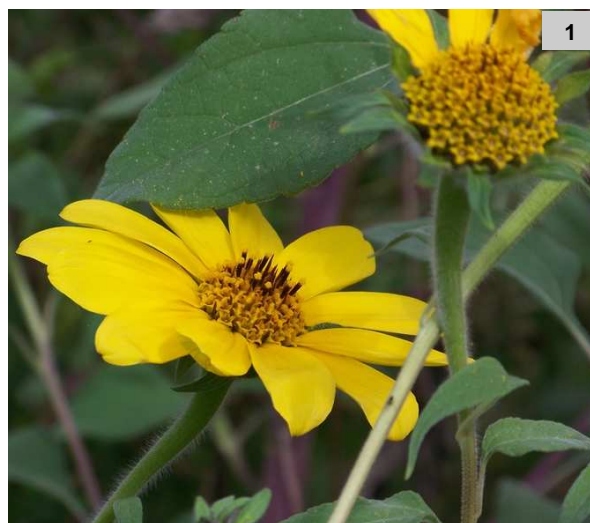
*Tithonia tubaeformis* is a large, evergreen, annual plant that grows up to 5 m tall. This new invader has hairy, simple, unlobed leaves and light yellow flowers (photo 1). *Tithonia rotundifolia* which is also annual, has orange-red flowers and leaves varying from simple to lobed (photo 2). *Tithonia diversifolia* is perennial, with yellow flowers and deeply lobed leaves (photo 3). *Tithonia tubaeformis* produces fewer, larger and heavier seeds, ensuring vigorous seedling growth and longer survival in a nutrient-poor environment. In South Africa, the flowering of this species occurs from later summer to late autumn.

The genus *Tithonia* has 11 species, with the centre of distribution in Mexico but with one species extending into the southwestern USA and several extending into Central America (Muoghalu & Chuba (2005)).

### First detection and current distribution in South Africa

*Tithonia tubaeformis* was first spotted by David Simelane in the Lebombo mountain area along the South Africa-Swaziland border in a village called Lomahasha in 2011. Later in 2014, several large populations were found at two rural communities near Samora Machel Monument in Nkomazi Local Municipality, Mpumalanga Province, by Mpumalanga Regional coordinator, Bongani Mashele (SANBI DBI).

In 2016, a few plants were found in the south of Swaziland, at Hluti Village, approximately 10km from Pongola in KwaZulu-Natal. Several field trips have since been undertaken by the Regional coordinator and the Contract Manager, Constance Mafuwane, to monitor and quantify the populations of the invader. *Tithonia tubaeformis* has spread rapidly throughout Mbuzini and Goba villages in Nkomazi where it invades home gardens and grazing land.



*Tithonia tubaeformis* has yellow flowers with simple, unlobed leaves.



Photo: Lesley Henderson

*Tithonia rotundifolia* has orange-red flowers with simple to lobed leaves.



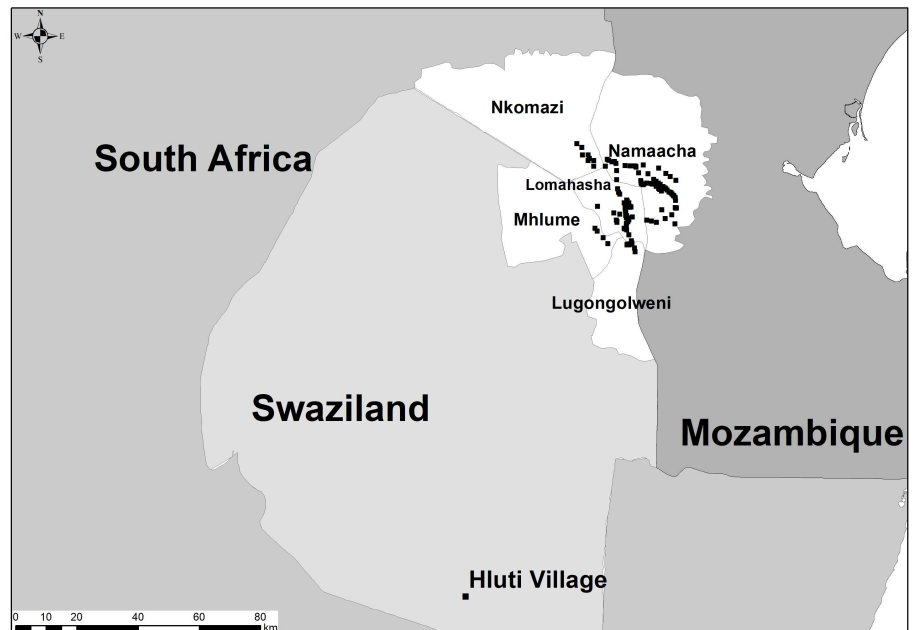
Photo: Geoff Nichols

*Tithonia diversifolia* has yellow flowers with deeply lobed leaves.



## *Tithonia tubaeformis*: a new threat

The current known distribution of *T. tubaeformis* is shown in the map.



### Impact in South Africa

Currently, *T. tubaeformis* is not regulated in South Africa although it scored 16 on the Australian Weed Risk Assessment (AWRA), meaning that the species should be rejected at the point of entry into South Africa. Our preliminary observations suggest that *T. tubaeformis* poses a threat to the biodiversity as well as ecological integrity of natural and agricultural systems in South Africa (**photo 4**). As it is the case in Swaziland and Zambia where *T. tubaeformis* is reported to be invading arable and grazing land (**photo 5**), the weed is posing a direct threat to food security in South Africa and the neighbouring countries.

There are no herbicides registered for controlling *Tithonia* species in South Africa. Although mechanical control may be possible, its implementation may not be cost-effective due to rapid re-infestation from the seed bank. The Weeds Division of the Agricultural Research Council (ARC-PPR) is currently conducting biocontrol research aimed at developing biocontrol agents for two *Tithonia* species (i.e., *T. diversifolia* and *T. rotundifolia*), and is currently seeking funding to include *T. tubaeformis* into the biological control programme.



## *Tithonia tubaeformis*: a new threat

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### How can you assist?

Please report sightings of *Tithonia tubaeformis* 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.

Contact details: [invasives@sanbi.org.za](mailto:invasives@sanbi.org.za)

Bongani Mashele, Regional co-ordinator, Mpumalanga Province: Tel 013 752 6504 or [b.mashele@sanbi.org.za](mailto:b.mashele@sanbi.org.za)



## 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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