

The Myrtle Rust pathogen has arrived

And South African Myrtales are at risk

ABOVE: Yellow spores of Myrtle Rust (*Puccinia psidii*) on the leaves of an infected Rose Apple (*Syzygium jambos*).

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For many years Australian forest pathologists and other scientists have dreaded the arrival of the rust fungus, *Puccinia psidii*, commonly known as Myrtle Rust, in Australia. This pathogen eventually did arrive in that country and was first detected in New South Wales in 2010 on Willow Myrtle (*Agonis flexuosa*). It is generally accepted that it entered the country on an ornamental Myrtales* host brought in by a private nursery. Despite efforts to eradicate the invasive rust, it has already spread widely, now occurring along the east coast of Australia, from temperate areas in Victoria and southern North South Wales to tropical areas in north Queensland.

As was anticipated by scientists, *P. psidii* is causing significant damage to some of their native Myrtales. The pathogen, described by many as 'the biggest threat to the ecosystem', is seemingly living up to predictions and botanists fear the complete destruction of some Australian Myrtaceae. Although only known in Australia for three years, Myrtle Rust (*P. psidii*) has spread from its original point of first detection in New South Wales, all along the eastern coast of the country and it is continuing to spread. Some of the most susceptible native hosts, e.g. *Eugenia reinwardtiana* and *Rhodamnia rubescens*, have now experienced multiple years of shoot and tip die-back, and growing instances of flower and fruit infection have been observed. Similarly, Broad Leaved Paper

Bark (*Melaleuca quinquenervia*), a dominant species in coastal wetlands, has shown evidence of being significantly impacted on, particularly from a regeneration sense, with seedling growth and flower development affected. The infection of flowers and fruit has now been recorded on more than 25 plant species. This is of special concern since the impact on reproduction of these plants would threaten their survival, and thus the complete transformation of native ecosystems in Australia.

Puccinia psidii was first described in 1884 from guavas in Brazil, but has been best known for the impact it has had on plantation-grown eucalypt trees, especially in Brazil. Infection of eucalypts results in leaf and shoot death and die-back of young material, stunting plants and significantly reducing growth of susceptible plants.

It is generally accepted that *P. psidii* is native to South and Central America, where it co-evolved with native South American plant hosts. Although present on native Myrtales in that region, the impact of the fungus on native hosts is limited. However, where *P. psidii* has spread to related, non-native Myrtales such as species of eucalypts and introduced *Syzygium jambos*, in South America, the impact has been severe. Where plants, including trees, have been exposed to pests and pathogens to which they have not evolved a natural resistance, the consequences have often been severe. In

some cases this has resulted in a complete change to natural ecosystems due to disease caused by an introduced pathogen or pest.

Myrtle Rust (*P. psidii*), like other rust fungi, is well suited to spread between regions and countries. Studies conducted by an international team of scientists including Australian and Brazilian forest pathologists showed that its spores can be detected on watch straps, clothing and on the hair of people who had visited areas having large numbers of infected plants. However, the greatest risk factor remains the movement of the fungus on infected plant material. The possibility of it spreading over long distances via air currents also cannot be discounted and it has been reported for rust pathogens of cereal crops, also between Africa and Australia.

Researchers of the Tree Protection Co-operative Programme (TPCP, <http://www.fabinet.up.ac.za/tpcp>), Forestry and Agricultural Biotechnology Institute (FABI), of the University of Pretoria, have been concerned about the arrival of Myrtle Rust (*P. psidii*) in South Africa for many years. Members of the TPCP team have thus been involved in international research projects on this rust pathogen for more than two decades. This work has included the screening of South African grown *Eucalyptus* genotypes, as well as available native Myrtales, for their susceptibility to Myrtle Rust (*P. psidii*). These experiments were



ABOVE: Yellow spores of Myrtle Rust (*Puccinia psidii*) on guava fruit.

ABOVE LEFT: Flower and fruit infection of Australian *Rhodamnia* which could mean the end for this species.

LEFT: A warning to visitors to a public park invaded by Myrtle Rust in Australia. Spores of the fungus are easily spread, for example on clothing and hands.



***Myrtales** An order of trees and shrubs that includes the Myrtaceae and Combretaceae. In South Africa, genera in the Myrtaceae include *Syzygium*, *Eugenia* and *Metrosideros* as well as the alien *Eucalyptus* and *Psidium*; while in the Combretaceae *Combretum* and *Terminalia* are common and widespread bushveld species.

We encourage all plant enthusiasts to report signs and symptoms of tree disease to FABI at the University of Pretoria (<http://www.fabnet.up.ac.za>).

GET CONNECTED

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READING

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conducted in Brazil, using seed germinated in that country. Results showed that native South African *Heteropyxis natalensis* is highly susceptible to infection by Myrtle Rust (*P. psidii*). In fact, it was one of the most susceptible species tested at the time.

In late May 2012 the presence of Myrtle Rust (*P. psidii*) was confirmed for the first time in South Africa. It was found on a single, non-native *Myrtus communis* plant in a private garden on the KwaZulu-Natal South Coast. To date, it has not been found on any other Myrtaceae, native or non-native in that region. Home-owners, nursery owners and managers and conservationists are requested to keep a sharp look-out for the pathogen and to report any occurrences to the TPCP team at the University of Pretoria.

All South Africans, particularly nature lovers, nursery owners or workers and scientists need to become actively involved in trying to reduce the chances of devastating pathogens, such as *P. psidii*, being introduced into South Africa. As part of this effort, we must promote stricter quarantine enforcement and voice our concerns to the relevant authorities of Government. We should also take special care when we travel abroad and resist temptations to bring any type of material into the country without treatment and a sufficient quarantine period. It also helps to spread the word to family, friends, colleagues and the general public.