Update on Myrtle Rust in the Top End

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Abstract

Potential impacts of the plant pathogen Myrtle Rust (Austropuccinia psidii) on Myrtaceae in the Top End of the Northern Territory were discussed in the previous issue of the Northern Territory Naturalist (Westaway 2016). This note provides an update on the spread and effect of this disease in this part of the Northern Territory. Myrtle Rust is newly reported from Bathurst Island and, importantly, also from East Arnhem Land. The native host shrub Lithomyrtus retusa is highly susceptible to this disease, suffering serious dieback and ultimately plant mortality.

Myrtle Rust is a fungal plant disease that attacks various species of Myrtaceae (the myrtle plant family). Myrtle Rust is believed to be native to South and Central America but is now found in many parts of the world, including Australia where it was first detected on the east coast in 2010 (Carnegie et al. 2010).

The pathogen infects not only young, actively-growing foliage and new shoots, but also flower buds and fruit, causing lesions that coalesce (Figure 1) resulting in tissue dehydration, distortion and plant dieback.

Myrtle Rust has been known in the past as Guava Rust or Eucalyptus Rust, and scientifically as Puccinia psidii of the family Pucciniaceae. However, following recent phylogenetic analysis (Beenken 2017), Myrtle Rust has been renamed as Austropuccinia psidii, and placed within the redefined family Sphaerophragmiaceae.

Myrtle Rust was first detected in the Northern Territory in May 2015 at a remote location on Melville Island during a survey by the Northern Australia Quarantine Strategy (Westaway 2016). On Melville Island it was found infecting a single cultivated Beach Cherry (Eugenia reinwardtiana), several cultivated Ti-trees (Leptospermum madidum) and extensive stands of the native shrub Lithomyrtus retusa (Westaway 2016). It was found in suburban and rural Darwin later that year. Myrtle Rust seemed confined geographically in the Northern Territory and was limited to only a small number of host plants, that is those listed above plus cultivated White Bush Apple (Syzygium armstrongii). The pathogen also appeared not to have spread far, being reported from only one additional location in the rural Darwin–Howard Springs area (pers. comm. Northern Territory Department of Primary Industries and Resources, May 2017). Nor had it caused significant plant damage (until apparently recently).
On 9 May 2017, Myrtle Rust was found infecting a single cultivated *Eugenia reinwardtiana* at Gapuwiyak, the first record of this pathogen in Arnhem Land. A second cultivated *E. reinwardtiana* at nearby Galiwinku showed unconfirmed early signs of infection, though the rust on this plant was not sporulating. How the pathogen reached remote East Arnhem Land is unclear but North Australian Quarantine Survey (NAQS) plant host survey data indicate that the particular *E. reinwardtiana* plant was present in Gapuwiyak since at least 2014 and so the rust is unlikely to have arrived as infected plant material, thus subsequent contamination by spores seems likely. Myrtle Rust spores are microscopic and can spread readily across large distances by wind, or via insects, birds, people, or machinery. The spores are believed to be capable of crossing oceans on wind currents as Myrtle Rust reached New Zealand, and Norfolk Island, and the Kermadec Islands (approx. 1000 km north-east of New Zealand) in 2017, all presumably by wind-borne spores from Australia.

On 30 May 2017, Myrtle Rust was found at a remote outstation and on the roadside in the southern part of Bathurst Island. The infection was on *Lithomyrtus retusa*, the same native shrub that was observed to be heavily infected on Melville Island in 2015. This is the first report of the disease from Bathurst Island, although inspection of plants in 2015 was confined to the main community Wurrumiyanga.

Myrtle Rust was also observed on cultivated Ti-tree (*Leptospermum madidum*) at Milikapiti airport on Melville Island in May 2017. Also on Melville Island, light Myrtle Rust infection of several *L. madidum* trees at the Yapilika forestry station was recorded in 2015, and these trees were maintaining their apparent health despite ongoing light infection.

Interestingly, Rose Myrtle (*Syzygium jambos*), which also occurs at the forestry station, has remained asymptomatic despite it being regarded as a highly susceptible host (Anderson & Uchida 2008; Morin *et al.* 2011; Makinson 2012). *Syzygium jambos* plants at Parap in Darwin have also remained unaffected, as has the cultivated *E. reinwardtiana* at the George Brown Darwin Botanic Gardens.
Myrtle Rust has subsequently been recorded on Groote Eylandt in East Arnhem Land in May 2018, infecting the widespread susceptible native shrub *Lithomyrtus retusa* (pers. comm. Ian Cowie). Myrtle Rust was also recorded for the first time in the neighbouring country of Timor-Leste in September 2017, where a number of cultivated *Syzygium jambos* trees and the shrub *Eugenia reinwardtiana* are infected (NAQS survey data).

The most significant development in the three years since the first detection of Myrtle Rust in the Northern Territory is that *Lithomyrtus retusa*, the main native host plant affected, has now been observed to suffer major mortality of individuals, at least on Melville Island, where the original infection levels were high. In 2015 disease symptoms on *L. retusa* included minor distortion and abscission of young foliage and dieback of severely infected branch tips, but three years later many shrubs are now dead (Figures 2–5). Mortality appeared to be most prevalent in shaded firebreaks perpendicular to a main road (Figure 4) and may consist of a substantial proportion of the *L. retusa* population in places. Other individuals were in advanced stages of infection with several branches dying back. Dead or dying *L. retusa* shrubs were also observed at the Taracumbi Falls area (Figure 5).

**Figure 2.** *Lithomyrtus retusa* mortality, Melville Island, June 2017. (John Westaway)

**Figure 3.** Patchy dieback of *Lithomyrtus retusa* shrubs on roadside (with *Acacia mangium* plantation behind), Melville Island, June 2017. (John Westaway)
Although there are now hundreds of myrtaceous plant species known to be capable of being infected by Myrtle Rust (Anderson 2006), in Australia (Makinson 2012; Giblin & Carnegie 2014), only very few of these are presently known to be so detrimentally impacted that plants are actually killed (Tommerup et al. 2003; Carnegie et al. 2015). Arguably the Australian species most severely affected by Myrtle Rust thus far are the east coast rainforest trees *Rhodamnia rubescens* and *Rhodomyrtus psidioides*, where a causal association between pathogen rust and tree mortality has been demonstrated in field experiments (Carnegie et al. 2015).

The *Lithomyrtus retusa* shrubs at Berry Springs that were seen to be relatively lightly infected with Myrtle Rust in 2015, were observed in June 2017 to have deteriorated considerably in the intervening period, with plants showing significant levels of infection, abundant leaf tip damage and even some branch death leaving some shrubs half dead (Figure 6). Plant loss in the shrub stratum may have implications for these vegetation communities

**Figure 4.** *Lithomyrtus retusa* mortality along a forestry firebreak, Melville Island, June 2017. (John Westaway)

**Figure 5.** *Lithomyrtus retusa* dieback, Taracumbi, Melville Island, June 2017. (John Westaway)

**Figure 6.** *Lithomyrtus retusa* dieback, Berry Springs, June 2017. (John Westaway)
and their associated wildlife. Heavy Myrtle Rust infection of *L. retusa* shrubs and the accompanying spore loads in, and adjacent to, *Acacia mangium* plantations on Melville Island may pose a potential quarantine issue for export of wood products.

Detection of Myrtle Rust in Arnhem Land, the apparent low level of disease spread around Darwin, and the serious impact of the pathogen on the native shrub *Lithomyrtus retusa*, confirm that the long-term effects of Myrtle Rust on Top End environments remains uncertain.

**References**


Morin L., Aveyard R. and Lidbetter J. (2011) Myrtle rust: host testing under controlled conditions. CSIRO Ecosystem Services and NSW Department of Primary Industries.
