

DISEASE NOTES OR NEW RECORDS

First record of grapevine leaf rust in the Northern Territory, Australia

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Abstract. Grapevine leaf rust, caused by *Phakopsora euvtitis* Y. Ono, was detected on grapevine leaves (*Vitis* sp.) in Darwin, in the Northern Territory. This is the first record of this pathogen in Australia.

In July 2001 symptoms typical of grapevine leaf rust, caused by *Phakopsora euvtitis* Y. Ono, were noticed on leaves of a grapevine (*Vitis* sp.) growing in a residential backyard in Darwin. The upper surface of leaves displayed small, dark, angular, necrotic lesions and the lower surface was covered in sporulating pustules. Large numbers of yellow, powdery spores were evident on the pustules (Fig. 1). Heavily infected leaves were chlorotic. Microscopic examination revealed erumpent uredinia containing obovoid, echinulate urediniospores and hyaline paraphyses. The morphology of all fungal structures and disease symptoms matched those described by Ono (2000). Herbarium specimens of the rust were prepared, gamma irradiated and deposited (BRIP 27996).

Subsequent public-awareness campaigns led to the detection of 219 vines on 125 properties in Darwin, 44 of which had grapevine leaf rust. A further 23 vines were located on 17 properties, one of which was infected, in Palmerston, a satellite city of Darwin. In the Darwin rural area, 21 vines on 16 properties were located, none of which were infected. The number of infected vines may increase as not all vines have been inspected. The presence of the disease in Palmerston, approximately 15 km from the closest infection in Darwin, indicates that the disease is more widespread than previously thought. The presence of uninfected vines near heavily infected vines suggests that some of the grape cultivars present in Darwin may be resistant to the disease. Resistance is known to occur within some *Vitis* hybrids, particularly those derived from *V. rotundifolia*, *V. tiliaefolia*, *V. simpsoni*, and *V. coriacea* (Clayton and Riding 1970; Leu 1988). The identity of the majority of grape cultivars in Darwin is unclear. Infected vines from the first detections were removed with the

owners' consent and options for the eradication of the disease are being investigated. The disease appears to be restricted to the Darwin area. It has not been recorded in other states of Australia or in other areas of the Northern Territory including the commercial grape growing areas near Alice Springs.

Grapevine leaf rust has a wide distribution, occurring throughout the tropics, from India to Indonesia and in the Americas including Florida, Jamaica, Colombia and Venezuela. Although considered a disease of the tropics and subtropics, the distribution of *P. euvtitis* also extends into northern temperate regions including Japan and North and South Carolina in the United States (Anonymous 2001).

No reliable figures are available on the economic impact of the disease although in tropical regions the disease can be very destructive if not controlled (Leu 1988). Heavy infection at harvest in these areas can cause considerable fruit quality reduction and yield loss. The resultant premature leaf loss during the growing period can also cause poor shoot growth, which may retard subsequent growth and fruit set (Anonymous 2001). In cool temperate areas, initial infection is not expected to reduce yield but production may be reduced in subsequent years (Y. Ono, personal communication 2001).

Originally recorded as *Physopella ampelopsidis* Dietel & P. Syd., a pathogen of genera in the Vitaceae, the species was shown to be a complex by Ono (2000). This species complex was subsequently separated into three species based upon uredinial and telial hosts (Ono 2000). *Phakopsora ampelopsidis* sensu Dietel & P. Syd. forms uredinia and telia on plants in the genus *Ampelopsis*; *Phakopsora vitis* sensu P. Syd. on *Parthenocissus* and the third species, a new species, *Phakopsora euvtitis* Y. Ono on *Vitis* (Ono 2000). The division

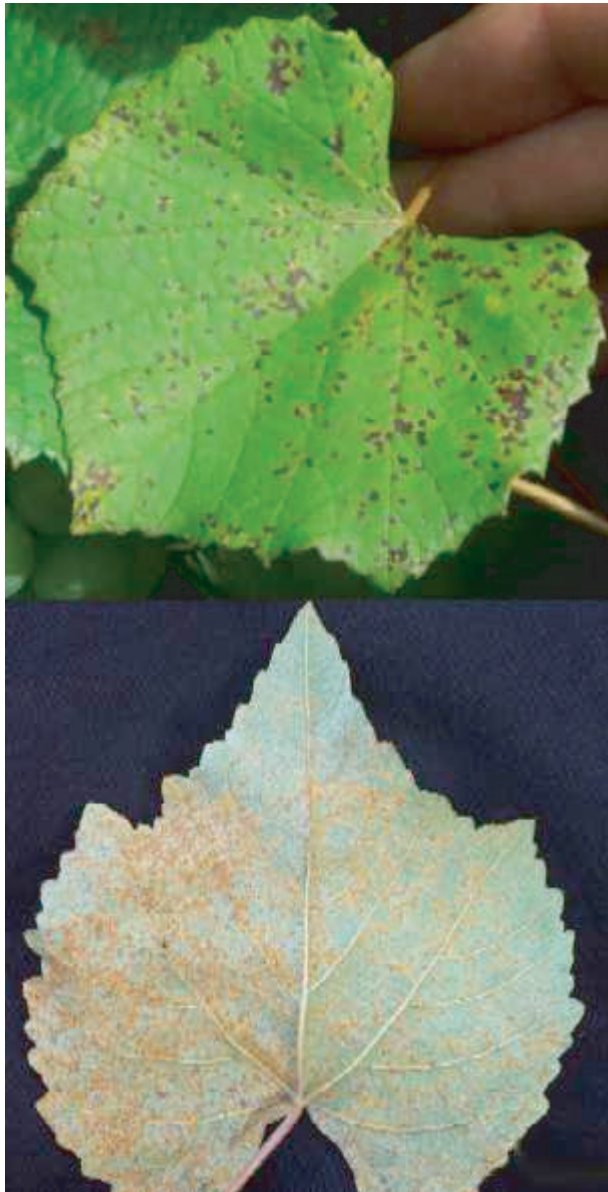


Fig. 1. Disease symptoms on upper leaf surface, and pustules on lower leaf surface, of grapevine leaf rust caused by *Phakopsora euvitis*.

of the complex into three species, with different hosts in the Vitaceae, allayed earlier fears that the pathogen could establish on endemic vitaceous genera, namely *Ampelocissus*, *Cissus*, and *Cayratia*. Surveys of these species in areas close to infected grapes have failed to find any infection.

P. euvitis is heteroecious and macrocyclic. Basidiospores are formed from teliospores in overwintered *Vitis* sp. leaves and infect *Meliosma myriantha* (family Sabiaceae), the alternate host. Pycnidia and aecia are formed on *M. myriantha* leaves following infection (Ono 2000). *M. myriantha* is not known to occur in the Northern Territory (Parks and Wildlife Commission of the Northern Territory Herbarium Database Checklist 2001), but as grapevines have no dormant phase in the Darwin area, it is possible the disease could persist via uredinial infections. Field observations over several years suggest that the disease may survive unfavourable conditions as uredinial mycelia in dormant buds. Urediniospores formed on the infected shoot then become the primary inoculum (Y. Ono, personal communication).

The source of the pathogen in the Northern Territory is not known. Surveys by the Northern Australia Quarantine Strategy have determined that it is present in East Timor as well as in the Indonesian province of Papua (formerly Irian Jaya). The pathogen may have been carried into northern Australia from south-east Asia by monsoon weather systems, on clothing or with illegal propagating material. Although rust pathogens are considered accomplished intercontinental travellers, wind-borne arrival via monsoon weather patterns from south-east Asia may be doubtful as the uredinial wall is thin and non-pigmented and unlikely to survive desiccation or UV radiation for extended periods of time (Y. Ono, personal communication).

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