

DISEASE NOTES OR NEW RECORDS

***Heteropyxis natalensis*, a new host of *Puccinia psidii* rust**

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Abstract. Artificial inoculation tests have shown that *Heteropyxis natalensis* is a new host of the *Eucalyptus* rust fungus *Puccinia psidii*. This tree resides in the Heteropyxidaceae, a southern African family, and it is the first species outside the Myrtaceae shown to be susceptible to *P. psidii*. *H. natalensis* was highly susceptible to infection by the rust and would be severely damaged if the pathogen were accidentally introduced into Southern Africa.

The *Eucalyptus* rust fungus, *Puccinia psidii* Winter, is one of the most serious threats to native forests and plantations worldwide (Coutinho *et al.* 1988). The fungus is native to South and Central America. It spread to, or was introduced to, the Caribbean Islands before 1934 and has recently spread to Florida (MacLachlan 1938; Rayachhetry *et al.* 2001). The fungus has infected some *Eucalyptus* species in these areas. If it were introduced into countries such as Australia, where *Eucalyptus* species are indigenous and dominant in many forest communities, at least some of these species would be put at risk (Tommerup *et al.* 2003). Hence, an international collaborative project including Australia, Brazil and South Africa was launched and established to evaluate the global threat of *P. psidii*.

As part of our research, we have undertaken artificial inoculation trials in Brazil, where many native Myrtaceae and related plants from Australia and South Africa have been exposed to *P. psidii*. An intriguing outcome has been that a South African seed source of *Heteropyxis natalensis*, a member of the Heteropyxidaceae, was found to be highly susceptible to infection by *P. psidii*. Both of the families, Heteropyxidaceae, commonly known as the lavender tree family, and the Myrtaceae, reside in the Myrtales. Only one genus, *Heteropyxis*, and three species, *H. canescens* Oliv., *H. dehnii* Suess. and *H. natalensis* Harvey are recognised in the Heteropyxidaceae. The last species, which was tested against *P. psidii*, is a deciduous tree that occurs naturally in coastal and inland regions of South Africa (Kwazulu-Natal, Mpumalanga, provinces), Swaziland and Zimbabwe.

Seeds of *H. natalensis* from South Africa were germinated on moistened germination-test paper in germination boxes maintained at 20°C in the dark. When seeds began to

germinate, they were transferred to potting mixture in conical plastic tubes and maintained under nursery conditions. Ninety days later, 60 seedlings were inoculated with a spore suspension of 2.4×10^4 /mL urediniospores of the predominant *P. psidii* pathotype in Brazil (UFV-1). After 24 h of incubation in a mist chamber in darkness, the inoculated plants were transferred to a growth chamber at 22°C with 12 h photoperiod (40 μ mol/s/m²). Twelve days later, rust was assessed using the scale of Junghans *et al.* (2003) where plants scored as S0 and S1 classes were considered as resistant and S2 and S3 as susceptible. Although a high variability in resistance was found, most plants (75%) were highly susceptible (S2 and S3). In addition to planting resistant genotypes, rust can also be controlled by fortnightly sprays of triadimenol (0.5 g a.i./L) or azoxystrobin (0.1 a.i./L) (Alfenas *et al.* 2004).

Uredinial pustules, containing urediniospores, developed on the inoculated seedlings (Fig. 1A–C). Urediniospores were 10–20 \times 15–25 μ m, yellow, unicellular, varying from spherical to elliptical (Ferreira 1989). Teliospores have not formed so far. We believe the reason is because the leaves of *H. natalensis* are very tender and so do not provide an environment conducive to the development of teliospores. This is the first report of *P. psidii* infecting a plant species belonging to a family other than the Myrtaceae. These findings raise the concern that the threat of *Eucalyptus* rust to the flora of countries outside South and Central America extends beyond the family Myrtaceae, in which an increasing number of genera and species are being found to be susceptible (Tommerup *et al.* 2003). Future evaluations should thus include a wider range of plants in the Myrtales. Quarantine procedures to

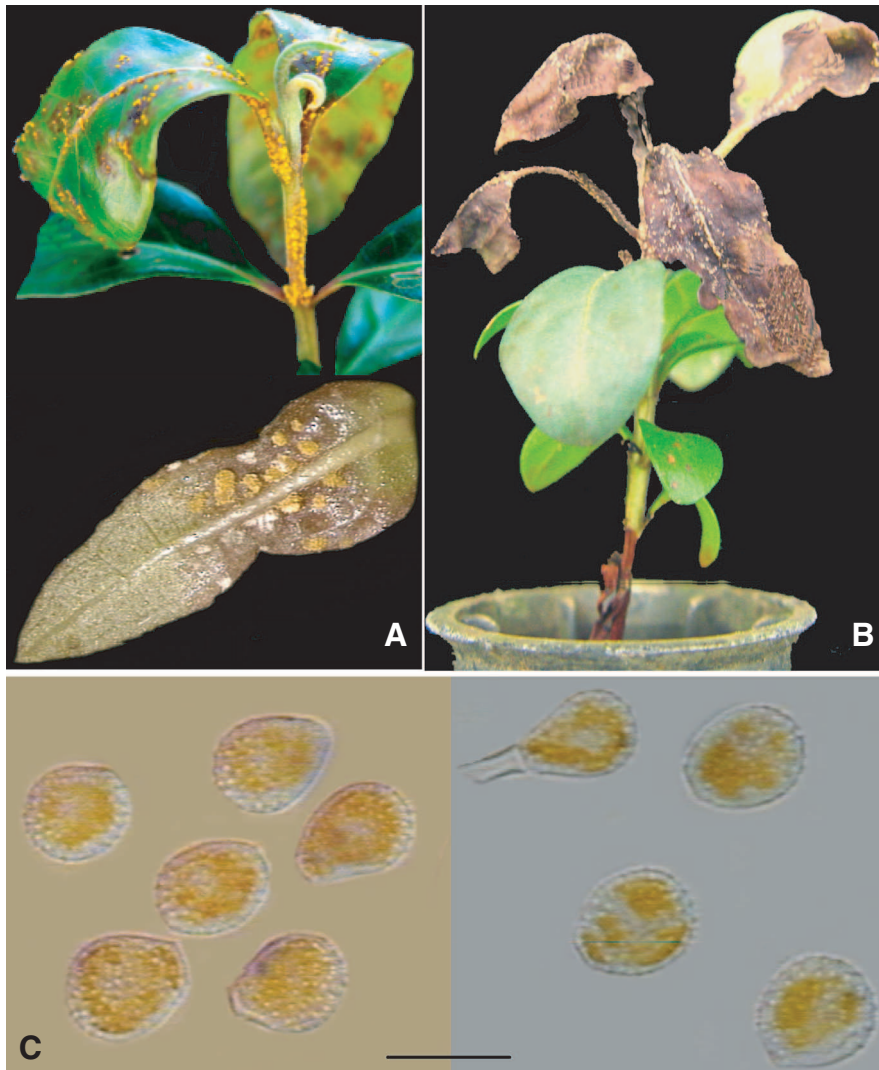


Fig. 1. Rust infection (caused by *Puccinia psidii*) of inoculated plants of *Heteropyxis natalensis*: (A) Infected live shoot and leaves, and naturally senesced older leaf (inset) with urediniosori. (B) Death of the apical portion of a seedling with old uredinial pustules. (C) Urediniospores (bar = 20 µm).

exclude *Eucalyptus* rust should also be cognizant of the fact that this pathogen has a wider host range than previously assumed.

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