

Movement of pathogens between horticultural crops and endemic trees in the Kimberleys

T.I. Burgess^A, J.D. Ray^B, M.L. Sakalidis^C { XE "Sakalidis, M.L." }^A, V. Lanoiselet^C, G.E.StJ. Hardy^A
^ASchool of Biological Sciences and Biotechnology, Murdoch University, Murdoch, 6150, Australia
^BAustralian Quarantine and Inspection Service, NAQS/OSP, Marrara NT, 0812
^CDepartment of Agriculture and Food' Baron-Hay Court' South Perth, 6151, WA

INTRODUCTION

Recently a survey of endophytes associated with baobabs (*Adansonia gregorii*) and associated tree species in the Kimberleys, Western Australia has resulted in the description of seven new species in the Botryosphaeriaceae (Pavlic *et al.* 2008). Additionally several common species of *Lasiodiplodia*, (*L. theobromae*, *L. pseudotheobromae* and *L. parva*) were also isolated as endophytes of endemic tree species.

Concurrently, surveys in the Ord River Irrigation Area (ORIA) have revealed *Mangiferum indica* trees showing symptoms of dieback and cankers. In this project we isolated, identified and determined the pathogenicity of fungi associated with these cankers.

MATERIALS AND METHODS

Isolation and identification. Fungi were isolated from cankers using standard techniques. Due to the similarity in morphological features among the Botryosphaeriaceae, molecular identification was conducted by extracting DNA, amplifying and sequencing the ITS and EF1- α gene regions (Burgess *et al.* 2005) and conducting phylogenetic analysis to identify cryptic species.

Pathogenicity trials. Trials were conducted using unripe but mature Kensington pride mangoes. The mangoes were washed in water then submerged in 1.5% NaOH (Bleach) solution for 2 minutes to disinfect. Mangoes were then allowed to air dry and were stored overnight at temp 28–33°C. Mangoes were inoculated with 11 fungal isolates (9 replicates per isolate), by wounding with the tip of a sterile pipette and immediately placing a colonised agar plug mycelia side down over the wound. After 6 days the lesions were measured.

RESULTS AND DISCUSSION

Seven species from the Botryosphaeriaceae were isolated from mangoes in the ORIA. Three of these species, *L. theobromae*, *N. ribis* and *N. dimidiatum* are known pathogens of mangoes causing either cankers or post-harvest disease. Four species, *P. adansoniae*, *N. novaehollandia*, *L. pseudotheobromae* and *L. parva* have not been reported previously from mangoes, but are commonly found as tree endophytes in the surrounding region.

All tested species were pathogenic to mangoes, with *Lasiodiplodia theobromae* causing the largest lesion followed by the *Neoscytalidium spp.* *P. adansoniae* caused the smallest lesions.

Table 1. Species of Botryosphaeriaceae isolated as endophytes of endemic trees in the Kimberleys and causing disease in mangoes in Kununurra

| Species | Mangoes | Trees |
|---------------------------------------|---------|-------|
| <i>Pseudofusicoccum adansoniae</i> | | # |
| <i>Pseudofusicoccum kimberleyense</i> | | # |
| <i>Pseudofusicoccum ardesiacum</i> | | # |
| <i>Lasiodiplodia theobromae</i> | | |
| <i>Lasiodiplodia pseudotheobromae</i> | | |
| <i>Lasiodiplodia parva</i> | | |
| <i>Lasiodiplodia margaritacea</i> | | # |
| <i>Lasiodiplodia crassispora</i> | | |
| <i>Dothiorella longicollis</i> | | # |
| <i>Fusicoccum ramosum</i> | | # |
| <i>Neoscytalidium novaehollandia</i> | | # |
| <i>Neoscytalidium dimidiatum</i> | | |
| <i>Neofusicoccum ribis</i> | | |

denotes species newly described by Pavlic *et al.* 2008

Common endophytes and latent pathogens of mangoes, *Neofusicoccum mangiferae*, *N. parvum* and *Botryosphaeria dothidea*, were not isolated in the ORIA. In addition *N. ribis* was isolated very rarely. The most commonly isolated pathogens were *L. theobromae*, *P. adansoniae* and the two *Neoscytalidium* spp. interestingly these fungi are also common in the surrounding endemic vegetation. It appears that many of the pathogens of mangoes in the ORIA have moved onto the trees from the surrounding environment rather than arriving with nursery stock. The differences in the species found in the ORIA compared with other mango growing regions could be due to the geographic isolation of the region.

REFERENCES

- Burgess TI, Barber PA, Hardy GESJ, 2005. *Botryosphaeria* spp. associated with eucalypts in Western Australia including description of *Fusicoccum macroclavatum* sp. nov. *Australasian Plant Pathology*. **34**: 557–567.
- Pavlic D, Barber PA, Hardy GESJ, Slippers B, Wingfield MJ, Burgess TI, 2008. Seven new species of the Botryosphaeriaceae discovered on baobabs and other native trees in Western Australia. *Mycologia*. **100**: 851–866.