

WHAT DO KOALAS AND FUNGI HAVE IN COMMON IN PRETORIA?

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Koalas and certain tree pathogens have in common the fact that they both choose to consume Eucalyptus trees or tree parts. Koalas and most Eucalyptus species originate from Australia. Koalas are entirely dependant on Eucalyptus leaves, they do not drink water and they obtain their required moisture and nutrition from a mixture of leaves from different *Eucalyptus* species. When four Koalas were presented to past South African President, Nelson Mandela, as a gift from the Australian Government, the correct species of Eucalyptus had to be planted near their new home at the Pretoria Zoological Gardens. This was to ensure that the animals had fresh Eucalyptus leaves on which to feed. The good news is that the food supply has been sufficiently adequate to ensure that the Koala family is flourishing: good evidence being the recent arrival of "Joey" Willie.



The Eucalyptus trees that are the source of leaves for the Pretoria Koalas are also a valuable resource for studying and understanding the fungi that are present on these species in South Africa. Eucalyptus trees are under constant attack by a number of fungal pathogens. Among the fungi present on Eucalyptus trees are the members of the Botryosphaeriaceae family. These are also known as opportunistic pathogens or saprophytes on dead or dying plant material. They are latent pathogens/endophytes that are known to invade the host plant tissue and they typically do not cause disease symptoms until the trees are predisposed, for example, by drought, hail damage or hot or cold winds.



Botryosphaeriaceae endophytes can be easily overlooked and can be transferred from one continent to the other through germplasm, vegetative materials or seeds. Not only do these fungi threaten the trees that have been grown for Koala food, but they also threaten South African commercial Eucalyptus plantations. In addition, this group of fungi also pose a great threat to the indigenous flora of South Africa. There is thus a need for a clear understanding of the ecology of these pathogens, the mode of transmission and spread as well as their correct taxonomic identification.



In our investigation of the “Koala trees” five species of *Botryosphaeriaceae* were identified and of all the five species, two species are new to science and have now been characterised and described. Pathogenicity tests conducted in green house trials show that one of the new species is the most pathogenic of the species found on these trees. This is a concern mainly because the *Botryosphaeriaceae* are also known to have the ability to jump hosts following introduction into new environments. Species-specific primers were designed for the *in-vivo* identification of the fungi. This provides a quick and reliable method of identification of the fungi and it can be used nationally as well as globally. This research conducted on the *Botryosphaeriaceae* infecting the “Koala” trees in Pretoria provides a basis for efforts to devise strategies to control and manage diseases caused by the *Botryosphaeriaceae*. In the meantime, every effort is being made to keep the “Koala” trees as healthy as possible in an environment that is somewhat stressed and where chemical control measures cannot be used due to the threat that the chemicals would pose to the Koala bears.