Summary

Fungal diseases of trees are serious impediments to forest expansion and productivity. While the adverse effects of diseases of non-native plantation forest trees are increasingly recognized in Africa, the health of native trees has been virtually ignored. This is especially acute as many commercially propagated trees are related to native woody plants and recurrent movement of pathogens between native and non-native trees is increasingly being recorded.

The genus *Terminalia* accommodates important indigenous tree species in Africa that provide a variety of valuable wood and non-wood products. Despite the importance of *Terminalia* spp., very little information has been recorded on their health problems. Research for this dissertation aimed at studying some of the fungal diseases of native and non-native *Terminalia* species in Africa. Special reference was provided to fungi in the Botryosphaeriaceae, a group of pathogens that infect host plants without always producing clear symptoms.

A literature review, presented in Chapter One, highlighted the limited information available on the pathogens and pests associated with these trees. Most disease reports include minimal detail. Often the causal agents had been identified based only on morphology and were not classified to the species level.

Studies performed in chapter two compared the assemblages of endophytic species of the Botryosphaeriaceae from *T. catappa* in Cameroon, South Africa and Madagascar. Five species were identified and two of these are new to science and provided with the names *N. batangarum* and *L. mahajangana*. The assemblage of the Botryosphaeriaceae varied from one country to another, however, colonization patterns in the three areas were similar. Greenhouse inoculation trials performed on young *T. catappa* trees showed variation among isolates tested, with *L. pseudotheobromae* being the most pathogenic.

Chapter three represents the first investigation of the Botryosphaeriaceae on native *Terminalia* trees in Cameroon and Africa. Morphological and DNA sequence data were used to identify these species as *L. theobromae, L. pseudotheobromae, L. parva* and *E. endophytica.*

Pathogenicity trials performed on young *T. mantaly* and *T. catappa* trees revealed that *L. pseudotheobromae* was the most virulent species.

In chapter four, species of Botryosphaeriaceae on native *Terminalia* spp. in Southern Africa were studied. Nine species were identified from *T. sericea* and *T. sambesiaca*. Seven of these, *L. crassispora, L. pseudotheobromae, D. alatafructa, P. olivaceum, N. parvum, N. kwambonambiense* and *N. vitifusiforme* represented previously described species and two, *L. cryptotheobromae* and *N. terminaliae,* were described as new.

The genetic analyses of populations of *L. theobromae* and *L. pseudotheobromae* presented in chapter five showed clear genetic divergence between *L. theobromae* and *L. pseudotheobromae* supporting their distinction as separate species. Both *L. theobromae* and *L. pseudotheobromae* populations possessed high gene diversity, moderate degrees of genotypic diversity, and high levels of gene flow between isolates from *T. cacao* and *Terminalia* spp. Both sexual and asexual modes of reproduction were found.

The last chapter of this dissertation presents the description of a new genus in the Cryphonectriaceae, *Aurifilum marmelostoma,* using a combination of molecular and morphological tools. This fungus is the second genus in this family described from *Terminalia* spp. Pathogenicity tests conducted to assess its ability to cause disease revealed that the fungus is a possible pathogen of this tree.

An extensive number of potentially pathogenic fungi, including five new species were found associated with native and non-native *Terminalia* spp. in Africa. As some of these fungal species could serve as sources of inoculum onto economically important crops, research presented in this dissertation provides a foundation for understanding health issues affecting *Terminalia* and related genera in selected regions in Africa. Hopefully, results of this study will serve as valuable tools in forestry management in Africa.