ECTOMYCORRHIZAS OF SOME AUSTRALIAN PLANTS

by

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DECLARATION

I hereby declare that this thesis contains no material which has been accepted for award of any other degree or diploma in any university. To the best of my knowledge and belief, no material described herein has been previously published or written by another person except when due reference is made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being available for loan and photocopying.

HARRY H. KOPE

27/4/84

DATE

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SUMMARY

The morphology and development of ectomycorrhizas formed by Peziza whitei, Labyrinthomyces sp. (Ascomycetes) and Laccaria ohiensis (Basidiomycete) on a range of hosts including Eucalyptus maculata (tree), Pultenaea obovata, Gompholobium latifolium (shrubs) and Poranthera microphylla, Angianthus tomentosus, Waitzia citrina and Stylidium graminifolium (herbs) have been studied in pure culture synthesis in a soil mix low in available phosphate.

The associations formed varied from mycorrhizas with well defined sheaths enclosing root apices on E. maculata, P. obovata and G. latifolium to less defined ones on the herbs where associations varied from partial sheathing of roots to discrete patches of fungal sheath to no sheath at all in the association A. tomentosus with P. whitei. A Hartig net was formed in most associations though Laccaria ohiensis formed an irregular one with E. maculata and none with P. microphylla, A. tomentosus and W. citrina. The results showed that the form of a mycorrhiza depended on both partners, not fungus or higher plant alone.

Compatability of some plant-fungus combinations was indicated by study of the development of mycorrhizas over time. A high percentage of roots of all orders became mycorrhizal and the percentage remained high as root numbers and orders increased.

All plant-fungus combinations, except A. tomentosus with L. ohiensis, showed a significant growth response compared with uninoculated plants which indicated mycorrhizal effectiveness, irrespective of mycorrhizal form, in the growth conditions employed.