

Ectomycorrhizal community ecology of *Eucalyptus delegatensis* forest: fire, understorey vegetation, health and nutrition.

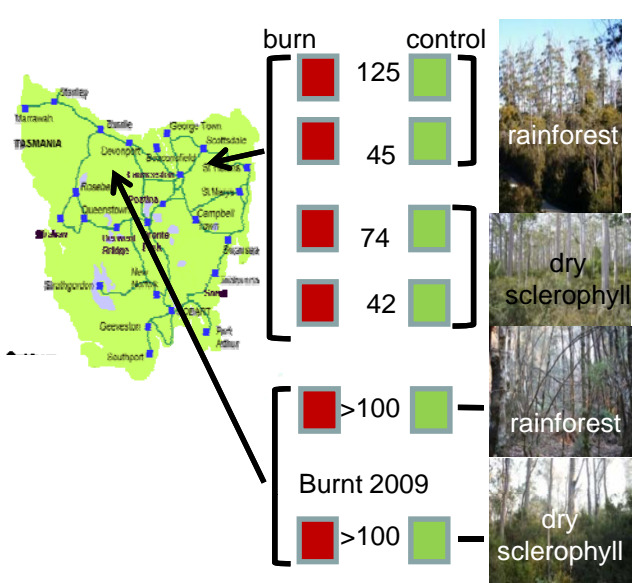
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Eucalypt dieback is ecologically complex and has been linked to changed management practices, especially altered fire regimes. Ectomycorrhizal fungi perform key ecosystem functions and are important for forest health.

The aim of this research is to explore the relationships between ectomycorrhizal fungi, fire and eucalypt dieback in forest with different understorey vegetation.

Experimental design



Methods

Mycorrhizal fungi were sampled via fruiting bodies, root tips, and soil, and were identified using morphology and DNA sequencing. Nutrient concentrations were determined from soil and foliage samples. Eucalypt dieback was determined using visual field based canopy health assessments.

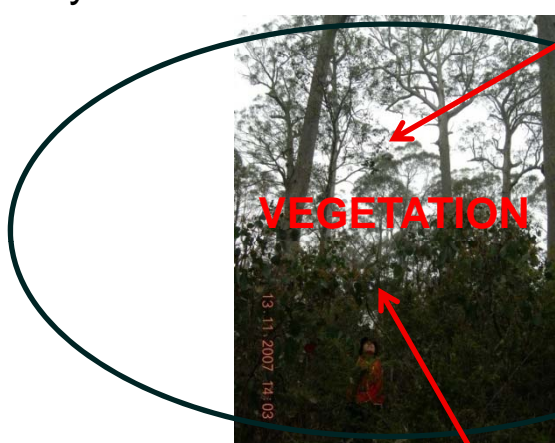
Results

Ectomycorrhizal fungi, soil chemistry, vegetation and fire all play a role in eucalypt dieback.

281 species of ectomycorrhizal fungi were sampled from *E. delegatensis* forest.

The most important nutrients in determining fungal composition were soil N, soil P and labile NO_3^- .

Dermoyce aff. *globuliformis* was more likely to be found in sclerophyll plots and *Cortinarius* aff. *sclerophyllum* was more likely to be found in rainforest plots.



Fungal community composition, soil chemistry and tree nutrition significantly differed between rainforest and sclerophyll understorey.

Fungal community composition significantly differed in moderate and severely declining forest.

Severely declining forest was associated with high levels of soil and foliage N, low levels of soil and foliage P and high levels of foliage Zn.

Zelleromyces spp. occurred in plots burnt <50 years ago and *Cortinarius rotundisporus* occurred in plots burnt >100 years ago.

With increasing time since fire pH and foliage P decreased and soil N:P increased.

