



DEAD WOOD MATTERS

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Introduction

Large dead wood on the forest floor, technically known as coarse woody debris (CWD), is an important component of forest structure. Ecological roles include the provision of food and shelter for saproxylic organisms, long-term nutrient storage and recycling of elements. Many species of fungi grow on and in CWD, facilitating the decomposition processes that release carbon and other elements back into the environment. Biofuel and charcoal production industries are a threat to the quantity, continuity and connectivity of CWD. Conservation of CWD to maintain and prevent loss of biodiversity should be a prime concern for forestry managers.



CWD after recent wildfire



Laetiporus portentosus

Aims

To map and classify the CWD according to size, state of decay, and bryophyte cover at each of four plots with different fire histories in a wet sclerophyll forest dominated by *Eucalyptus obliqua*.

To record the macrofungal fruiting bodies found on the CWD and other substrates: soil, litter, fine woody debris, and living wood.

To investigate the associations between macrofungal assemblages and substrate, and to compare the results from the four plots.



Ascocoryne sarcoides

Methods

Four 50x50m plots (Old growth, burnt in 1898, burnt in 1934, and burnt both in 1898 and 1934) were chosen in natural forest at the Warra LTER site, Tasmania. CWD ($\geq 1.0\text{m}$ in length and $\geq 10\text{cm}$ in diameter) in each plot was mapped. Wood diameter, volume, decay class and bryophyte cover were recorded for each piece of CWD.

Macrofungal surveying of all substrates in each plot was carried out at fortnightly intervals for 15 months between April 2006 and July 2007.

Statistical analyses for CWD data included linear regression and graphs of number of pieces and volumes of CWD versus decay class, diameter class and percent bryophyte cover.

The macrofungal data were analysed using canonical analysis of principal coordinates (CAP).

Fungal species accumulation data were modelled to determine predicted species richness.

Results

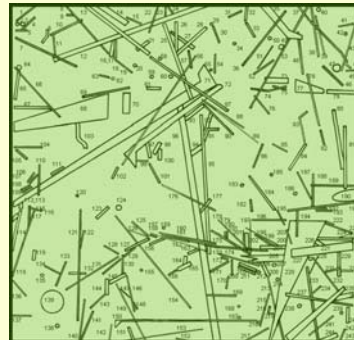


Fig. 1. Map of CWD, 1934 plot

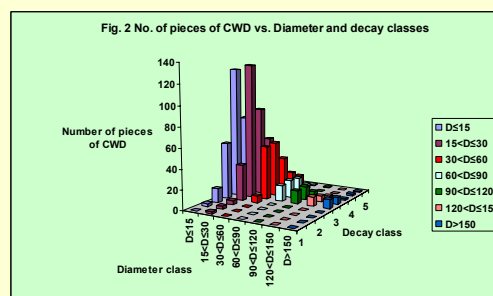


Fig. 2. CWD pieces vs. Diameter and Decay class, all plots combined

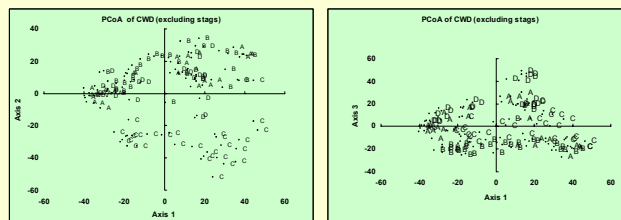


Fig. 3. PCoA (metric multi-dimensional scaling) of CWD (excluding stags), plots randomly labelled, first three axes shown

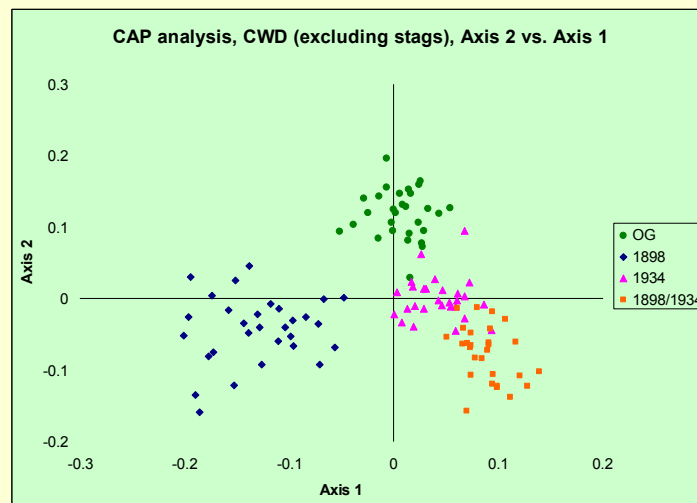


Fig. 4. CAP diagram for CWD

Original group:	Classified into groups:				Total	%correct
	Old growth	1898	1934	1898/1934		
Old growth	28	0	1	0	29	96.6%
1898	0	29	1	0	30	96.7%
1934	1	0	26	1	28	92.9%
1898/1934	0	0	2	26	28	92.9%

Table 1. Classification table for CWD, 296 macrofungal species (misclassifications shown in red)

Length of CWD	Number of pieces of CWD	Mean fungal species/CWD \pm s.e.
Short ($L \leq 2.5\text{m}$)	317	1.38 \pm 0.093
Medium ($2.5 < L \leq 5\text{m}$)	271	1.83 \pm 0.117
Long ($L > 5\text{m}$)	226	4.51 \pm 0.338

Table 2. Mean fungal species /CWD vs. Length class

Surface area	Number of pieces of CWD	Mean fungal species/CWD \pm s.e.
Small ($A \leq 1.5\text{m}^2$)	285	1.47 \pm 0.096
Medium ($1.5 < A \leq 3.5\text{m}^2$)	271	2.01 \pm 0.142
Large ($A > 3.5\text{m}^2$)	258	3.84 \pm 0.302

Table 3. Mean fungal species /CWD vs. Surface area



CWD in the Old growth plot, 200-300 years after wildfire.

Substrate	Fungi records (16489)	Fungi species (850)
CWD	3842	296
Other wood	3443	251
Stags	491	64
All wood	7776	411
Soil	5706	495
Litter	3007	146

Table 4. Records of fungi species on different substrates



A corticioid fungus, *Phlebia* sp., covering the underside of a log.

Conclusions

- Forests of different ages support a different mycota.
- There are as many fungal species supported by other wood as by CWD; however, the species lists, although overlapping, are not the same.
- CWD of greater length or of greater surface area support more species of macrofungi.
- Some fungal species have been identified as being faithful to a particular CWD diameter, CWD decay class or forest type, e.g. *Australoporus tasmanicus*, *Fomes hemitephrus*.
- CWD in different decay stages and of different lengths and diameters are important in maintaining species richness and preserving biodiversity.



Mycorrhizal fungus supported by CWD

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