

Survey of subterranean termites (Isoptera: Rhinotermitidae) in a managed silvicultural plantation in Portugal, using a line-intersection method (LIS)

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Abstract

Subterranean termites (*Reticulitermes grassei*) were surveyed over successive seasons in a managed eucalyptus plantation in southeastern Portugal for 26 months. Termite activity in seven diameter categories of lying dead wood was investigated by a modified line intersection method (LIS). Each item sampled was inspected and assessed for termite attack and for general (i.e. fungal) decay status using standard protocols. Line intersection is quantitative to the extent that it can link foraging and decay parameters to woody biovolume. It was found that termites selected items with larger diameter, the observed trend showing an exponential character with greater termite attack as diameter increased. Attack by termites was positively associated with prior decay by fungi. A clear positive relationship was shown between rainfall and total woody biovolume containing live termites, underlining the importance of moisture for termite activity. Subterranean termites appeared to be important wood decomposers in the woodland studied, with an average of 30% of lying dead wood branches showing signs of termite attack.

Keywords: *Reticulitermes grassei*, forest, wood decomposition, wood decay, termite attack

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Introduction

The known habitats of termites range from dry deserts, steppes, prairies and Mediterranean scrublands to the wettest tropical forests, with differing assemblages characteristic of each habitat (Bignell & Eggleton, 2000). It is generally known that termites play an important role in forest ecosystems as mediators of many soil ecological processes (e.g. Lee & Wood, 1971; Pearce, 1997; Bignell &

Eggleton, 2000), although fully quantitative studies of their direct contribution to decomposition are few.

The majority of studies on the ecological importance of termites are focused on tropical forests and savannas, where functional diversity patterns and the influence of environmental factors on assemblages have been extensively analysed (e.g. Bignell *et al.*, 1997; Eggleton & Tayasu, 2001; Eggleton *et al.*, 2002; Davies *et al.*, 2003; Jones *et al.*, 2003) and where the impact of termites in the ecosystem is acknowledged as substantial (Wood & Sands, 1978; Bignell, 2006). In warm temperate and subtropical biomes, termite diversity is much lower, but an impact in forest systems is still apparent. However, it has not been assessed quantitatively. In the temperate forests of southern Europe, *Reticulitermes*, the

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