

Workshop: Pollutant degradation: hidden microbial potential in nature to combat pollutants

Potential of persistent ectomycorrhizal fungi in fire impacted soil to degrade fluorinated pollutants

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The use of retardants and other agrochemical products (ie. fluorinated organic compounds) on forest fires may have a significant negative effect, on soil properties and contaminate other natural resources, urging the need for the development and implementation of new forestry practices. The purpose of this study was to assess the potential contribution of ectomycorrhizal fungi as a rhizosphere remediation technology. The persistence of selected ECM fungi has been monitored on a 5 yr old *Pinus pinaster* plantation, in a repeated fire-burned forest area. The successful introduction of nursery grown seedlings inoculated with ectomycorrhizal fungi was achieved, reinforcing the ability of ectomycorrhizal fungi to mitigate stress factors. Community analysis showed that *Pisolithus tinctorius* was among the most persistent fungi and, as such, its capacity to tolerate and/or degrade mono-fluorinated organic compounds was evaluated. *P. tinctorius* was able to metabolise the fluorinated compounds, possibly by activating a related pathway to the lignin-degradation. Catechol and fluorocatechol were identified as fungal intermediates and the presence of specific enzymes (ie. laccase, peroxidase, tyrosinase) were also detected on solid and liquid extracts. The identification of other degradation products is on-going. The results from

this study enhance the role ectomycorrhizal fungi play in the degradation of pollutants in disturbed sites, as new biotechnology tools. This work was supported by the FCT Project -PTDC-AGR-CFL-111583-2009.

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