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Solutes released from leaf litter (Quercus suber, Quercus robur, Pinus pinea) exposed to Diferent fire intensities in a laboratory experiment

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After a fire, the ash produced by the combustion of the vegetation is very rich in available nutrients. Different fire intensities have different impacts on the type of ash generated and thereafter in their chemical composition. The aim of this work is to analyse the characteristics of the slurry produced by mixing water and ash generated from three Mediterranean species heated for a period of 2 hours at 150, 200, 250, 300, 350, 400, 450, 500, 550žC - pH and electrical conductivity, minor elements (Fe, Mn, Al and Zn), major elements (Ca, Mg and Na) and other components, SiO2 and P2O5. Results show that pH is stable at low temperatures, except for a small decrease at 300žC, and the electrical conductivity increased slightly. At 350žC both parameters increased, mainly in the ash of Pinus pinea. The minor elements have high values of solubilization at low temperatures and pH. The dissolution of the heavy metals is quite variable from species to species. Major changes are noted in the leaf litter of Pinus pinea (mainly in Mn) and Quercus suber (Al). All other components show no clear trend. In general, the major elements in all species, have high levels of solubilization at 350-450žC in a high pH environment, and showed an abrupt decrease at higher temperatures. The main impacts are noted in Pinus pinea in the monovalent and divalent cations, and results for the minor elements, demonstrated important differences between species.The SiO2 shows a behavior similar to the major elements, but the rate of decrease of the dissoloution is not as abrupt. The major impact of increasing

temperatures is found in the leaf litter of Quercus robur. Similar to Ca, the P2O5 has higher rates of solubilization at 350žC, decreasing drastically at higher temperatures for the Pinus pinea and Quercus robur, and at 450žC for Quercus suber. It is in this species that the impacts of higher temperatures are more evident. The reduction in the dissolution after 400-450žC may be related to the creation of insoluble components of CaCO3, found in all the ashes at 400žC that affects all chemical components in different ways. Their effect is more visible in major elements, SiO2 and P2O5 and less in minor elements. The impact of the CaCO3 on the solubilization of the chemical components is more evident in the ashes generated by Pinus pinea.