



## Fire severity effects on ash extractable Total Phosphorous

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Phosphorous (P) is a crucial element to plant nutrition and limits vegetal production. The amounts of P in soil are lower and great part of this nutrient is absorbed or precipitated. It is well known that fire has important implications on P cycle, that can be lost throughout volatilization, evacuated with the smoke, but also more available to transport after organic matter mineralization imposed by the fire. The release of P depends on ash pH and their chemical and physical characteristics. Fire temperatures impose different severities, according to the specie affected and contact time. Fire severity is often evaluated by ash colour and this is a low-cost and excellent methodology to assess the fire effects on ecosystems. The aim of this work is study the ash properties physical and chemical properties on ash extractable Total Phosphorous (TP), collected in three wildfires, occurred in Portugal, (named, (1) Quinta do Conde, (2) Quinta da Areia and (3) Casal do Sapo) composed mainly by *Quercus suber* and *Pinus pinaster* trees. The ash colour was assessed using the Munsell color chart. From all three plots we analyzed a total of 102 ash samples and we identified 5 different ash colours, ordered in an increasing order of severity, Very Dark Brown, Black, Dark Grey, Very Dark Grey and Light Grey. In order to observe significant differences between extractable TP and ash colours, we applied an ANOVA One Way test, and considered the differences significant at a  $p < 0.05$ . The results showed that significant differences in the extractable TP among the different ash colours. Hence, to identify specific differences between each ash colour, we applied a post-hoc Fisher LSD test, significant at a  $p < 0.05$ . The results obtained showed significant differences between the extractable TP from Very dark Brown and Black ash, produced at lower severities, in relation to Dark Grey, Very Dark Grey and Light Grey ash, generated at higher severities. The means of the first group were higher than the observed in the second one. This indicates that ash produced lower temperatures release in solution higher amounts of TP. These divergences occur due temperature of combustion, affected specie, ash pH values and  $\text{CaCO}_3$  content, which affects the quantity of this element in solution. Discussions about these effects will be accurate in the communication.