

## A PLAGUE OF FIRES IN THE NW OF IBERIAN PENINSULA: THE SCAVENGING EFFECT OF RAIN ON AIR QUALITY

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Keywords: air quality, EC, levoglucosan, OC, particulate matter, rain.

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One of the major problems that concerns human health and climate in the Mediterranean area is air pollution. Forest fires present a great influence therein. An example is the set of fires that occurred in the North of Spain (Galicia, Asturias and León) and the North of Portugal in October 2017. Between 14 and 16 October, more than 100,000 ha were burned, and the plumes reached several cities of the northwestern Iberian Peninsula, including León. Thus, the aim of this study is to present the main results of the chemical analysis of air filters and rain collected during this period.

The sampling campaign was carried out at the campus of the University of León (Spain) between 16 and 18 October 2017. During this period, two rain events took place, on 16 and 17 October, with 0.84 and 4.84 mm of rain, respectively. Several sampling instruments were used: i) a High-Volume Air Collector, CAV-A/Mb model equipped with 150 mm diameter quartz filters; ii) a Low Volume Collector TECORA ECHOPM that operates with 47 mm diameter Teflon filters; iii) an automatic wet-only collector Eigenbrodt model UNS130/E.

The gravimetric quantification of PM<sub>10</sub> quartz filters was made using an electronic microbalance (Mettler Toledo, XPE105DR). Filters were analyzed by different analytical techniques: i) a thermal-optical technique (Pio et al., 2011) for the determination of elemental and organic carbon; ii) ion chromatography for the quantification of water-soluble inorganic ions; iii) PIXE (Particle-Induced X-ray Emission), following the methodology described by Lucarelli et al. (2015), for the determination of the major trace elements; iv) gas chromatography-mass spectrometry (GC-MS) for organic speciation, including polycyclic aromatic hydrocarbons (PAH) and aliphatics. Furthermore, the mannosan and levoglucosan concentrations were also obtained. In rain samples, the

dissolved organic carbon (DOC) content has been obtained by combustion and infrared detection in a Total Organic Carbon Analyzer from Shimadzu (TOC-VCPH).

The maximum hourly PM<sub>10</sub> concentration registered during wildfires was 100.6  $\mu\text{g m}^{-3}$ , whilst before the event the mean daily PM<sub>10</sub> concentration was 13.9  $\mu\text{g m}^{-3}$ . After rainfall, the rain scavenging caused a decrease of PM<sub>10</sub> concentration of 42 %. The maximum total carbon concentration registered by thermal-optical technique was 4.9  $\mu\text{g m}^{-3}$  with an OC/EC ratio of 5.6. Levoglucosan concentrations were 100 and 137 ng m<sup>-3</sup>, before and after rainfall, respectively.

This study complements a previous work already presented (Blanco-Alegre et al., 2018) on the physical properties of aerosols and precipitation in this sampling campaign.

This work was partially supported by the Grant TEC2014-57821-R, the University of León (Programa Propio 2015/00054/001) and the Grant CGL2014-52556-R. C. del Blanco Alegre acknowledges the grant FPU16/05764 from the Spanish Ministry of Education.

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