

Airborne pollen in Cáceres (SW Spain)

A. Monroy-Colín¹, E. Moreno-Paredes¹, J. Chaparro-Morán¹, S. Fernández-Rodríguez², J. M. Maya-Manzano¹, R. Tormo-Molina¹

¹Plant Biology, University of Extremadura, Badajoz, Spain; ²Construction, University of Extremadura, Cáceres, Spain

Introduction: The city of Cáceres is located in the SW of Spain, being the second in Extremadura region in relation to population (c. 95 000 inhabitants). Surrounding landscapes are dominated by oaks agro-sylvo-pastoral systems (dehesas) and cereal dry crops under Mediterranean climate. The aim of this study is provide general aerobiological data about the main airborne particles and related it with pollen sources distribution and meteorology.

Material and Methods: Airborne particles were captured using volumetric spore trap (Hirst) located at the School of Technology building at the University of Extremadura, on a third floor terrace. Period of sampling was from October 2014 to September 2015. A meteorological station was located close (3 m) to the spore trap. Main airborne particle analysed includes pollen from trees (*Acacia*, *Alnus*, *Betula*, *Casuarina*, *Castanea*, *Cupressaceae*, *Corylus*, *Erica*, *Eucalyptus*, *Fraxinus*, *Morus*, *Olea*, *Arecaceae*, *Pinaceae*, *Platanus*, *Populus*, *Quercus*, *Salix*, *Ulmus*) and from herbaceous plants (*Amaranthaceae*, *Apiaceae*, *Brassicaceae*, *Asteraceae* -3 types-, *Echium*, *Plantago*, *Poaceae*, *Rumex*, *Typha*, *Urticaceae*).

Results: Average meteorological values for the period of study were 17.3 °C and 314.3 mm of rain. Temperature was 1 degree higher than normal values (16.3°C) and rain represented only 57% in relation to normal values (551 mm). Winter was colder and dryer and Spring hotter both than normal values. For pollen from trees April was the month with the highest pollen concentrations, being *Quercus* the most abundant pollen in the air and secondly *Plantago* and *Rumex*. May was the second month in relevance, pollen from *Olea*, *Pinaceae*, *Poaceae*, *Rumex*, *Plantago* and also *Quercus* were the responsible for that values. *Cupressaceae* pollen appeared from October to April, autumn sources included junipers from natural vegetation and winter sources are ornamentals cypresses and related species.

Conclusions: Airborne pollen from trees in Cáceres were dominated by *Quercus* species from spontaneous vegetation, firstly *Quercus ilex* subsp. *ballota* and secondly *Q. suber*, *Q. pyrenaica*, *Q. coccinea* and *Q. faginea*. Olive crops close to the city are responsible for the *Olea* airborne pollen, the second in importance. Ornamental *Cupressaceae* (mainly *Cupressus* and *Platycladus*) and spontaneous *Juniperus* represent the third airborne pollen from trees. A dry winter and a hot spring influenced the seasonal pattern of aerobiological representation in the period studied. From herbaceous sources grass family play the first place and secondly plantains and sorrels, all of the mainly in spring (April and May).

Keywords: aerobiology, seasonal pattern, pollen sources.