

P.057 | Influence of weather types and meteorological conditions on pollen concentration in NW Spain

F. Oduber¹, C. Blanco-Alegre¹, A.I. Calvo¹, A. Castro¹, D. Fernández-González^{2,3}, R.M. Valencia-Barrera², A.M. Vega-Maray², A. Rodríguez-Fernández² and R. Fraile¹

¹ Department of Physics (IMARENAB), University of León, León, Spain.

² Department of Biodiversity and Environmental Management, University of León, León, Spain.

³ Institute of Atmospheric Sciences and Climate, National Research Council, Bologna, Italy.

Presenting author email: delia.fernandez@unileon.es

Keywords: pollen, circulation weather types, meteorology

BACKGROUND AND OBJECTIVES

Meteorological conditions influence the atmospheric processes of dilution, transport and elimination of bioaerosols. The concentration of bioaerosols in the atmosphere is also linked to the occurrence of specific weather characteristics (including wind speed and velocity) induced by mesoscale processes. Thus, the main objective of this study is to analyze the concentration of 20 pollen types under different circulation weather types (CWT) and the relationship with the meteorological conditions.

MATERIALS AND METHODS

The sampling campaign was carried out between 2012 and 2018 in León (Spain). Pollen was collected by a volumetric *Hirst* type spore-trap and quantified by optical microscopy. A CWT classification, based on Lamb (1972), was carried out according to the following notation: C (cyclonic) or A (anticyclonic) followed by the cardinal point. In addition, a weather station recorded meteorological variables.

RESULTS

The cyclonic easterly weather type, CE, has the highest total daily pollen concentration (163 pollen m⁻³), followed by easterly, E, and cyclonic northwesterly, CNW (95 and 93 pollen m⁻³, respectively). The occurrence of these CWT is less than 5% of the total sample days, and the frequency is higher during spring. *Platanus*, *Populus* and *Quercus* showed the highest concentration in these weather types. Days with these CWTs are characterized by low precipitation (mean of 0.1 mm day⁻¹ for CE and E, and 5.1 mm day⁻¹ for CNW), by mean temperatures of about 12 °C and relative humidity of 54% (CE, E) and 70% (CNW). The lowest total pollen concentration was recorded in the cyclonic southerly type, CS (4.7 pollen m⁻³). *Cupressaceae* shows the highest concentration during these days. This CWT is more frequent in autumn (65% of the days) and is characterized by a precipitation of 1.1 mm day⁻¹, a mean temperature of 10.4 °C and a relative humidity of 78%.

CONCLUSIONS

The knowledge of weather types and meteorological conditions could be a helpful tool for daily pollen forecast and trend analysis.

COMMENTS

This work was partially supported by the Spanish Ministry of Economy and Competitiveness (Grant TEC2014-57821-R), the University of León (Programa Propio 2015/00054/001) and the AERORAIN project (Ministry of Economy and Competitiveness, Grant CGL2014-52556-R, co-financed with FEDER funds). F. Oduber acknowledges the grant BES-2015-074473 from the Spanish Ministry of Economy and Competitiveness. C. del Blanco Alegre acknowledges the grant FPU16/05764 from the Spanish Ministry of Education. The authors are grateful to the Health Department of the Castilla and León Government for funding the RACYL.

ID: 079

Session: FORECASTING AND BASIC AEROBIOLOGY

Topic: FORECASTING AND MODELING