Introduction

Since December 2016, the Aerobiology research team of the University of Malaga has been sampling and studying the atmospheric pollen content in Ronda, the biggest city in the northwest of Malaga province (South Spain). Ronda is located in a rural area close to the Natural Parks ‘Sierra de Grazalema’ and ‘Sierra de las Nieves’, surrounded by crops, natural and seminatural vegetation. The Genal Valley, which is located at the southwest of Ronda, is the biggest Castanea sativa Mill. crop area in Southern Spain but there are also others C. sativa crops in different areas close to Ronda. This increases the Castanea atmospheric pollen levels in Ronda, the highest in Malaga province. Castanea pollen has been cited by different authors as potentially allergic (Halse, 1984). Moreover, its cross-reactivity with Quercus, Betula and Corylus pollen has been proved (Ickovic & Thibaudon, 1991). The objective of this preliminary study was to determine the main sources of Castanea pollen detected in Ronda during the period in which the highest concentrations were detected along the year 2017.

Material and Methods

The pollen samplings were made by means of a Hirst-type volumetric pollen trap (Hirst, 1952) placed on the roof of the ‘Pérez de Guzmán’ High School (Ronda, 36°44’N, 5°10’W, 751m a.s.l.). The samples obtained were mounted and counted according to the methodology proposed by the Spanish Aerobiology Network (REA) (Galán et al., 2007). Backward air trajectories were calculated according to HYSPLIT 4 model at 750m above ground level (Stein et al., 2015; Rolph et al., 2017). Meteorological data were obtained from the US National Oceanic and Atmospheric Administration (NOAA). Models were elaborated five times a day by using R software for the whole month of June 2017. Cluster analysis correlations were provided by the Meteorology Statal Agency (AEMET) and were recorded at ‘Ronda-Pérez de Guzmán High School’s station. Spearman correlation tests were chosen. Spearman correlations were done with the daily values of June 2017. The meteorological data used for the correlations were provided by the Meteorology Statal Agency (AEMET) and were recorded at ‘Ronda-Pérez de Guzmán High School’ station.

Results

Conclusions

• The dominant air trajectories during the studied period came from the southeast of Ronda and passed over the Castanea crops located in Istan and Ojen bringing large amounts of pollen from these places.
• Very high Castanea pollen levels were detected in Ronda. In the days in which relative maximums of Castanea pollen were found, the air masses passed over these Castanea crops instead of the bigger ones located in the Genal Valley.
• Despite some of the Castanea pollen oscillations observed can be explained by changes in the air trajectory, some of the variations are also explained by changes in the meteorological variables.
• Since no significant correlations were found between Castanea pollen levels and wind speed and calm frequency, Castanea pollen should come from short distance.
• Predictive models for Castanea pollen in Ronda should take into account the backward air trajectory in future researches in order to prevent allergic diseases in population.
• Cross pollination events between Castanea populations in the area can be estimated in future researches by studying air trajectory models.

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