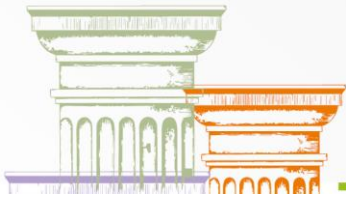


ABSTRACT FORM



Scientific sessions: Aerobiologia Inquinamento e Cambiamento Climatico

Global warming advances the flowering of plane tree in Malaga (southern Spain)

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Introduction

Temperature has been identified as one of the most influent meteorological variable in bud development and pollen release in many arboreal taxa (Geng et al. 2022). Consequently, global warming is affecting the flowering phenology of many species (Menzel et al. 2020). These changes have special relevance in the case of ornamental trees that produce highly allergenic pollen grains such as *Platanus orientalis* L. s.l., given that variations in the temporality of its Main Pollen Season (MPS) can affect the sensitive people living in cities (Lara et al. 2020). The aim of this study is to detect whether or not there is any significant trend in the main parameters of production and temporality of airborne *Platanus* pollen in Malaga, as well as to identify the possible causes.

Materials and Methods

Daily airborne pollen concentrations of *Platanus* were analysed for the period 1992-2021 in Malaga (southern Spain). 7-days moving means were calculated and the MPS was defined as the period between the first and last day of the year whose moving mean exceeded 3 pollen grains/m³, the *AeRobiology* R package being used (Rojo et al. 2019). Trends were calculated for both pollen and meteorological parameters. The thermal requirements of *Platanus* flowering were analysed by means of the *ChillR* R package, applying three different models for chilling (Utah Model, Chilling Hours and Chill Portions), as well as the Growing Degree Hours for forcing. The relevant periods for chilling and forcing accumulation were defined according to Partial Least Squares (PLS) regression analyses (Luedeling 2021).

Results and Discussion

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There was a significant advance in the start of the MPS of *Platanus* pollen (2.5 days/decade) caused by a temperature increase during the period prior to flowering. This phenological trend has become more pronounced since 2011 (9 days/decade). Despite there was not any significant trend detected for the chilling accumulation during the months of November and December, the global warming is increasing the forcing accumulation during January and February, so the forcing requirements of *Platanus* flowering are reached earlier and the phenophase advances. In line with these findings, the relevant dates for the chilling and forcing accumulations have advanced up to one month since 1992 according to the PLS analysis.

Conclusions

Global warming has advanced the period of favourable temperatures for the forcing requirements of *Platanus*, so they are reached earlier and the flowering period advances.

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