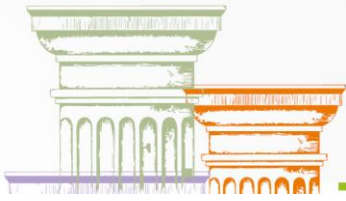


ABSTRACT FORM



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Comparative study of intradiurnal variations of airborne pollen in the city centre and on the outskirts of Malaga city (southern Spain)

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Introduction

Airborne pollen is one of the main causative agents of allergic rhinitis in cities all over the world (Buters *et al.*, 2018). Pollen concentrations may vary throughout the day, not being equal in all the points of the city, due these concentrations are influenced by the presence of nearby pollen emission sources. Knowledge about the influence of these sources is of great interest for allergy sufferers when planning outdoor activities, especially in high populated and tourist cities such as Malaga (southern Spain).

The aim of this study was to analyse the intradiurnal variation patterns of the airborne pollen concentration both in the city centre and on the outskirts of Malaga as well as quantify the detected differences and establish the influence of the pollen emission sources present in the nearby areas.

Materials and Methods

The aerobiological data were obtained by means of two Hirst-type volumetric pollen trap (Hirst 1952). One of them installed on the rooftop of the Faculty of Sciences, University of Malaga (outskirts) and the other in the city centre. The study was carried out during the years 2017-2019, the most relevant pollen types being considered (those which represented more than 1% of the total pollen integral). The countings have been done hourly, considering only days without rainfall with a daily mean pollen concentration equal or greater than the mean of the main pollen season (MPS) (Galán *et al.*, 1991). Next, accumulated values of every two hours, expressed as percentages over the daily total, were calculated in order to study and compare the intradiurnal patterns.

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Results and Discussion

Despite the two sampling points are only 5 km apart, notable variations were detected in the intradiurnal patterns of some pollen types, while others showed similar behaviour. In the case of *Casuarina*, a very high peak was recorded in the outskirts while a more even daily distribution was noted in the city centre. This could be due to the vicinity of parks and gardens with ornamental *Casuarina* trees in the outskirts, which causes a pollen liberation that is directly reflected in the intradiurnal pattern. On the other hand, there are not as many *Casuarina* trees in the city centre, and the pollen recorded by the trap comes from more distant areas, making the pollen detected more homogeneously distributed. *Pinus* pollen shows similar circumstances since there are small woods near the outskirts sampling point, while the city centre has the nearest pine forests a bit further. The opposite was observed in the case of *Parietaria*: there was a pronounced peak in the city centre where the *Parietaria* sources are more abundant given the number of abandoned plots, the registers being more diffuse in the outskirts. However, for other pollen types, the intradiurnal patterns were similar in both sampling sites, such as for the *Quercus*, probably due to there are no nearby pollen sources that could specifically affect one or another sampling point.

Conclusions

The intradiurnal patterns of the pollen types studied were different between sampling points within the same city because of the location of the nearby pollen emission sources. This reflects the need to conduct aerobiological sampling in several points of a same city in order to obtain more precise and useful information for the allergic population.

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