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S1 P02

Atmospheric pollen dynamics in Malaga (S Spain) during 2013-2014. Seasonal trends

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Mediterranean Palynology - 2015 "GPSBI - APLE Symposium"

Andalucía Tech Campus de Excelencia Internacional

Red Española de Aerobiología

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INTRODUCTION

In this work we present the atmospheric pollen results obtained in Malaga, a coastal Mediterranean city situated in southern Spain, throughout years 2013 and 2014. The main objective is to compare the results obtained these years with those registered during the 21 previous years (1992-2012) and detect possible significant trends.

METHODOLOGY

Air sampling was carried out with the aid of a 7-day recording volumetric spore trap (Hirst, 1952). Pollen grains were counted according to the methodology proposed by the Spanish Aerobiology Network, REA (Domínguez et al. 1991, Galán et al. 2007).

To establish the principal main pollen season (MPS) the method proposed by Nilsson and Persson (1981) was used (90% of the total annual for Gramineae and 95% for Quercus). To characterize the phenological behaviour of the atmospheric pollen, the dates of the beginning and end of the MPS and its duration in days (from 1st January) were used. The annual pollen count (pollen index, PI) has been used as indicator of pollen severity.

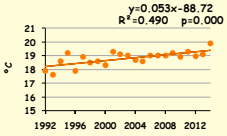
The meteorological data used were annual mean temperature (ºC), total rainfall (mm) and relative humidity (%). The meteorological data were supplied by AEM.

The pollen and meteorological data were fitted to a simple linear regression line to observe trends. The slopes of the regression equations, the determination coefficients (R^2) and significance levels (p) have been studied. It has been only considers as significant the regression lines whose fitted points as determined from the R^2 value, showed a p value of ≤0.05. The SPSS Statistics software was used in all analysis.

RESULTS

Trends of meteorological data

Annual Mean Temperature

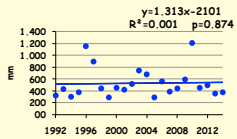


Increase by 0.05°C per year

Significant trend

Last two years: warm

Annual Total Rainfall

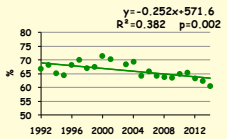


Fluctuate year by year

No significant trend

Last two years: drought

Annual Relative Humidity



Decreased by 0.25% per year

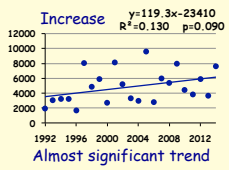
Significant trend

Last two years: dry

Trends of pollen data

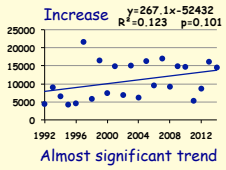
Severity or Pollen Index (PI)

Quercus



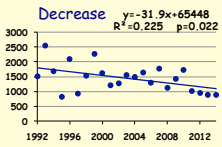
Almost significant trend

Olea



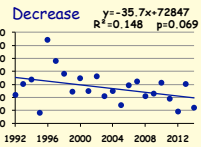
Almost significant trend

Chenopodiaceae



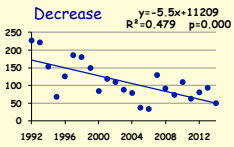
Significant trend

Plantago



Almost significant trend

Cyperaceae

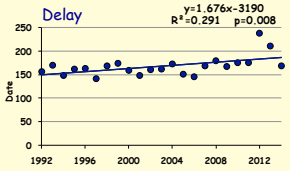


Significant trend

Phenology or Main Pollen Season (MPS)

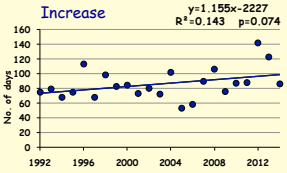
Quercus

End



Significant trend

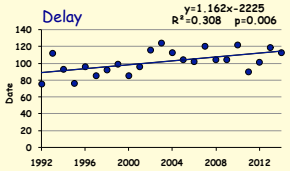
Duration



Almost significant trend

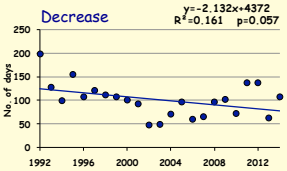
Gramineae

Start



Significant trend

Duration



Almost significant trend

CONCLUSIONS

- The trend to increase the annual pollen index of Quercus has already been observed in a previous study (until 2012) whose results have been presented in other congress (Recio et al., 2013). We calculated correlations and think that in the south of the Iberian Peninsula there is a tendency to diminish the relative humidity that in autumn could favour the induction of a greater number of floral buds and, therefore, to produce more future pollen grains during the spring that will be released to the air. Also we observed that the trend to delay the date of end and to increase the duration of Quercus main pollen season in Malaga is caused by tendency to diminish the relative humidity and to increase the temperature (during previous autumn and winter).

-The almost significant trend to increase the annual pollen index of Olea can be caused by alternance in the harvest (2013 and 2014 were high production years). Also it could be caused by an increase of its crops.

-The trend to decrease the annual pollen index of Chenopodiaceae, Plantago and Cyperaceae (weeds) may be caused by a change of land use (urbanisations, gardens, roads…) that have left less space for wild plants.

- The Gramineae phenology behaviour support the conclusions published in Recio et al. (2010): The trend to decrease the duration of Gramineae main pollen season in Malaga may be caused by the tendency to increase spring temperature, leading plants to wilting and parching. The increased rainfall of early spring may be associated with the tendency of pollination to start later.

This work has been funded with the aid of the University of Malaga, Campus of Excellence, Andalusia Tech.

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