

# Airborne Cupressaceae pollen in Badajoz (SW Spain)



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## Introduction

Airborne Cupressaceae pollens are present in the atmosphere of Badajoz mainly in winter, and in urban environment their main source are ornamental trees. Although their presence could depend on meteorological parameters, artificial conditions of growing may disturb their analysis. The aim of this work is to show airborne pollen data for Cupressaceae from a city in the SW of Spain and analyze their relation with meteorological parameters and phenology of pollination of the five species used as ornamental with different frequency: *Cupressus arizonica* (20%), *C. macrocarpa* (5%), *C. sempervirens* (44%), *Calocedrus decurrens* (3%) and *Platycladus orientalis* (28%) (Fig. 1).



Fig 1. Images of microestrobiles of *Cupressus arizonica*, *Platycladus orientalis* and *Calocedrus decurrens*.

## Results

Cupressaceae main pollen season lasted on average 55 days, ranging from 30 to 98 days, from 24<sup>th</sup> January to 19<sup>th</sup> March. Statistically positive significant correlation was found comparing years and days of maximum peak and ending days of the main pollen season (Fig. 2).

Average pollen concentration was 65 grains/m<sup>3</sup>, with a range of 17-157 grains/m<sup>3</sup>. Average peak of concentration reached 569 grains/m<sup>3</sup> (137-1079) on 25<sup>th</sup> February (Fig. 3).

There is no correlation between annual mean average concentration with temperature and rains, even considering data of previous year (Fig. 4).

Average phenology of Cupressaceae results that *Cupressus sempervirens* pollinate mainly on February, whereas *Cupressus macrocarpa*, *C. arizonica* and *Calocedrus decurrens* do mainly on January, and *Platycladus orientalis* between January and February (Fig. 5).

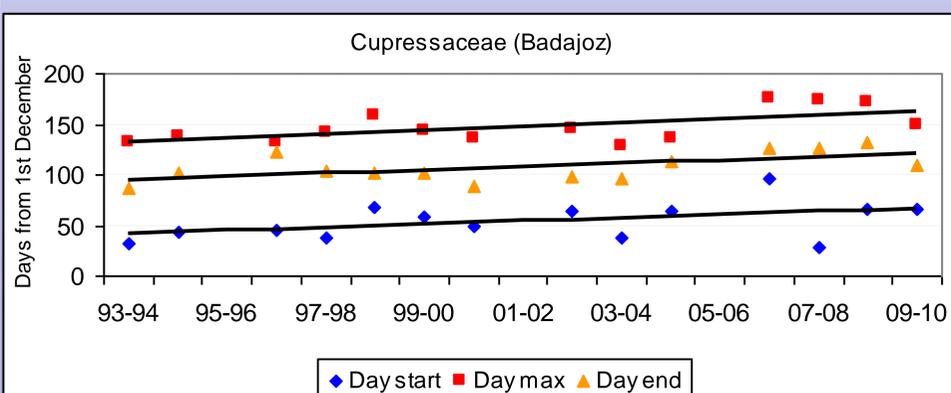


Fig 2. Trend in pollen season for Cupressaceae pollen in Badajoz.

## Material and Methods

Aerobiological sampling was taken from 1993 to 2010 in Badajoz (SW Spain) using a seven day Burkard spore trap. Sampler was located at the terrace of an one-floor building. A total of 14 winter periods were analyzed as in three winters the spore trap did not work continuously. Main pollen seasons were calculated using 5-95% range of data and beginning on the first of December. Meteorological parameters of temperature and rain were taken into account to find any possible relationship.

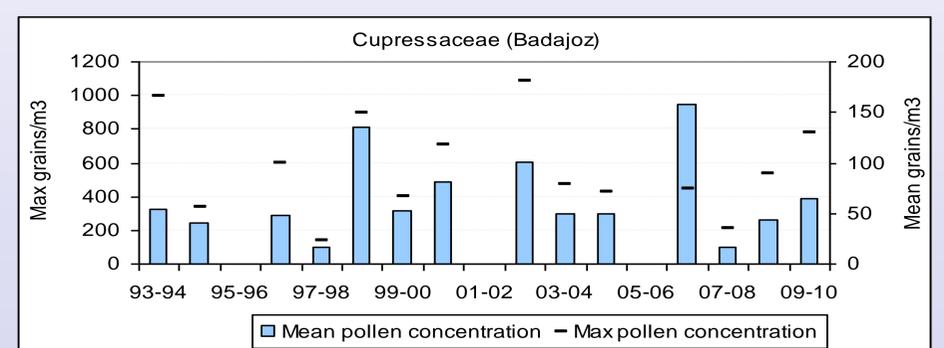


Fig. 3. Annual maximum and mean pollen concentration of Cupressaceae pollen in Badajoz.

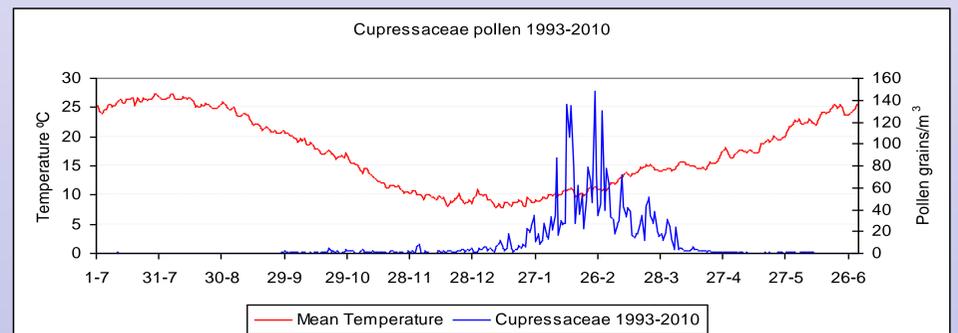


Fig 4. Mean pollen concentration Cupressaceae pollen in Badajoz and temperature.

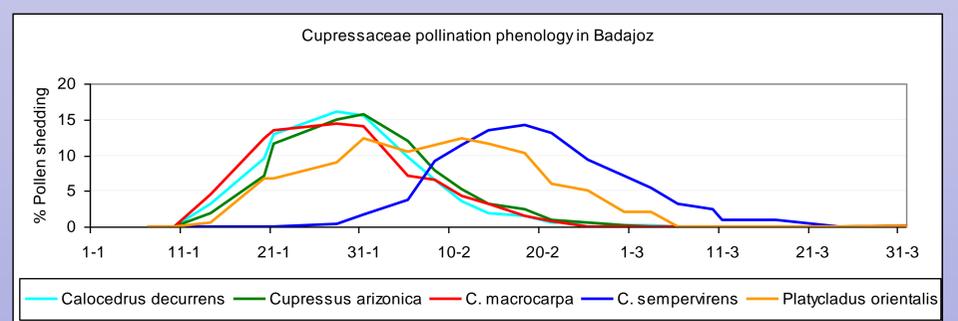


Fig 5. Average phenology of the five species of Cupressaceae in Badajoz.

## Conclusions

It seems that Cupressaceae pollination showed a delayed trend in Badajoz, by one day and a half per year. There is no trend in total pollen recorded or maximum peak reached. As airborne Cupressaceae pollen sources are from cultivated species, their concentration are not directly dependent on rainfall. Nevertheless, our results could be explained as a consequence of the different phenological pollination pattern of Cupressaceae cultivated in the area studied. Furthermore, garden practices as growing more frequently *C. sempervirens* could explain the trend found.