

CUPRESSACEAE POLLEN COUNTS IN A CHANGING CLIMATE: 38 YEARS OF OBSERVATION

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INTRODUCTION

Our objective was to verify whether or not the climatic change that we are suffering progressively each year, is affecting the aerobiological and clinical behavior of cupressaceae pollen in Madrid.

MATERIAL AND METHODS

Cupressaceae pollen counts were carried out between 1979 and 2016, using Hirst volumetric collectors located at our clinic.

The start of the season was considered to be the first of three consecutive days with > 10 grains/ m^3 of air, not followed by more than 7 empty days. The end of the season was considered to be the last of three consecutive days with < 10 grains/ m^3 of air.

Data from the Barajas Meteorological Station were utilized.

Prick tests using *Cupressus arizonica* pollen: 1979 (n=100), 1994 (n=316) and yearly from 1999-2016 (n = 40.998). Yearly average of patients with pollinosis: 2.411.

RESULTS

The five-year average concentrations from 1979 were: 1963, 4813, 5455, 6948, 6985, 5976, 6727 and 9298 grains/ m^3 . (Fig.1).

The average five-year temperatures were 14.2; 13.8; 14.3; 14.9; 14.2; 14.7; 14.9 and 15.9 degrees Celsius. ($r_s = 0.7$ $p < 0.05$) (Fig.2).

The annual prevalence of positive skin tests to cupressaceae in 1979 was 0% and in 1994 20%. The five-year averages from 1999-2016 were 44, 45, 49 and 47% (Fig.3).

The start of the season was ahead by 51 days, and the end of the season was 25 days ahead with respect to the period 1979 – 1983. The duration increased by 26 days (Fig.4).

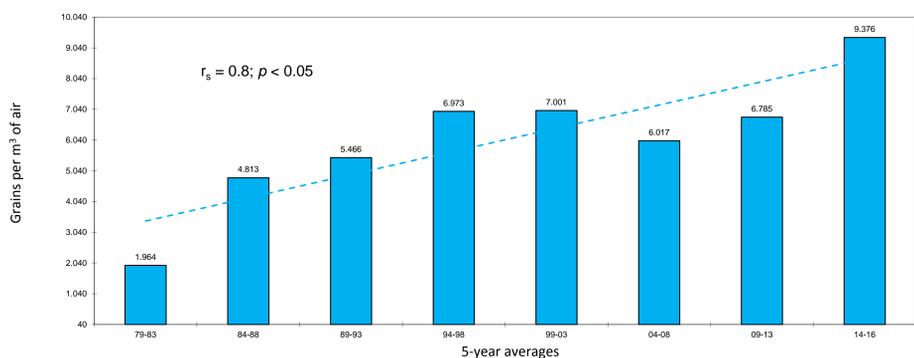


Fig.1.- Cupressaceae in Madrid (38 years)

We calculated the average of cupressaceae pollen counts in 5-year blocks, observing an average of 1964 grains/ m^3 in the period 1979-1983, compared to 9376 grains/ m^3 in the period 2014-2016 (multiplied by 4), thus objectifying a clear, positive linear tendency of an increase in the concentration of these pollens.

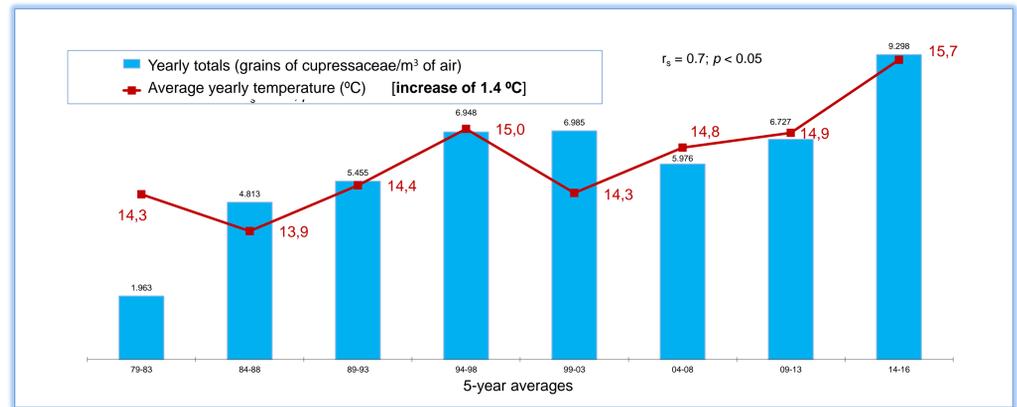


Fig.2.- Cupressaceae and temperatures in Madrid

This graph indicates the five-year average temperature compared to the average number of Cupressaceae pollen grains corresponding to each five-year period, showing a clear relationship and the upward trend of both.

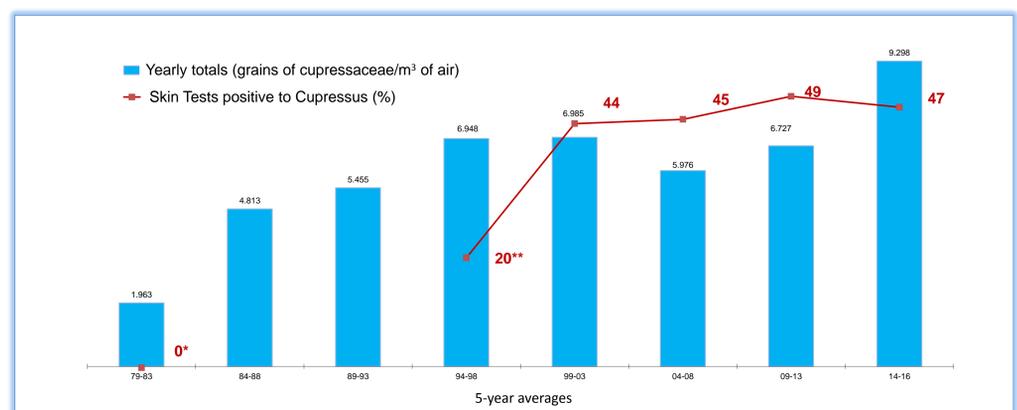


Fig.3.- Pollen counts and the prevalence of positive skin tests in Madrid.

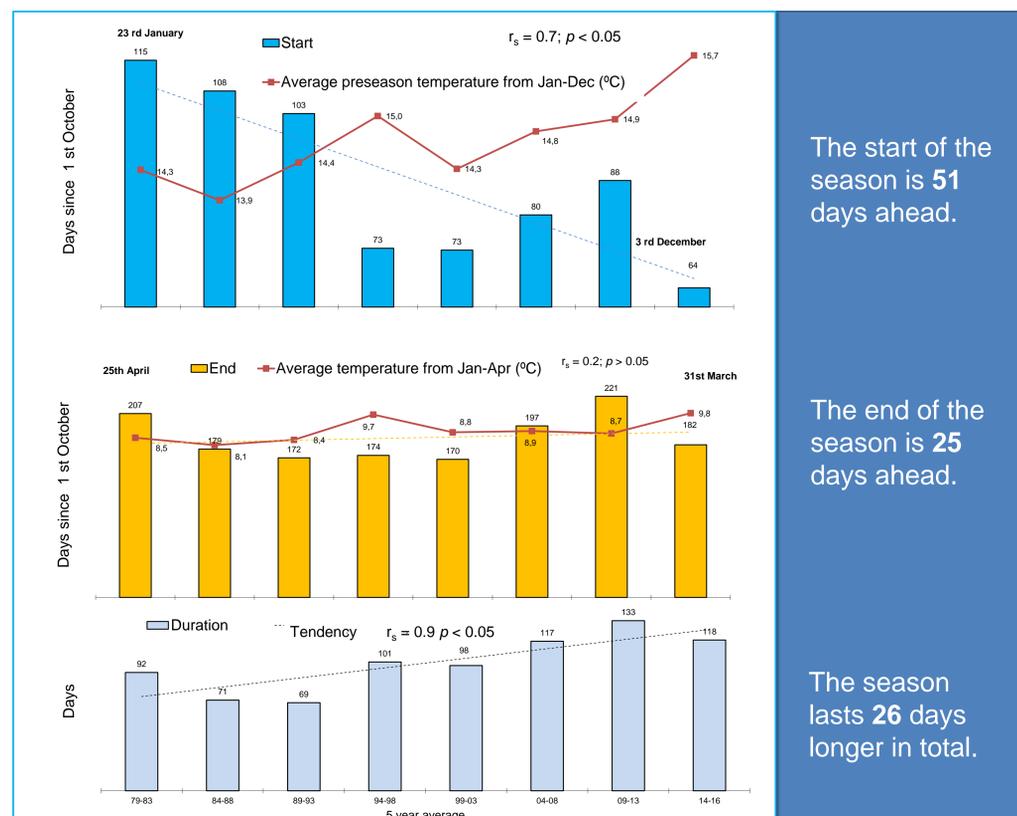


Fig.4.-

The start of the season is 51 days ahead.

The end of the season is 25 days ahead.

The season lasts 26 days longer in total.

CONCLUSION

1. A substantial increase in cupressaceae pollen counts correlates significantly with the substantial increase in temperature.
2. The significant early start to the season causes a longer duration.
3. A dramatic increase in the prevalence of sensitization is observed.