CONCENTRATION OF AIRBORNE POLLEN FROM CUPRESSACEAE IN LISBON

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Summary: The concentration of airborne pollen from Cupressaceae was regularly monitored in Lisbon during 1997 and 1999, and the phenology of flowering cypress was studied in several species of the genus from 1992 to February 2000. Both methods showed a peak of pollen abundance during the month of February, with the airborne pollen concentration decreasing strongly from March to April. The results obtained are in accordance with the literature for the Mediterranean area, but in Lisbon the peak started and finished earlier than in other Mediterranean towns already studied.

Key-words: Airborne pollen • Cupressaceae • Cupressus • Cypress, Lisbon • Pollen • Pollinosis, Portugal.

INTRODUCTION

Cypresses are among the most used ornamental trees in Portugal and in Lisbon particularly in the town of Lisbon. All the species common in Portugal were introduced from abroad, being especially frequent and widely adapted Cupressus sempervirens, with a Mediterranean origin, and Cupressus lusitanica introd. from Mexico during the 16th century.

A team of allergologists from the Portuguese medical community started in 1997 to feel the need to improve knowledge about the abundance of pollen from Cupressaceae, as well as about the incidence of this pollinosis within the Lisbon population.

Airborne pollen counts started in the same year, allowing the comparison between peaks of pollen abundance and pollinosis responses from patients. Through 1998 and 1999 the data obtained in Lisbon were compiled and their significance was tested. The study proceeded in Lisbon during 1999 and extended to the town of Partimao (Southern Portugal) and Coimbra (Central Portugal).

The aim of the current study is to report and discuss the seasonal peaks of airborne pollen from Cupressaceae collected in Lisbon during 1997 and 1999. To improve the knowledge on the pollination period of the several Cupressus species, data collected in a clonal field trial in the Lisbon area are also presented, trying to establish a relationship between the peaks revealed by the pollen counts and the pollinosis phenology of six cypress species.

MATERIALS AND METHODS

The pollen was collected with an airborne pollen collector of the type Cour (Cour, 1974) placed within the Botanical Garden of the University of Lisbon. The sampling took place every morning at 9 am. After centrifugation and microscope identification and counting, the number of pollen grains belonging to Cupressaceae was related to the volume of air (obtained from meteorological observation in the same place) crossing the sampling panel during the former 24 hours and expressed in number per cubic meter of air. The microscope observation took place with an immersion objective with magnification of 60-100x. The identification of species was based on several monographs of pollen morphology and in a reference collection belonging to the Laboratory of Palaeoecology of the University of Lisbon.

Field studies have been carried out in a clonal field trial established in Lisbon in 1988 by the Laboratorio de Patologas Vegetal 'Verissimo de Almeida', under the scope of two European projects (projects CAMAR 801/CT90-0003 and AIRS2-CT93-1679), with improved clonal material resistant to the cypress conker.
DISCUSSION

The data obtained in Lisbon indicated the most severe risk of pollinosis due to Cupressaceae still during the end of the winter period. Cupressaceae are the most common Cupressaceae within the Lisbon area. A detailed survey of the relative abundance in the area of genus and species belonging to this family is not available, but the current experience allows the conclusion that the presence of taxa other than Cupressus is of very low significance in this geographical region. This reinforces the idea that pollen allergies related to Cupressaceae may be strongly connected with the local expansion of cypresses.

The peak found in February agrees well with data from Panzoni et al. (1991) for C. sempervirens in other Mediterranean areas, but apparently the Lisbon peak starts and finishes earlier than the maximum referred by those authors.

References

The field trial undertaken in Lisbon indicated that there is a major pollination period from January to middle spring (April-beginning of May), with a peak in February corresponding mainly to the pollination of C. sempervirens and C. genovarica (table 2). These data confirm February as the most important pollination month. A secondary peak observed during the autumn months may be related to the pollination of C. lusitana.

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<table>
<thead>
<tr>
<th>Species period</th>
<th>Pollination period</th>
<th>Max. of Pollen</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. sempervirens</td>
<td>Dec.-April/May</td>
<td>1/2 Feb.-1/2 March</td>
<td>+++</td>
</tr>
<tr>
<td>C. lusitana</td>
<td>Jan.-March</td>
<td>Dec.-Jan</td>
<td>++++</td>
</tr>
<tr>
<td>C. pinus</td>
<td>Nov.-March</td>
<td>Jan.</td>
<td>+++</td>
</tr>
<tr>
<td>C. genovarica</td>
<td>Nov.-March</td>
<td>Jan.-Feb.</td>
<td>+++</td>
</tr>
<tr>
<td>C. brolesi</td>
<td>Jan.-April</td>
<td>March</td>
<td>++</td>
</tr>
<tr>
<td>C. globina</td>
<td>Jan.-April</td>
<td>Jan.</td>
<td>+++</td>
</tr>
</tbody>
</table>

Table 2: Variability of the pollination period for 6 Species of Cupressus (Lisbon, mean values for the period of October 1990-February 2000).