

Short Communication

Betulaceae, Corylaceae, Cupressaceae, Fagaceae and Salicaceae around Parma (Northern Italy): Pollen calendars from 1995 to 1997

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Abstract

Many seasonal respiratory allergies are caused by airborne pollens. There is an evident correlation between allergic attacks and the amount of pollens in the atmosphere at any time. The airborne tree pollen concentration and the relevant repercussions on pollinotics has not yet been extensively reported for all Italian regions. We present the results of a 3-year, weekly, tree pollen count by Burkard spore trap from the atmosphere of Parma, Italy. Annual pollen calendars were made from the results. The study has been conducted because, in Europe, an increasing frequency of allergic sensitisation to these pollens has been observed.

Introduction

Evidence is accumulated that the frequency of allergic rhinitis and asthma has increased world-wide over the last few decades. Airborne pollens cause many seasonal respiratory allergies (pollinosis) as evidenced by clear relations between the allergic symptoms and their atmospheric pollen concentrations (Sibbad and Strachan, 1994). The prevalence of hay fever is relatively low in children under 5 years of age, but rises rapidly to reach a peak in early adulthood and thereafter declines with advancing age. There are local or regional differences in the prevalence of hay fever as well as in the possible causal allergens. Aerobiological monitoring stations provide weekly information for the local newspapers, television and radio stations. The purpose of this information is to alert allergic patients enabling the use of preventive medication and avoidance measures as far as is possible (Subiza et al., 1995). The data collected by aeroallergen survey stations indicate the start of the season, peak periods and duration of the season (Spieksma, 1991).

Pollinosis derived from Betulaceae, Corylaceae, Cupressaceae, Fagaceae and Salicaceae has not yet been studied extensively in all the countries and particularly in some Italian regions (Spieksma, 1990; A.A.V.V., 1991). We have observed that the number of patients allergic to trees has been increasing around Parma in recent years (Dall'Aglia et al., unpublished). For this reason we evaluated the daily concentration of Betulaceae, Corylaceae, Cupressaceae, Fagaceae and Salicaceae from 1995 to 1997 in the outdoor environment around Parma, Northern Italy.

Materials and methods

Airborne pollen studies were made from January to June every year by means of Burkard volumetric spore trap which was placed on the top terrace (meteorological tower) of the Parma's Mathematics University Department about 20 m above street level. The daily amount of pollen from the tree families (Betulaceae, Corylaceae, Cupressaceae, Fagaceae, Salicaceae) was

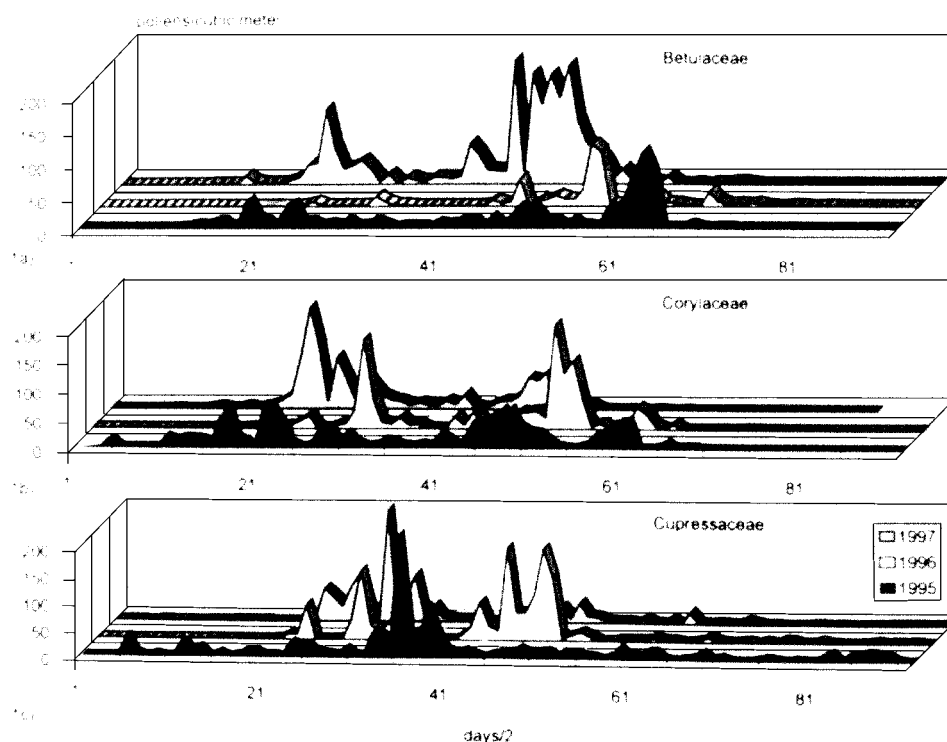


Figure 1. Sections a, b, c, presence of tree pollen January to June in every year of observation. The days/2 indicate the two-day mean.

obtained by weekly sampling. Annual pollen calendars were made with the results. Every week, on Monday at 9 a.m. the plastic strip was moved, replaced and cut into daily sections. Every section was fixed on slide then coloured by fuchsin fenicate and observed by optical microscope. The pollen grains, in accordance with their morphological characteristics, were counted on 4 longitudinal section (48 mm) parallel to the movement direction of the Burkard trap's strip. Thus we obtained the daily concentration/ m^3 of air in accordance with methods proposed by the Italian Association of Aerobiology (A.I.A.). We also recorded meteorological data, namely rainfall and temperature.

Results

Around Parma, Betulaceae pollen was present in 1995 from January to April without elevated peaks; in 1996 the data showed higher concentration beginning March and April and in 1997 the data showed higher concentration in February and April (Figure 1a). The Corylaceae were present in 1995 from January to May without elevated peaks; showed higher concentration

in April 1996 and in February, March and April 1997 (Figure 1b). In 1995 Cupressaceae showed the higher concentrations in February–March; in 1996 showed higher concentration beginning March and April; in 1997 Cupressaceae showed higher concentration in February and March (Figure 1c). In 1995 Fagaceae were elevated during March and April, with one late peak in June; in 1996 the Fagaceae showed two peaks in April and May, with one late peak in June; in 1997 were high in March and April, with one late peak in June (Figure 2a). In 1995 Salicaceae were high also in March; in 1996 showed two peaks at the end of March and April; in 1997 the Salicaceae showed the peaks at the end of February beginning March (Figure 2b). Figure 3a and 3b represent temperature and rainfall during the observation periods.

Conclusions

The area of Parma is exposed to high concentration of tree pollens grains from February (Betulaceae) to June (Fagaceae). The tree pollens type quantitatively more important and present are Fagaceae and Cupressaceae with about 300 pollen grains/cubic meter. In

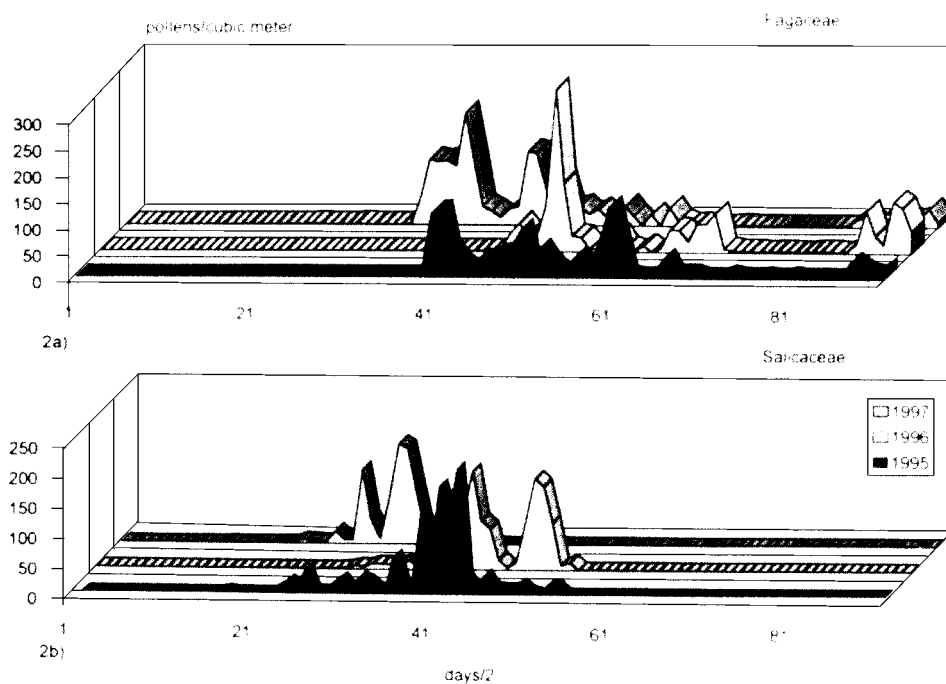


Figure 2. Section a, b, presence of tree pollens indicated in the photography title from January to June in the every year of observation. Days/2 stands for two-day mean.

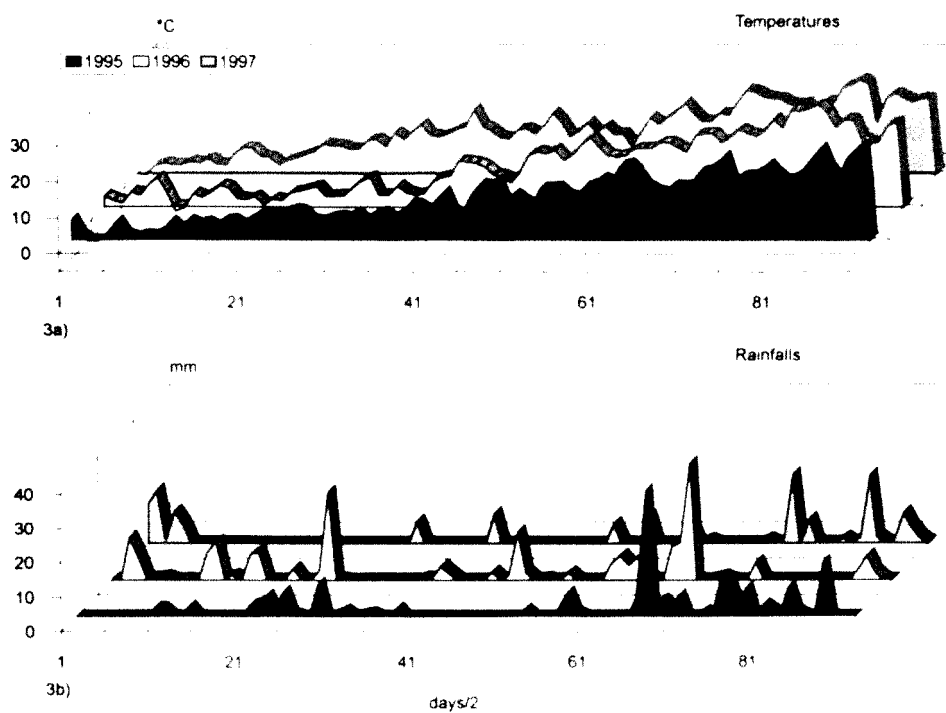


Figure 3. Section a, b, temperatures and rainfalls during the observation periods. Days/2 stands for two-day mean.

the years 1996 and 1997 all the trees examined had no long flowering periods but in some trees we noticed repeated flowering periods. On the contrary in 1995 the peaks were lower but lasted longer (Figure 3) despite temperature and rainfall being similar during these years. The knowledge of pollination peak and period for each pollen enables a better correlation between skin responses and symptomatology and a more accurate management of pharmacological or hyposensibilisation treatment. The main goal of this research work is to provide an information regarding the frequency of tree pollen in atmosphere to the medical practitioners and patients (D'Amato and Spieksma, 1993; D'Amato and Spieksma, 1998). Studies on relevance in sensitisation to Betulaceae, Corylaceae, Cupressaceae, Fagaceae and Salicaceae in Parma's area are in progress (Dall'Aglio et al., unpublished).

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