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Aeropollen research in the air of Budapest in 1992

By

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A b s t r a c t : Authors report the aeropollen content of Budapest in the whole pollen season. With the help of a Seven-day Recording Volumetric Spore and Pollen Trap they analysed the daily data from the beginning of February till the end of October.

Since 1989 we have been doing quantitative and qualitative analysis of the aeropollen content in Hungary. Our aim was to identify the main pollen seasons and the significant allergenic taxa in our country. We already reported our results obtained in the last three years in several publications (JÁRAI-KOMLÓDI 1991a, 1991b, JÁRAI-KOMLÓDI *et al.* 1991, MEZEI *et al.* 1992a, MEZEI *et al.* 1992b). The present paper introduces our conclusions for the year of 1992 in Budapest.

METHOD

Daily aeropollen concentrations were analysed by using a Burkard Seven-day Recording Volumetric Spore and Pollen Trap. Our trap is accommodated and operated in compliance with the current standards of the European Allergenic Network. The daily data and their seven-day averages are shown in the diagrams. The seven-day averages give information about the trends of appearance of the taxa, while the daily data provide the extreme values of pollen spreading. Their common introduction, their comparison with the main meteorological data (temperature, precipitation, air-pressure, etc.) give more exact information regarding the atmospheric pollen content, the time and the degree of the prospective allergenity.

RESULTS

In 1992 we observed 21 taxa in the atmosphere of Budapest, the quantity of which occasionally or permanently exceeded 30 pollen per m^3 of the air.

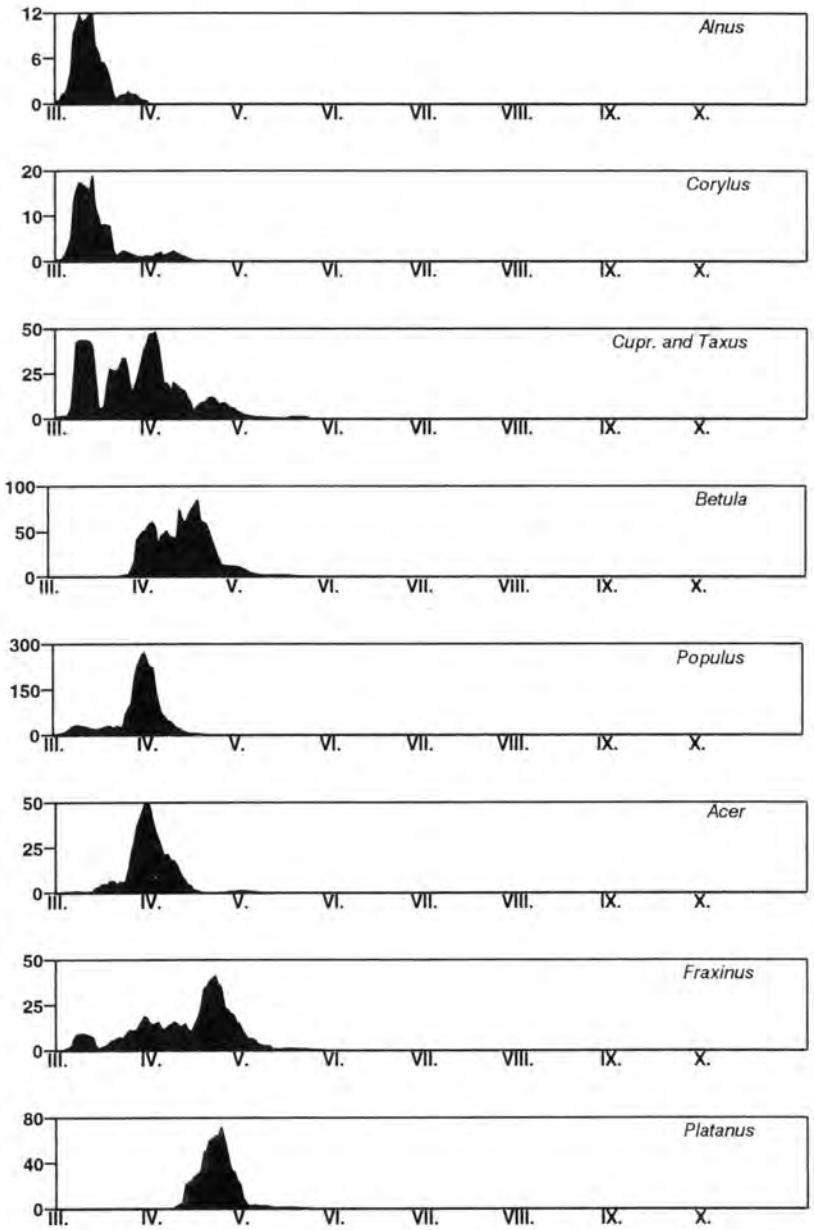
From among the trees and shrubs the *Acer*, *Aesculus*, *Alnus*, *Betula*, *Celtis*, *Corylus*, Cupressaceae, *Fraxinus*, *Morus*, *Pinus*, *Platanus*, *Populus*, *Quercus* and *Taxus* reached this level. Among them the *Alnus*, *Betula*, *Corylus*, *Fraxinus*, *Platanus* and the *Quercus* are known to cause considerable allergy (Fig. 1).

In 1992 the amount of the tree pollen exceeded that of the same measured in 1991. The total calculated tree pollen was 15,132 as opposed to 9789 in the last year. Except for a few, like *Acer*, *Alnus*, *Pinus*, *Platanus*, the pollen production of each tree was higher. The flowering time began later in 1992 than in 1991; only 8 pollen fell into the trap before March.

In spite of the extremely high pollen content, the spring pollen season causes the smallest problems for allergenic people in our country. Trees with prominent pollen production, like *Pinus* and *Populus* are not allergenic. *Alnus*, *Betula* and *Corylus* are not widely distributed trees

in Hungary, and their pollen production is moderate, consequently, their role in causing allergy has only occasional and local significance.

The flowering of grasses started here at the end of April to early May, this year. Usually the quantity of grass pollen in the air is not high but its allergenity is considerable, and its pollen emission is long lasting, because the flowering of several grass species is prolonged. Even at the beginning of October there were some grass pollen in our samples. We could determine two



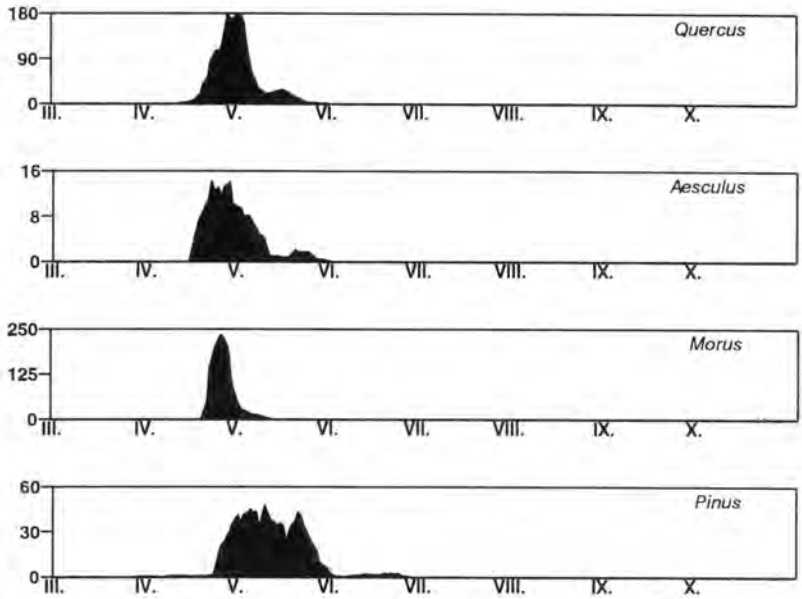


Fig. 1. Pollen calendar of the trees (pollen per m^3 air - seven-day averages)

pollen peaks, one in May, and one at the end of June—beginning of July (Fig. 2). In 1992 we registered a total number of 1924 grass pollen, compared to 896 measured in 1991.

In July, when the weeds start flowering, there is a higher quantity of pollen in the air. Though the threshold value, $30/m^3$, was not reached, the pollen of *Rumex* and *Plantago* was continuously present in the air. In 1992 an allergenic quantity of *Urtica* and *Cannabis* was observed, and there was a great amount from members of the Chenopodiaceae and Amaranthaceae.

The main flowering, and thus the pollen peaks of the two most dangerous weeds, namely *Artemisia* and *Ambrosia* follow each other with a shift of a few days. Considering the data of 1991, both of them appeared earlier and in a higher amount this year. The pollen number of *Artemisia* was nearly threefold, that of *Ambrosia* fivefold.

Both of them are very allergenic, air pollinated, their pollen production is high. (Out of the 11,229 weed pollen 7424 were of *Ambrosia* and *Artemisia*). They reinforce each other's allergenic effect. Both are present in the air for a number of months, up to the first frosts (Fig. 3).



Fig. 2. Pollen calendar of the grasses (pollen per m^3 air - seven-day averages)

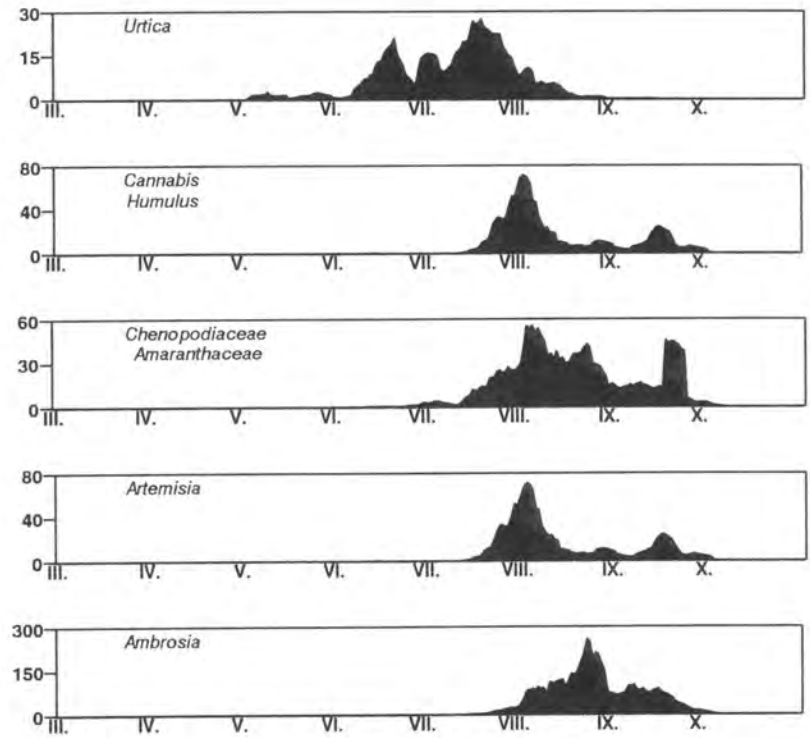


Fig. 3. Pollen calendar of the weeds (pollen per m^3 air — seven-day averages)

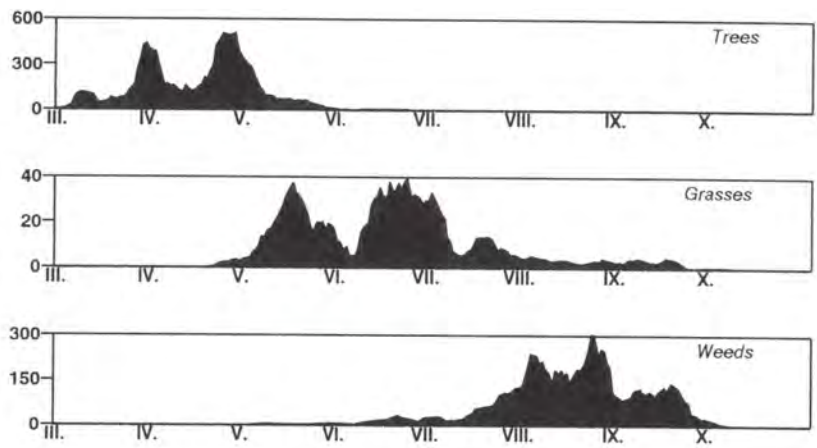


Fig. 4. Pollen calendar of the main pollen groups (pollen per m^3 air — seven-day averages)

CONCLUSIONS

The variation outlined above shows the difference in the pollen production and the phenology which is caused by the weather. These can more or less modify the data from year to year in the same town, thus, of course, the time and degree of the appearance of the allergenic symptoms. However, the trend of the presence and dominance of the allergens can be determined only by using the results of several years of investigations. In the international practice some 5 to 10 years are needed for prediction, depending on the geography and climate of the locality.

Our four years of recording allow us to draw the following conclusions:

I. There are three pollen seasons in Hungary:

1. the spring season caused by trees,
2. the summer season caused by grasses,
3. the late summer-autumn season caused by weeds (Fig. 4).

II. From the point of view of pollen allergy, on the basis of the observed allergenic diseases (JÁRAI-KOMLÓDI *et al.* 1991; MEZEI *et al.* 1992a, MEZEI *et al.* 1992b) we can state that in the whole territory of our country there are two main pollen seasons:

1. the summer season caused by the grasses,
2. the late summer-autumn season caused first of all by *Ambrosia* and *Artemisia*, and members of the Chenopodiaceae and Amaranthaceae families.

Most allergenic symptoms are caused by those listed under 2, and these weeds are very noxious not only to the health but to agriculture and to the environment as well. So the nation-wide use of herbicides, as one of the means of prevention is necessary.

The regular aeropollen monitoring system can be used well by the medical practice for prevention.

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