



Short Communication

Some details about ragweed airborne pollen in Hungary

Magda Járαι-Komlódi

Botanical Department, Hungarian Natural History Museum, Budapest, P.O.B. 222, H-1476 Hungary

Received 22 January 1999; accepted in final form 2 March 2000

Key words: *Ambrosia*, pollen monitoring, weedpollen

Abstract

Ambrosia elatior – the only species living in Hungary – appeared at the beginning of this century on the southern border of the country, along the Danube. Since then, unfortunately, it has become the most common weed in Hungary, and the quantity of its pollen is many times higher than the European average (Jäger, 1998; Juhász, 1998). Based on the results of our ten-year (1989–1998) monitoring in Hungary, there is no doubt than more than 60% of late summer-early autumn pollen originates from ragweed, causing the most serious pollinosis in Hungary. The quantity and ratio of ragweed pollen is much higher and the length of *Ambrosia* pollen season is longer in the southern than in the northern part of Hungary.

Introduction

The most important pollen allergens in Hungary are the weeds, first of all the ragweed. The first two pollen traps were established ten years ago in Budapest (northern Hungary) and Szeged (southern Hungary), and both belong to the universities. They have been working continuously since 1989.

Since 1992 twelve further pollen monitoring stations have been set up and operated partly by the National Institute of Public Health and the József Attila University in Szeged (Figure 1).

Materials and methods

We have been using a Burkard Seven-day Recording Volumetric Pollen and Spora Trap for sampling. The samples were divided up into daily sections, each corresponding to 24 hours and were analyzed by the usual international methods. The pollen counts given in the text and in the graphics are calculated values expressed as numbers of pollen grains per cubic meter of air.

Results

Comparing the monitoring results of several years from the different sites in Hungary it is obvious that the trend of the pollen season is the same everywhere in the country.

It is clear that the Hungarian pollen seasons show 3 main parts: tree season (February–April), grass season (May–July), weed season (July–October) (Figure 2). From the figure it is also clear that in September–October 90% of the total pollen concentration is due to *Ambrosia*. It is also shown that the longest and most serious allergy period when the symptom score reaches the highest value in Hungary is the weed season. There is *Ambrosia* pollen at least for two and frequently for three months every year in the air and is usually found over much longer periods in the southern than in the northern region.

During the weed season, from July to October, the percentage of *Ambrosia* pollen as compared to the global airborne pollen content is as high as 74% in the southern part of the country (Szeged 74%, Pécs 70%) and nearly 50% in the northern region (Budapest 49%,



Figure 1. Aerobiological monitoring in Hungary.

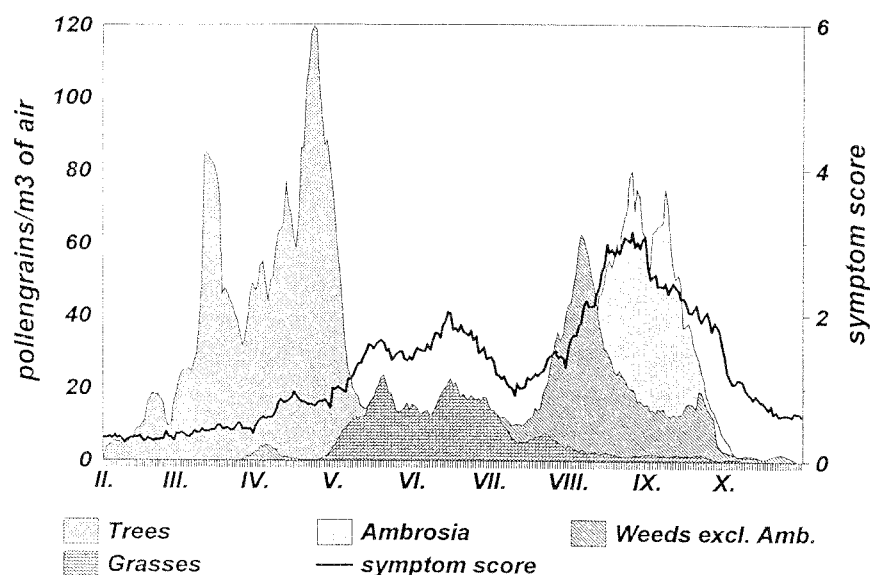


Figure 2. Pollen seasons and symptom score. 5 years average.

Győr 45%) (Figure 3). So, *Ambrosia* pollen concentration is extremely high among the weeds but *Artemisia*, *Chenopodiaceae-Amaranthaceae* pollen concentration also reach remarkable levels (Szeged 18%, Budapest 24%). Others – except *Poa* in certain years – do not show significant values such as *Cannabis*, *Humulus*,

Urtica, *Rumex*, *Plantago* during the weed season. Taking into account the quantity of ragweed pollen as compared to the annual pollen count, the *Ambrosia* pollen content in the air seems to be much higher in southern Hungary than in the other parts of the country (Figure 4). It is the highest in Szeged, Pécs, Kec-

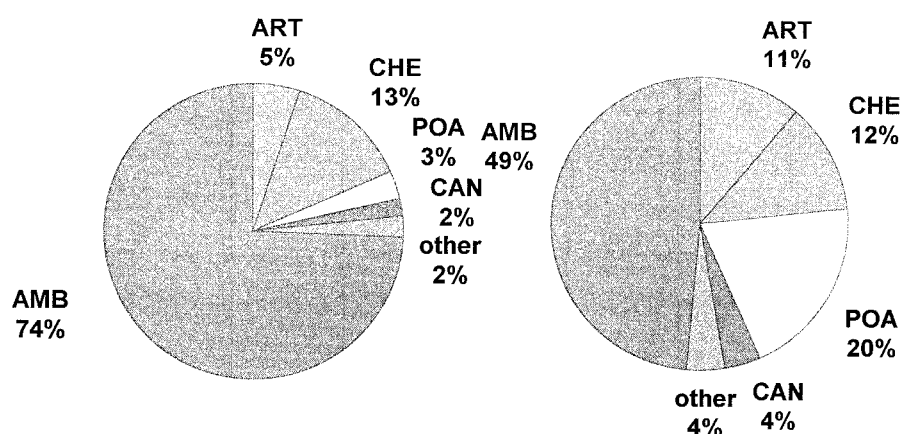


Figure 3. Incidence of weed taxa in the late summer–autumn pollen production in Szeged and in Budapest (1992–1997). AMB = *Ambrosia elatior*, ART = *Artemisia*, CHE = *Chenopodiaceae-Amaranthaceae*, POA = *Poaceae*, CAN = *Cannabis-Humulus*.

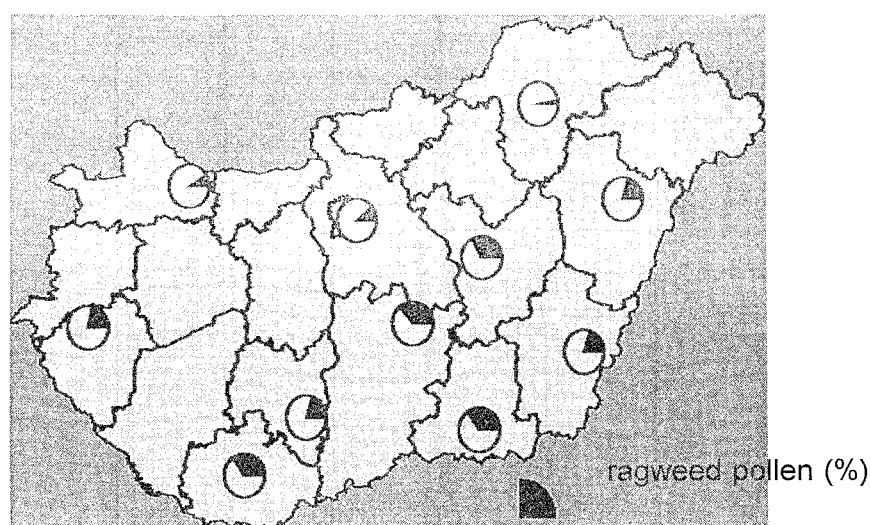


Figure 4. Annual ragweed pollen count comparing to the annual total pollen count.

skemét, Szolnok, and the lowest in Miskolc. The lower level of ragweed pollen counts can be explained with the unfavourably cooler climate in the mountainous northern part of Hungary and with the less extensive ploughlands (Fehér and Járai-Komlódi, 1996).

The ragweed pollen count exceeds 30 pollen grains/m³ for more than 20 days per year in Budapest and – with the exception of 1 or 2 years – is twice as much for about 40 days in the southern part of Hungary, e.g. in Szeged, Pécs (Figure 5). This is another distinct difference between the northern and southern parts of the country.

On the peak days the *Ambrosia* pollen counts reach 2000 pollen grains/m³ in the southern region and 500 pollen grains/m³ in Budapest. In certain years the

annual sums of ragweed pollen grains are as much as nearly 20 thousand in southern Hungary (Szeged, 1991, 1992, 1994) and 3–5 thousand in Budapest (1992, 1993, 1996). These data show some quantitative differences between the southern and northern parts of the country, as well (Járai-Komlódi and Juhász, 1998).

Conclusions

The nearly ten-year monitoring and the increasing amount of data collected by more and more traps every year suggest that there is a difference between the southern and the smaller northern part of Hungary:

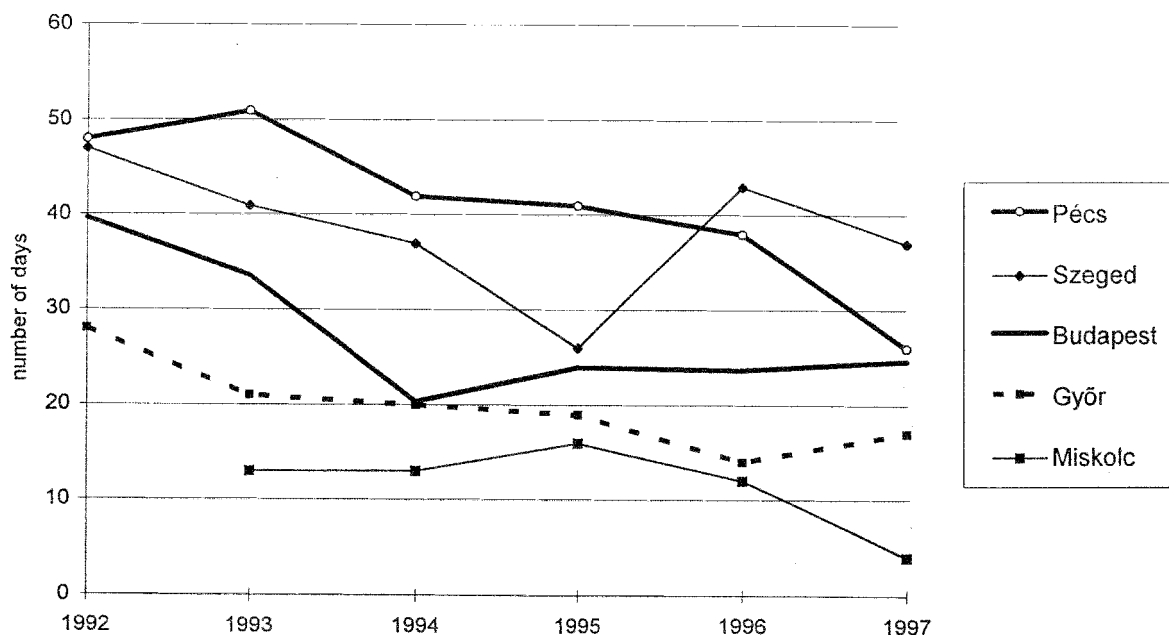


Figure 5. Number of days when the ragweed pollen count exceeds 30 pollen grains/m³.

both the total pollen concentration and the annual ragweed pollen concentration are higher in the South than in the North.

In addition, considering some further, mainly locally important differences we can conclude that in the larger southern part of Hungary we have more serious allergy problems, especially in the weed season. But clinically, Hungary as whole shows a rather uniform picture in which the most important allergens are the weeds, first of all ragweed, and the most important pollen seasons are the grass and the weed season throughout the country.

Acknowledgements

I would like to thank M. Juhász (József Attila University, Szeged), Z. Fehér (National Institute of Public

Health, Budapest) and Gy. Mezei (Department of Pediatrics, Semmelweis Medical University, Budapest who contributed some of data and figures.

References

- Fehér Z. and Járai-Komlódi M.: 1996, Relationship between airborne ragweed pollen concentration and the macrosynoptic weather types in Budapest, Hungary. *Annals of Agricultural and Environmental Medicine* 3, 1–6.
- Jäger S.: 1998, Global aspects of ragweed in Europe. *Proc. Sat. Symp., 6th Intern. Congress on Aerobiology*, Perugia, pp. 6–10.
- Járai-Komlódi M. and Juhász I.: 1998, A levegő biológiai szennyezettsége parlagfű pollennel (Biological airpollution by ragweed pollen in Hungary). In: T. Szabó and E. Miriszlai (eds), *Environmental Damages and the Respiratory System*. Hévíz, pp. 71–76. In Hungarian.
- Juhász M.: 1998, History of ragweed in Europe. *Proc. Sat. Symp., 6th Intern. Congress on Aerobiology*, Perugia, pp. 11–14.