BETULA POLLEN SEASON IN THE DANUBE-KRIS-MURES-TISA EUROREGION (2000-2002)

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Abstract:

Betula is considered the most important aeroallergen among tree species.

The aim of this study was to compare Betula pollen season in three cities situated in the Danube-Kris-Mures-Tisa euro region. Novi Sad (Serbia and Montenegro), Szeged (Hungary) and Timisoara (Romania) routinely monitor aeropollen concentrations using Hirst type pollen and spore trap. Duration of the Betula pollen season, seasonal peak concentrations and season start dates were compared for the period 2000-2002.

Three year average pollen season duration were 71 days in Novi Sad and 46 and 47 days in Szeged and Timisoara, respectively. Szeged measured the highest peak concentrations, except in 2002, when peak concentration in Novi Sad reached extremely high level (1034 PG/m^3). For Szeged was characteristic high number of days with pollen concentrations higher than 30 PG/m^3 (39% of pollen season), while this number was lower for Novi Sad and Timisoara (18% and 13% of pollen season, respectively).

Keywords:

Aeropollen, Betula, pollen concentration, allergy

1. INTRODUCTION

The onset of pollen allergy symptoms has been correlated to atmospheric concentrations of allergenic pollen. Knowledge of yearly-

fluctuations in pollen count is useful in clinical correlations and development of effective patient treatment regimes [5]

Betula pollen is one of the main European aeroallergens triggering symptoms of asthma and seasonal rhinitis [6]. It was shown that major *Betula* pollen allergen (antigen Bet v 1) makes cross reactivity with major apple allergen (antigen Mal d 1), which could cause anaphylactic shock [7]. Further knowledge of *Betula* pollen season in Europe is therefore very important to clinicians and patients.

The aim of this study was to present and compare *Betula* pollen season in three cities situated in the Danube-Kris-Mures-Tisa Euroregion.

2. MATERIAL AND METHODS

Pollen samples were collected in 2000, 2001 and 2002 by Hirst volumetric method with a Burkard or Lanzony pollen and spore trap. [The collector pump was aspirating a volume of 10 l/min of air through a 14 x 2 mm slit, which was permanently oriented to windward.

The resulting air stream hits onto a tape covered with a thin layer of petroleum jelly [3]. The tape was fixed around the drum, which was rotated by a seven-day clockwork at a speed of two mm/h [4]. At the end of the collecting period, this tape was cut into 48 mm segments, each corresponding to 24 hours. The tape segments were stained with phenylated glycerol-gelatin and fuchsine, and the pollen grains were identified and counted in an optic microscope [3]. Five scans were performed over each segment with the magnification of 400x (in accordance with the recommendations of the International Aerobiology Association)].

The daily pollen grain count per cubic meter of air (pg/m^3) could be calculated by multiplying the cumulative observed count of the five scans by a correction factor, resulting from the proportion between the scanning area of the optical field of the microscope to the collecting tape area (14mm x 48mm). Pollen identification was based on the comparison with the reference slides and photographs. Start of pollen season was calculated as first day when $1pg/m^3$ occurs in atmosphere. 30 pg/m^3 was chosen as critical concentration of *Corylus* pollen because this concentration is considered as a threshold for the start of allergic symptoms by patients sensitive to *Betula* pollen, which have similar antigens [1])

3.RESULTS AND DISSCUSION

Betula pollen season in Danube–Kris-Mures-Tisa starts at the end of February and during March. Three year average pollen season duration were 71 days in Novi Sad and 46 and 47 days in Szeged and Timisoara, respectively (Table 1).

Betula pollen could be considered as important allergy inducer in observed region, because of high number of days when its pollen occurs in atmosphere. Such long pollen season duration enlarges risk of occurrence of cross-reactions between *Betula* pollen and fruit allergens.

Table 1. Betula pollen season duration and start date (in parenthesis)

	Novi Sad	Szeged	Timisoara
2000	64 (1. March)	37 (23. March)	20 (27. February)
2001	67 (13. March)	62 (13. March)	55 (13. March)
2002	82 (27. February)	38 (8. March)	66 (5. March)
Average season duration	71 days	46 days	47 days

Szeged measured the highest peak concentrations, except in 2002, when peak concentration in Novi Sad reached extremely high level (Table 2.).

Table 2. Peak concentrations (in pg/m^3)

	Novi Sad	Szeged	Timisoara
2000	97	148	9
2001	95	219	46
2002	1034	185	106

For Szeged was characteristic high average number of days with pollen concentrations higher than 30 pg/m^3 (39% of pollen season), while this number was lower for Novi Sad and Timisoara (18% and 13% of pollen season, respectively) (Table 3).

Table 3. Number of days when Betula pollen concentration reached critical values

	Novi Sad	Szeged	Timisoara
2000	10	20	0
2001	8	22	8
2002	22	13	10
Average	13 days	18 days	6 days
Part of season when *Betula* pollen reached critical concentrations	18%	39%	13%

It should have been considered that priming effect of *Corylus* and *Alnus* pollen and increasing air pollution could decrease the reactivation threshold in patients with *Betula* allergy [8].

Further studies should provide knowledge about meteorological factors that cause start and duration of *Betula* pollen season, in order to make accurate forecasts for occurrence of *Betula* pollen in atmosphere. These forecasts could help pollen sensitive patients to organize their life stile, in order to diminish problems caused by pollen allergy.

5. REFERENCES

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