Mugwort pollen season in southern Poland and Lviv (Ukraine) in 2015

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Abstract: The aim of the study was to compare the pollen season of the mugwort in Zielona Gora, Opole, Wroclaw, Sosnowiec, Cracow, Lublin, Guciow (Roztocze National Park) and Lviv. Measurements of pollen concentrations were performed with the volumetric method (Burkard or Lanzoni pollen sampler) in Poland and using the Durham trap in Lviv. Maximum pollen concentrations were observed in all measurement sites in the period between 2nd and 15th August. The highest concentration, the highest annual sum of pollen grains, and the highest risk of pollen allergy due of the presence of high concentrations of mugwort pollen grains in the air were recorded in Zielona Gora, Lublin, and Opole.

Key words: aeroallergens, pollen concentration, mugwort (*Artemisia*), 2015

Mugwort pollen grains contain allergens, which are one of the three (together with grass and birch) most common causes of pollen allergy in Poland. Symptoms of the disease caused by allergens of this plant are observed in late summer [1]. Patients who are allergic to mugwort pollen most frequently exhibit intolerance to celery, carrots, apples, and herbs (mainly chamomile) [2]. The threshold concentration evoking first allergy symptoms is 30 grains/m^3 in oversensitive individuals and 55 grains/m^3 in all allergic patients [3].

Aim

The aim of the study was to compare the mugwort pollen concentration in the air of selected cities of southern Poland and Lviv in 2015.

Material and method

Measurements of airborne mugwort pollen were carried out in Zielona Gora, Opole, Wroclaw, Sosnowiec, Cracow, Lublin, Guciow (Roztocze National Park), and in Lviv. Aeroplankton samples were

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Table 1. *Characteristics of mugwort pollen season in 2015.*

Site	Pollen season period by the 98% method	Maximum pollen count (P/m³) date	Annual pollen sum	Number of days with concentrations above threshold		
				30 P/m³	55 P/m³	70 P/m³
Zielona Gora	12.07–7.09	113 6.08	1642	20	11	8
Opole	20.07–18.09	68 12.08	995	16	3	0
Wroclaw	26.07–31.08	55 15.08	732	9	1	0
Sosnowiec	20.07–16.09	56 5.08	524	2	1	0
Cracow	21.07–17.09	28 6.08	359	0	0	0
Lublin	19.07–14.09	74 2.08	1101	16	2	1
Guciow (Roztocze)	25.07–12.09	34 3.08	308	1	0	0
Lviv	23.07–27.08	29 8.08	237	0	0	0

Figure 1. *Mugwort pollen count in Zielona Gora in 2015.*

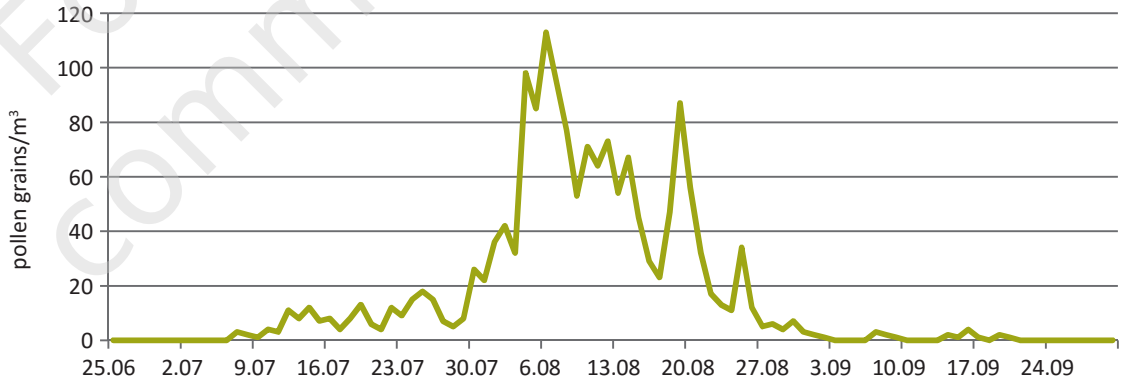


Figure 2. *Mugwort pollen count in Opole in 2015.*

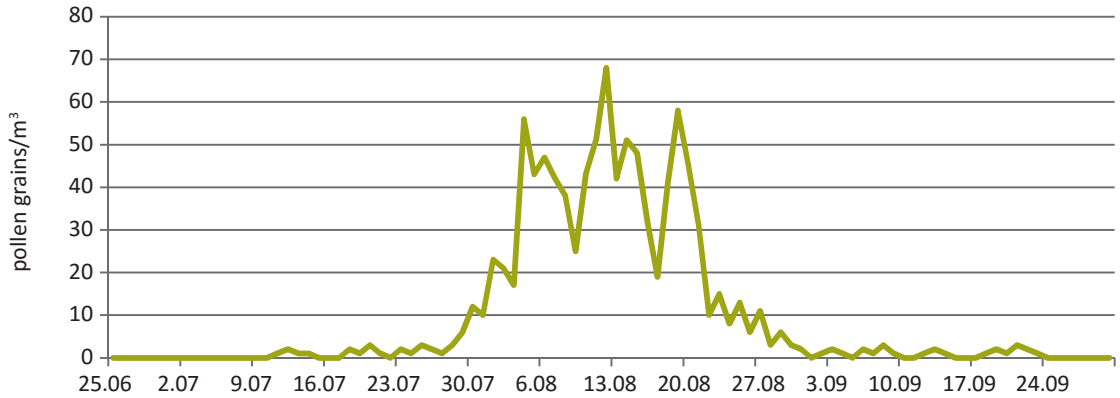


Figure 3. *Mugwort pollen count in Wroclaw in 2015.*

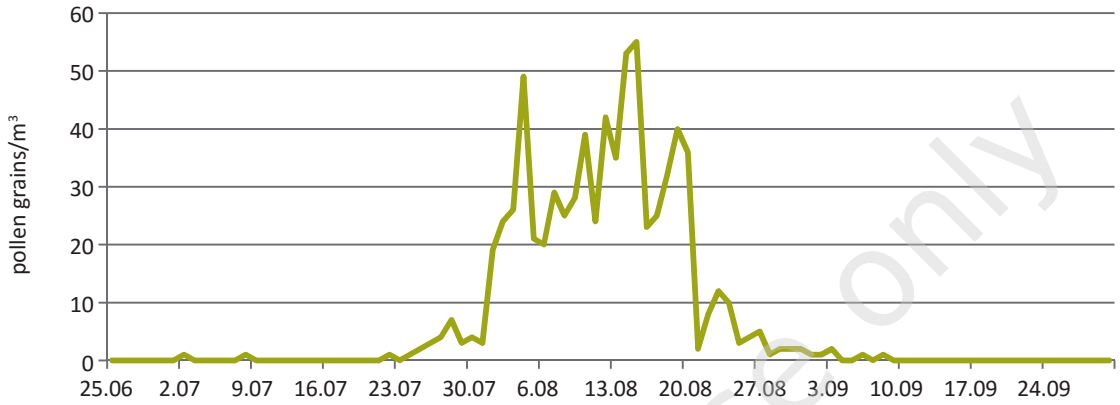


Figure 4. *Mugwort pollen count in Sosnowiec in 2015.*

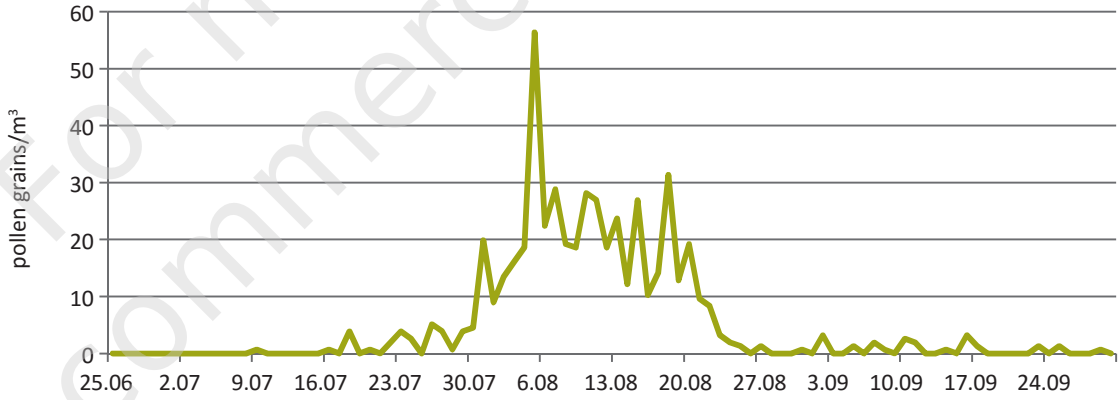


Figure 5. *Mugwort pollen count in Cracow in 2015.*

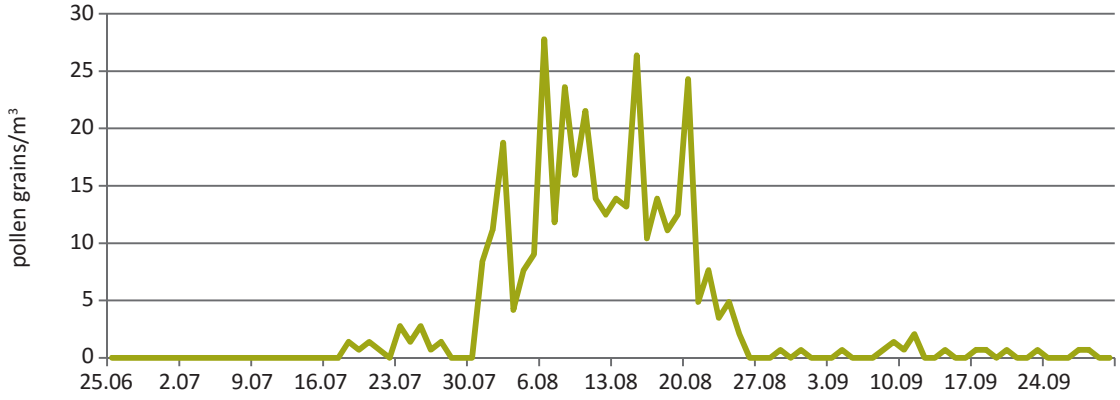


Figure 6. *Mugwort pollen count in Lublin in 2015.*

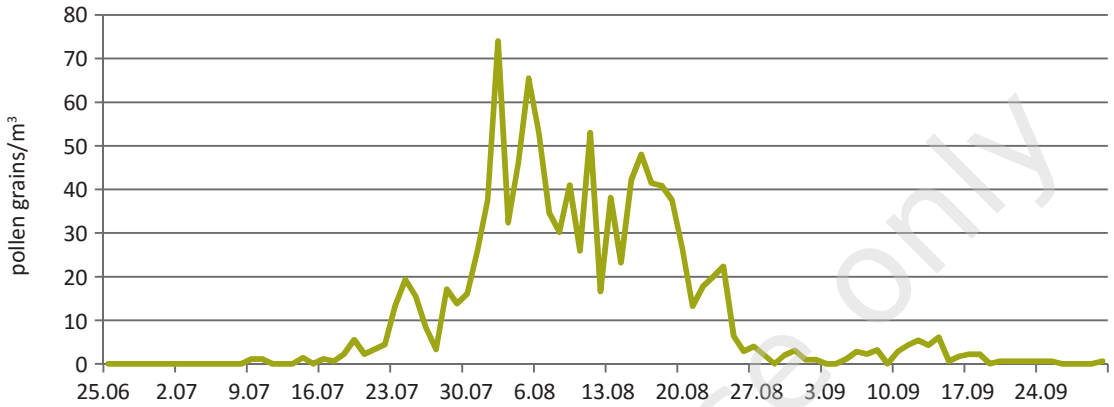


Figure 7. *Mugwort pollen count in Guciow (Roztocze) in 2015.*

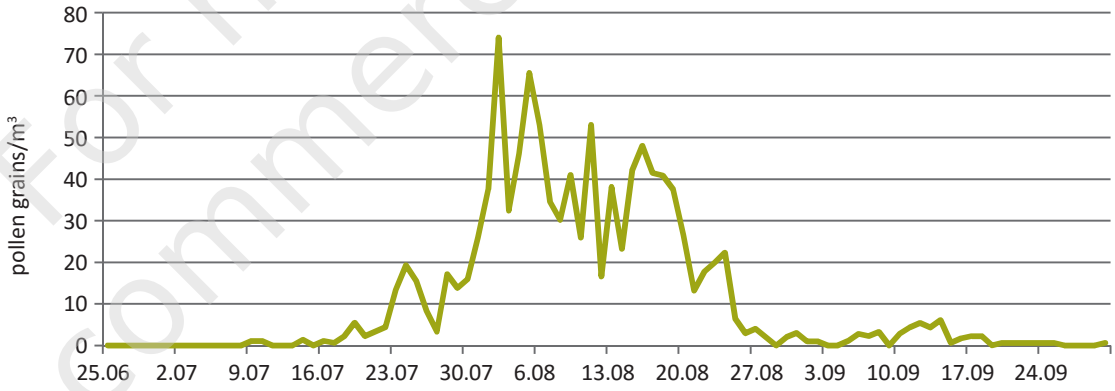
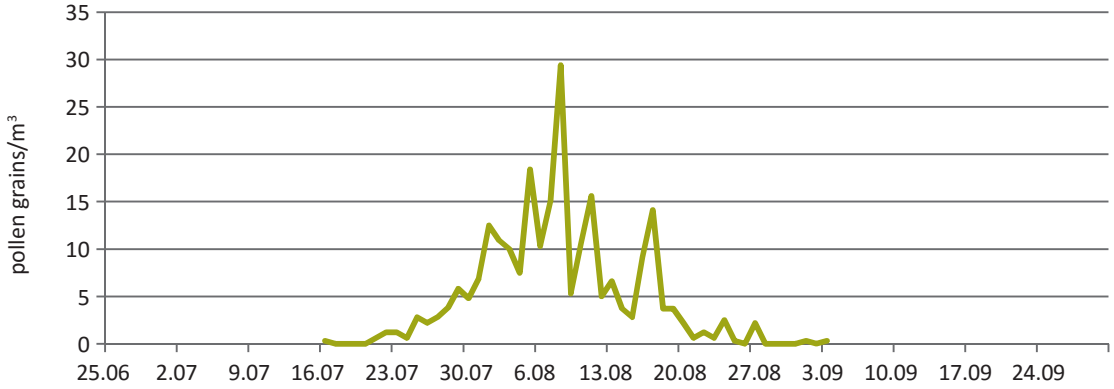


Figure 8. *Mugwort pollen count in Lviv in 2015.*



collected with the volumetric method using Burkard or Lanzoni pollen samplers at a continuous operation mode. Microscopic slides were made in a 7-day cycle with assessment of 24-hour periods. In Lviv, the investigations were conducted with the gravimetric method using a Durham sampler. For comparison of the data obtained with this method with the volumetric data, a conversion rate of 3,2 was employed in accordance with the recommendations proposed by Basset et al. [4]. The results were expressed as the number of pollen grains in 1 m^3 of air per day (P/m^3). The length of the mugwort pollen seasons was determined with the 98% method.

Results and discussion

In 2015, the mugwort pollen season commenced between 12nd and 26th July and persisted until late August or mid-September (tab. 1). The highest daily pollen count was noted in Zielona Gora (113 P/m^3) and the lowest concentration was reported from Cracow (28 P/m^3) and Lviv (29 P/m^3) (tab. 1). In a majority of the cities, periods of maximum concentrations were noted in the first week of August, the earliest in Lublin (2nd August) and in the second week of August in Lviv, Wroclaw, and Opole (tab. 1, fig. 1–8). The risk of allergy associated with the persistence of high levels of mugwort pollen (above 30 P/m^3) was the greatest in Zielona Gora (20 days), Opole, and Lublin (16 days in each city). This concentration was never exceeded in Cracow and Lviv. A pollen concentration causing acute clinical symptoms (above 70 P/m^3) was noted in Zielona Gora (8 days) and Lublin (1 day).

The comparison of mugwort pollen seasons in previous years revealed lower pollen concentrations in Lublin and Cracow in 2015 than in 2011–2014 [5–8]. In contrast, the mugwort pollen season in Zielona Gora in 2015 was characterised by substantially higher pollen concentrations than in 2013 [7].

Conclusions

In 2015, the first two decades of August were characterised by high pollen concentrations in all measurement sites.

The highest daily pollen concentration and the highest annual sum of mugwort pollen grains were recorded in Zielona Gora, Lublin, and Opole.

The highest risk of allergy associated with pollen counts exceeding the threshold value was noted in Zielona Gora, Lublin, and Opole.

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