Ash pollen count in the air of selected Polish cities in 2017

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Abstract: The aim of the study was to compare the pollen season of ash in Bialystok, Bydgoszcz, Cracow, Drawsko Pomorskie, Lublin, Olsztyn, Sosnowiec, Szczecin, Warsaw, Wroclaw and Zielona Gora in 2017 year. Measurements of pollen concentration were performed by the use of volumetric method (Burkard or Lanzoni pollen sampler). The pollen season of ash started in all measurement sites in the last week of March and first week of April. The peak values of seasonal pollen count occurred between 31st March and 10th April in all cities. The highest concentration of 772 pollen grains × m^{-3} was noted in Cracow, and the lowest of 45 pollen grains × m^{-3} in Bialystok. The risk of pollen allergy because of the presence in the air the high concentrations of ash pollen grains was the biggest in Cracow (10 days) and in Zielona Gora (9 days). The highest annual sum (SPI, Seasonal Pollen Index) of ash pollen grains was recorded in Cracow (1928), and it was over 9 times higher than in Bialystok (218).

Key words: allergens, pollen count, Ash (*Fraxinus*), 2017

Ash tree (*Fraxinus excelsior*) is the main representative of the *Oleaceae* family in temperate zones [1–3]. Diagnosis of ash pollen allergy is made difficult due to an overlapping pollination period with *Betulaceae* and some cross-reactivity with minor allergens from *Betulaceae* [1]. It is not clear whether ash pollen is a primary cause of sensitization or whether it is implicated through cross-sensitization to other pollens [4]. Fra e 1 is a major allergen for ash pollen-sensitized individuals in northern and central Europe [2, 3]. Ash pollen should be considered a relevant factor and distinct entity in spring pollinosis. In all, only 20% of positive skin tests to ash appear to result from cross-sensitization to pollen panallergens

[4]. Ash pollen allergy was not routinely investigated and its clinical relevance may well have been underestimated, particularly since ash and birch tree pollination times are largely the same [5].

Aim

The aim of the study was to compare the pollen season of ash in Bialystok, Bydgoszcz, Cracow, Drawsko Pomorskie, Lublin, Olsztyn, Sosnowiec, Szczecin, Warsaw, Wroclaw and Zielona Gora in 2017.

Material and method

Measurements of airborne alder pollen were carried out in Bialystok, Bydgoszcz, Cracow, Drawsko Pomorskie, Lublin, Olsztyn, Sosnowiec, Szczecin, Warsaw, Wroclaw and Zielona Gora in the year 2017. Measurements were performed by the volumetric method (Burkard and Lanzoni as the Hirst type pollen sampler).

The total pollen count over this period was expressed by the symbol SPI (Seasonal Pollen Index). On the basis of literature data, the number of days with concentrations of the pollen of the *Fraxinus* genus exceeding the threshold values at which the consecutive allergy symptoms develop were determined (tab. 1) [2].

Results

In 2017, the ash pollen season started between 29th March (Cracow and Zielona Gora) and 6th April (Bialystok) and lasted until the end of April. The peak values of seasonal pollen count occurred between 31st March and 10th April in all cities. The highest concentration of 772 pollen grains × m^{-3} was noted in Cracow, 263 pollen grains × m^{-3} was noted in Szczecin, 243 pollen grains × m^{-3} was noted in Zielona Gora, and the lowest of 45 pollen grains × m^{-3} in Bialystok and 56 pollen grains × m^{-3} in Olsztyn. The highest ash pollen allergen hazard occurred (above 45 g/m^3) in Cracow (10 days) and Zielona Gora (9 days). Pollen concentration causing severe clinical symptoms (above 85 g/m^3) was noted in Wroclaw (7 days) and in Cracow (5 days).

Table 1. *Characteristics of ash pollen season in 2017.*

Features of pollen season	Bialystok	Bydgoszcz	Cracow	Drawsko Pomorskie	Lublin	Olsztyn	Sosnowiec	Szczecin	Warsaw	Wroclaw	Zielona Gora
Seasonal Polen Index – SPI (total)	218	493	1928	605	1173	326	575	1067	853	862	1313
Peak value and peak date	45 (10 IV)	76 (7 IV)	772 (2 IV)	167 (3 IV)	208 (3 IV)	56 (10 IV)	73 (2 IV)	263 (1 IV)	157 (5 IV)	134 (31 III)	243 (2 IV)
Days ≥ 45 g/m^3	1	3	10	4	6	2	3	9	6	7	9
Days ≥ 85 g/m^3	0	0	5	1	4	0	0	5	1	7	4

Figure 1. *Ash pollen count in Bialystok in 2017.*

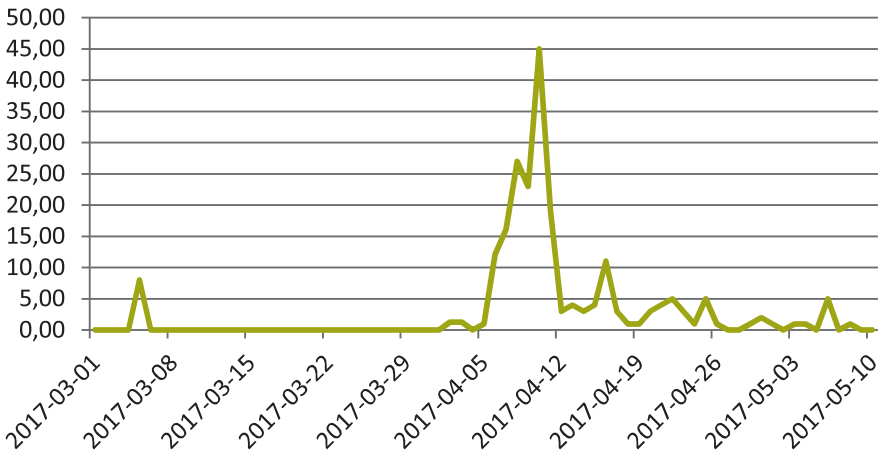


Figure 2. *Ash pollen count in Bydgoszcz in 2017.*

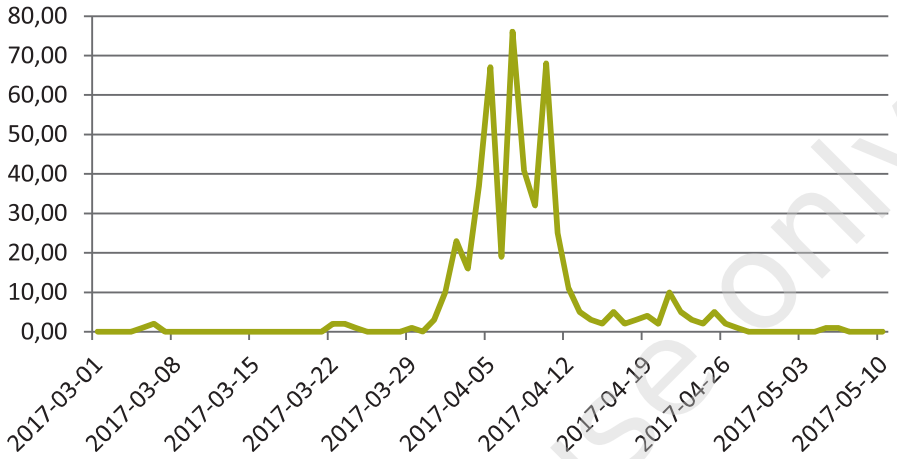


Figure 3. *Ash pollen count in Cracow in 2017.*

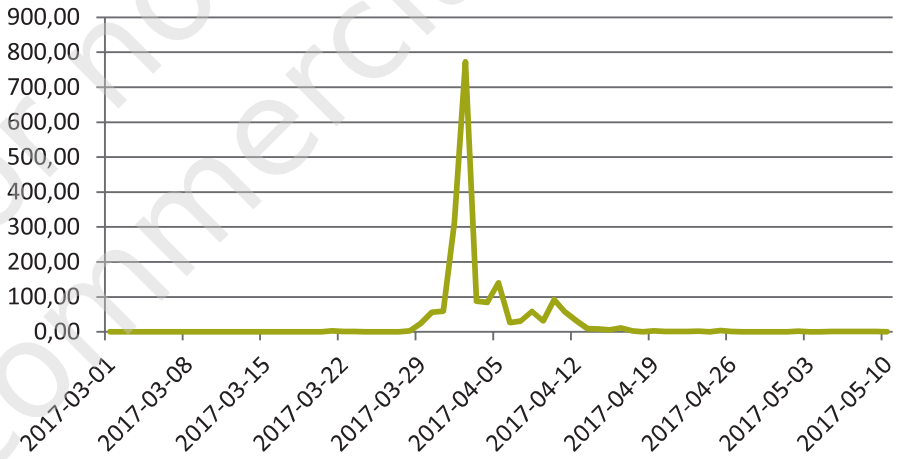


Figure 4. *Ash pollen count in Drawsko Pomorskie in 2017.*

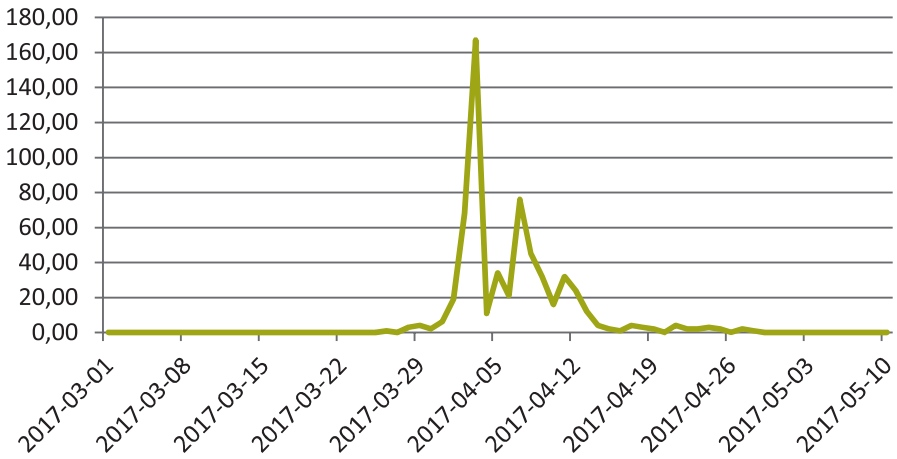


Figure 5. *Ash pollen count in Lublin in 2017.*

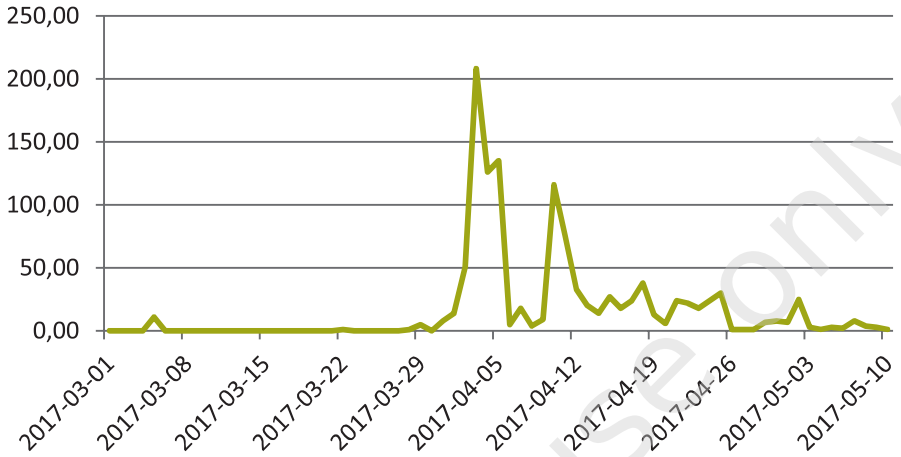


Figure 6. *Ash pollen count in Olsztyn in 2017.*

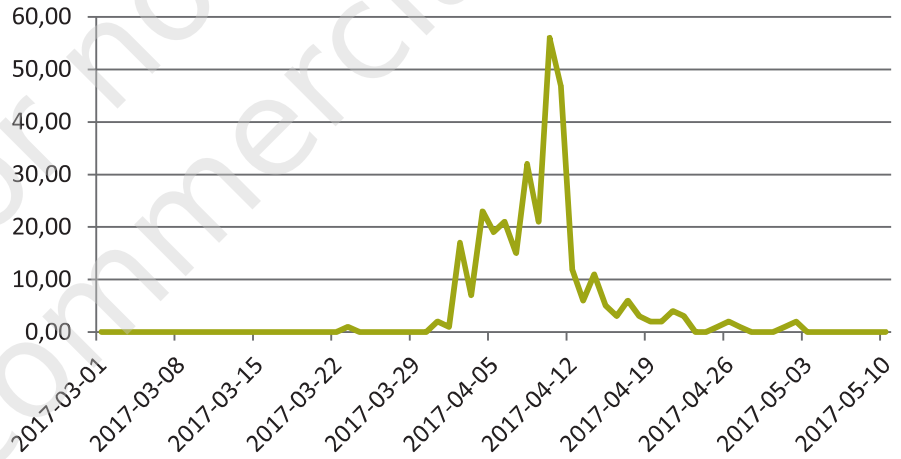


Figure 7. *Ash pollen count in Sosnowiec in 2017.*

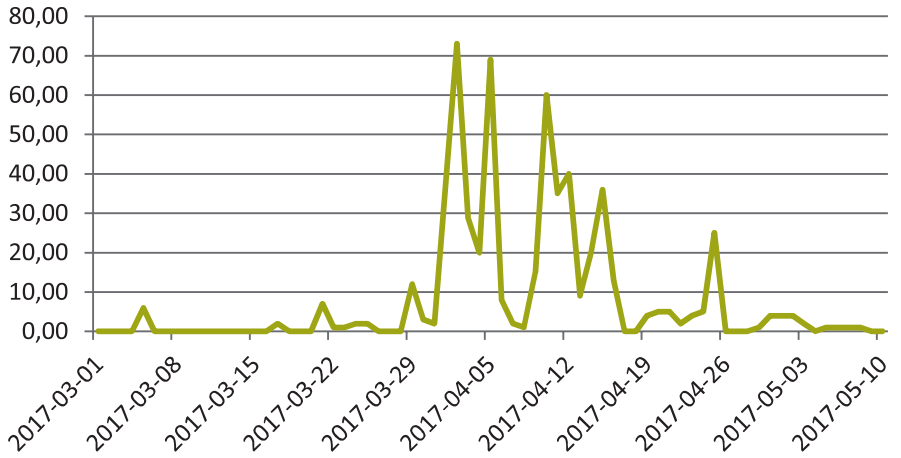


Figure 8. *Ash pollen count in Szczecin in 2017.*

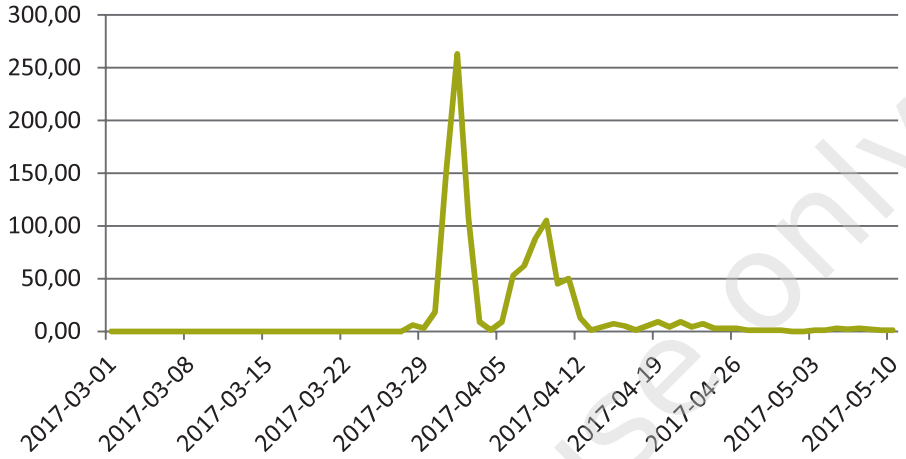


Figure 9. *Ash pollen count in Warsaw in 2017.*

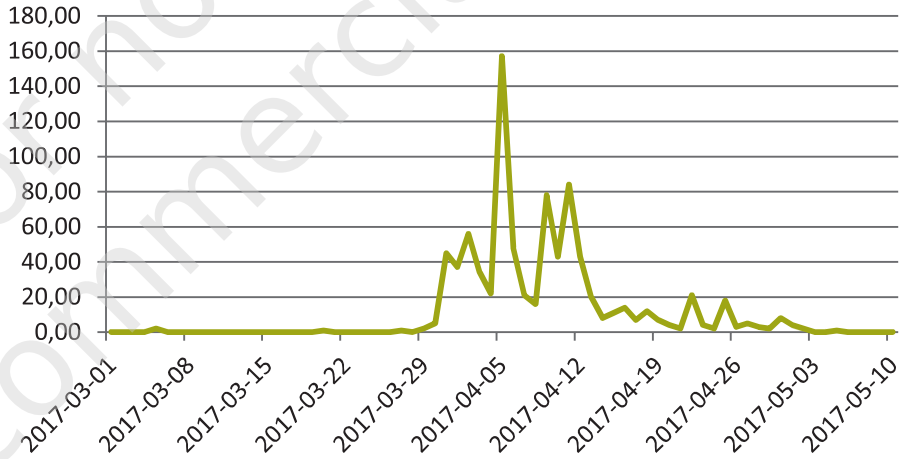


Figure 10. *Ash pollen count in Wroclaw in 2017.*

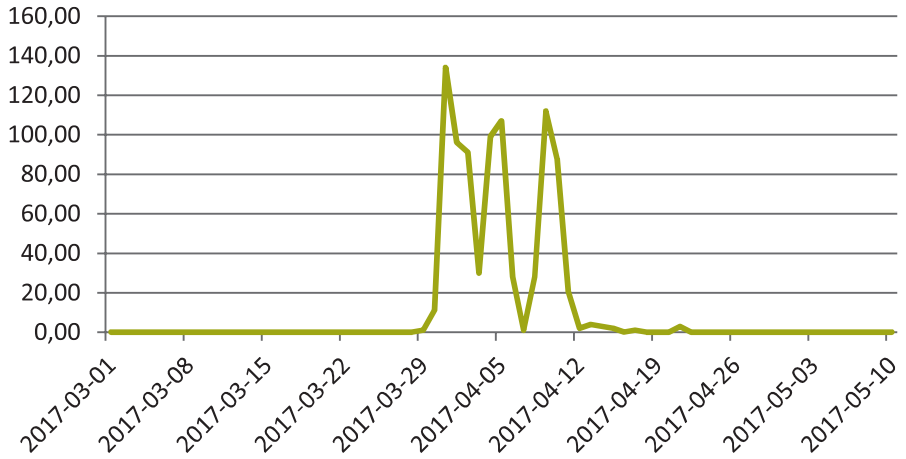
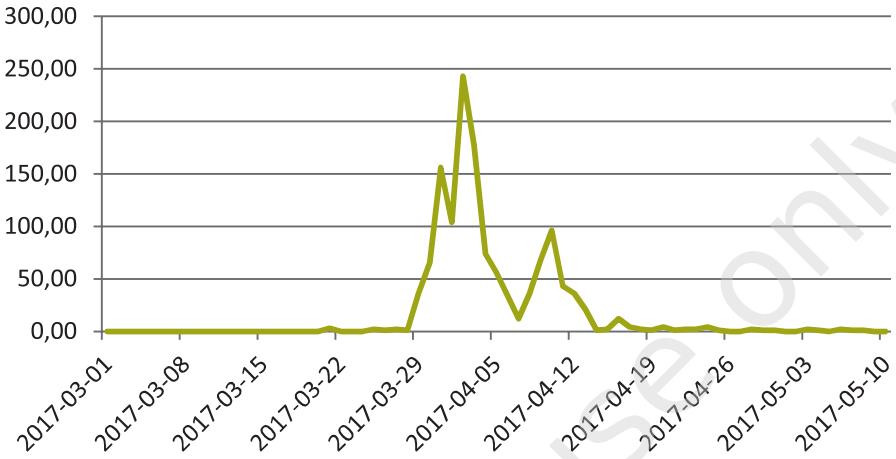


Figure 11. *Ash pollen count in Zielona Gora in 2017.*



Conclusions

The pollen season of ash started in all measurement sites in the last week of March and first week of April.

The peak values of seasonal pollen count occurred between 31st March and 10th April in all cities.

The highest concentration of 772 pollen grains × m^{-3} was noted in Cracow, and the lowest of 45 pollen grains × m^{-3} in Bialystok.

The updating of pollen calendars and accurate pollen announcements are important for efficient prophylaxis and immunotherapy of pollen allergies.

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Szczygielski K: 40%; Puc M: 10%; Lipiec A: 10%; and other Authors: 3% each.
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The authors declare that they have no competing interests.
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Ethics:
The contents presented in this paper are compatible with the rules the Declaration of Helsinki, EU directives and standardized requirements for medical journals.

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