

# Alder pollen season in selected cities of Poland in 2017

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**Abstract:** The study compares the alder pollen seasons in Zielona Gora, Poznan, Wrocław, Opole, Sosnowiec, Cracow, Piotrków Trybunalski, and Lublin in 2017. The investigations were conducted using the volumetric method. The alder pollen season began between 22<sup>nd</sup> and 27<sup>th</sup> February. Maximum daily pollen concentrations were noted on the same date (4–5<sup>th</sup> March) in all the cities. The greatest risk of allergies caused by the presence of airborne alder pollen was observed in Zielona Gora, Opole, and Piotrków Trybunalski.

**Key words:** aeroallergens, pollen concentration, alder (*Alnus*), 2017

In Poland, *Alnus* pollen has great clinical importance and, after birch, is the most common cause of airborne allergy in the early spring. Alder pollen seasons exhibit very high variability. Differences in the onset dates in individual years can be as large as up to 2 months [1, 2]. A comparison of regional-scale analyses indicates that the earliest beginning of the alder pollen season is noted in the west of the country, while the latest onset is recorded in the east [1]. The first symptoms of allergy develop at a threshold concentration of 45 pollen grains/m<sup>3</sup> in a majority of highly susceptible subjects and 85 grains/m<sup>3</sup> in all allergic individuals [3].

## Aim

The aim of the study was to compare the alder pollen season of 2017 in selected cities of Poland.

## Material and method

The investigations of the airborne alder pollen concentration were conducted in Zielona Gora, Poznan, Wrocław, Opole, Sosnowiec, Cracow, Piotrków Trybunalski, and Lublin. Volumetric Burkard or Lanzoni devices were continuously used in all measurement stations in 2017. The results were expressed as the number of pollen grains in 1 m<sup>3</sup> of air per day

(P/m<sup>3</sup>). The pollen season was determined with the 98% method. The start of the season was defined as the date when 1% of the seasonal cumulative pollen count was trapped and the end of the season when the cumulative pollen count reached 99% [4]. The number of days with a concentration equal to or greater than 45 P/m<sup>3</sup> and 85 P/m<sup>3</sup>, i.e. values that may trigger hypersensitivity symptoms, were determined [3].

### Results and discussion

In 2017, the alder pollen season began in the third decade of February, between 22<sup>nd</sup> and 27<sup>th</sup>, and lasted for approximately a month. The end of the season was recorded at nearly the same time in all cities, i.e. between 25<sup>th</sup> and 27<sup>th</sup> March (tab. 1; fig. 1–4). In previous years, the onset of the alder season was noted on different dates, e.g. in early February in 2016 [5] and in early March in 2015 [6].

In 2017, the maximum daily concentration of alder pollen in most cities was recorded on the same day, 5<sup>th</sup> March, with the exception of Wrocław, where the maximum was noted a day before and Cracow, where the same very high pollen concentrations were recorded on 4<sup>th</sup> and 5<sup>th</sup> March. The highest seasonal peak was recorded in Poznan, Lublin, and Wrocław. The lowest peak values were noted in Cracow and

Sosnowiec. The lowest peak values were recorded in Cracow and Sosnowiec in other study years as well [6, 7]. In 2017, the maximum pollen concentration was noted 5–6 days earlier than in 2015 [6].

In 2017, the sums of alder pollen grains were in the range of 1399–8557; the highest sum of grains was noted in Zielona Gora and the lowest totals were recorded in Sosnowiec and Cracow. The pollen sums were 2–3-fold higher than in 2015 and lower than in 2016 [5, 6].

The highest risk of pollen allergy expressed in days with pollen levels exceeding the threshold value at which first symptoms of allergy develop (45 P/m<sup>3</sup>) was shown for Zielona Gora (27 days). In the other cities, the risk of allergies related to the pollen levels exceeding the threshold value persisted from 9 to 23 days. The number of days with a concentration of 85 P/m<sup>3</sup> or higher, at which a majority of allergic subjects present with symptoms, greatly varied and ranged from 5 to 21 days. The greatest number of days with high pollen concentrations was recorded in Zielona Gora while Sosnowiec was characterised by the lowest number.

### Conclusions

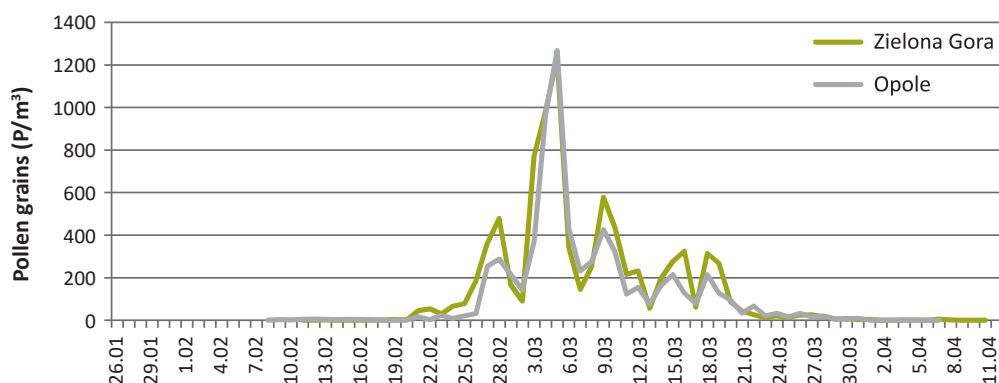
1. In 2017, the alder pollen season in all the analysed cities began in the third decade of February and lasted until late March.

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

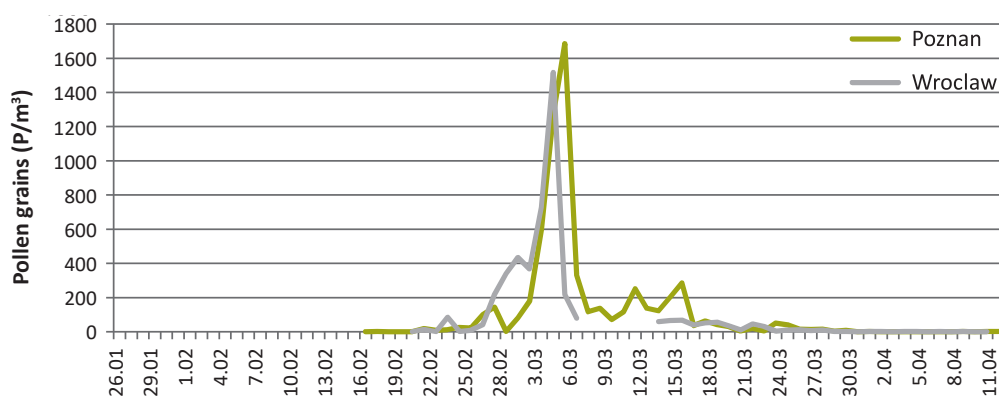
Site	Pollen season period (the 98% method)	Season duration (number of days)	Peak value (P/m <sup>3</sup> ) and peak date	Annual pollen sum	Number of days with concentration above threshold	
					45 P/m <sup>3</sup>	85 P/m <sup>3</sup>
Zielona Gora	22.02–26.03	33	1231 5.03	8557	27	21
Poznan	24.02–25.03	30	1685 5.03	6259	19	15
Wrocław	23.02–26.03	32	1517 4.03	4557	15*	7*
Opole	23.02–26.03	32	1267 5.03	6958	23	20
Sosnowiec	24.02–26.03	31	266 5.03	1399	9	5
Cracow	24.02–25.03	30	245 4.03, 5.03	1593	11	6
Piotrków Trybunalski	24.02–27.03	32	1219 5.03	4972	22	14
Lublin	27.02–27.03	29	1522 5.03	5119	19	13

\* from 7<sup>th</sup> to 12<sup>th</sup> March there are no pollen data.

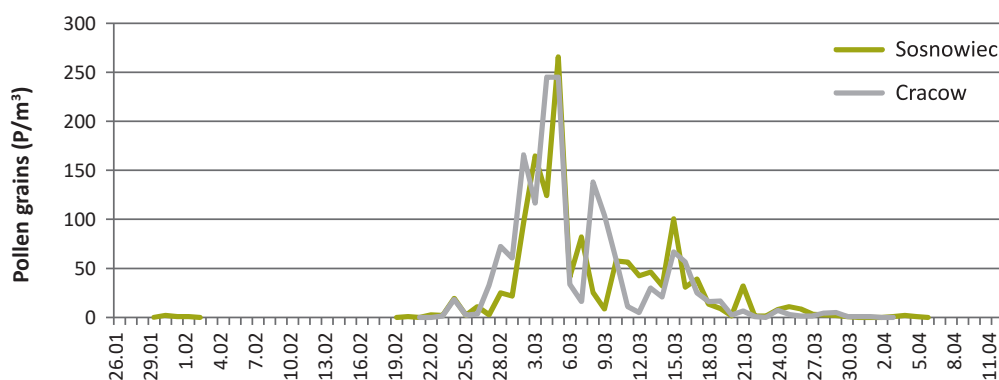
**Figure 1.** *Alnus* pollen count in Zielona Gora and Opole in 2017.



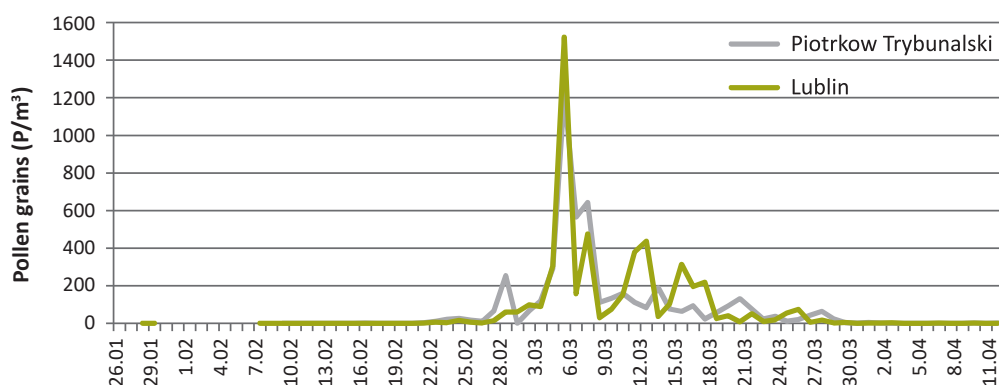
**Figure 2.** *Alnus* pollen count in Poznan and Wroclaw in 2017.



**Figure 3.** *Alnus* pollen count in Sosnowiec and Cracow in 2017.



**Figure 4.** *Alnus* pollen count in Piotrkow Trybunalski and Lublin in 2017.



2. The highest concentrations of alder pollen were recorded in Zielona Gora, Opole, and Poznan, whereas the lowest concentrations were noted for Sosnowiec and Cracow.
3. In all the cities, the maximum concentrations of alder pollen in 2017 were recorded on a similar date (4<sup>th</sup> or 5<sup>th</sup> March)
4. The greatest number of days with pollen concentrations exceeding the threshold value was recorded in Zielona Gora, Opole, and Piotrkow Trybunalski.

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#### Authors' contributions:

Piotrowska-Weryszko K.: 60%; and other Authors: 4.44% each.

#### Conflict of interest:

The authors declare that they have no competing interests.

#### Financial support:

Research in Opole, Piotrkow Trybunalski, Wrocław, Zielona Gora funded by Allergen Research Center Ltd. (Ośrodek Badania Alergenów Środowiskowych Sp. z o.o.).

#### 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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