

PGI and PU Team Developed the Pollen Calendar to Depict Seasonal Periodicities of Airborne Pollen Species and Prevent the Pollen Allergies

- The growing incidences of asthma, allergic rhinitis/hayfever, and other pollen-associated allergenic diseases have become an important issue in recent years.
- About 20-30% of the population suffers from allergic rhinitis/hayfever in India, and approximately 15% develop asthma. Pollens are considered major outdoor airborne allergens responsible for allergic rhinitis, asthma, and atopic dermatitis in humans.
- A team led by Dr. Ravindra Khaiwal at Department of Community Medicine and School of Public Health. PGIMER examined the seasonal periodicities of airborne pollen spectrum and developed the first Pollen Calendar for the city, Chandigarh.
- Pollen calendars represent the time dynamics of airborne pollen taxa in the graphical form present in a particular geographical area. They yield readily accessible visual details about various airborne pollen taxa present throughout the year, with their seasonality in a single picture. They are location-specific, with concentrations closely related to locally distributed flora.
- The study is recently published in Atmospheric Environment, which is a reputed peer-reviewed international journal by Elsevier. The team comprising of Dr. Ravindra Khaiwal at Department of Community Medicine and School of Public Health. PGIMER, Dr. Ashutosh Aggarwal, Professor and Head, Department of Pulmonary Medicine from PGIMER, Chandigarh, India and Dr. Suman Mor, Chairperson and Associate Professor including Ms. Akshi Goyal and Mr. Sahil Kumar, Research Scholar from Department of Environment Studies, Panjab University, Chandigarh, India.
- In the current study, the PU-PGI group has explored the main pollen seasons, their intensities, variations and aerobiologically significant pollen types in Chandigarh. The study revealed the first pollen calendar for Chandigarh to provide up-to-date information and highlight the variability of crucial pollen types in different seasons. The prominent airborne pollen dominating seasons were spring and autumn, with maximum species when the phenological and meteorological parameters are considered favorable for pollen grains' growth, dispersion, and transmission.
- Pollen calendar provides a clear understanding for clinicians as well as allergy sufferers to identify potential allergy triggers and help to limit their exposure during high pollen loads. The early advisories can be prepared and disseminated through media channels to the citizens so that they can use protective gear during the period when the concentration of allergic pollens will be high. It also corresponds as a preventive tool to sensitive people regarding diminishing exposure when the levels of aero-pollen are during high pollen load months. People can have access to the Pollen Calendar of Chandigarh through Care 4 Clean Air website (<https://www.care4cleanair.com/champ>).
- The Annual Pollen Integral (API) was 21,244 pollen grains/m³ in 2018-19 and 20,412 pollen grains/m³ in 2019-20. There was a high variability concerning total daily pollen concentration and two main pollen peak seasons in both years, i.e., February–April and August–October. During the months of February, March and April, the highest pollen

concentrations sometimes exceeded 800 pollen/m³. However, from May onwards, daily pollen counts began to decrease, with no new peaks appearing until August–October.

- The intensity of allergy is directly linked to the species and taxa of airborne pollen, which depends on the threshold value of the individual species. During the period of 2-year, a total of 74 different pollen taxa were identified in the atmosphere of Chandigarh. Out of these, 57 taxa were found to be arboreal and the 17 other taxa belong to non-arboreal plants.
- Eight key taxa that were identified as most abundant in the atmosphere of Chandigarh were:

Species	Local name	Month
Amaranthaceae/Chenopodiaceae	Amaranthaceae/Chenopodiaceae	Mar-apr, aug-oct
<i>Cannabis sativa</i>	Marijuana	Jan-nov
<i>Celtis occidentalis</i>	hackberry	Jan-apr
<i>Eucalyptus sp</i>	Safeda	Jan-june
<i>Morus alba</i>	white mulberry (Shahtoot)	Jan-apr
<i>Parthenium hysterophorus</i>	Congress grass	Jan-may and july
<i>Pinus sp.</i>	Pine	Jan-apr
Poaceae	Grass pollens	Jan-nov

Article Title: Pollen Calendar to depict seasonal periodicities of airborne pollen species in a city situated in Indo-Gangetic plain, India

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