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Allergenic pollen: is it also an indoor problem?

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To the editor

More than 150 million people in Europe suffer from allergic diseases [1]. Allergic respiratory diseases in the form of allergic rhinoconjunctivitis represent the most common allergic disease, with allergenic pollen representing the main elicitor. Although allergenic pollen is known and recognized as a health problem related to outdoor air, it is not considered an air pollutant in the meaning of the German Federal Immission Control Act, in contrast to airborne substances such as NO₂ and fine dust. As such, there is no legal obligation in Germany to measure pollen in outdoor air.

However, in view of the fact that humans spend a large part of their time indoors, indoor pollen levels may also be relevant to health [2, 3]. Despite this fact, only a handful of studies are available to date on indoor pollen levels. This “phenomenon” is not pollen-

specific: if one compares the large number of epidemiological studies on outdoor air pollution with the number of studies on indoor air quality, one notices that, apart from a few notable exceptions, the importance of indoor air quality has been virtually ignored [4]. Few available studies on indoor pollen suggest that various types of pollen—even outside the pollen season—can cause symptoms indoors (e.g., as a result of resuspension) [5]. The concentration of allergenic pollen in indoor air appears to be influenced by multiple factors, such as meteorological conditions, ventilation schemes, as well as the individuals using the rooms [6].

To systematically investigate indoor pollen levels and pollen components, one can draw upon the wealth of experience in the field of pollen monitoring in outdoor air. When focusing on indoor air, the following issues need to be systematically addressed:

- Simultaneous continuous monitoring of pollen concentrations in outdoor and indoor areas of relevant buildings in order to systematically determine the background pollen concentration in model rooms while taking into account building-specific and condition-specific parameters. Relatively small, continuously operational, and fully automated pollen counting systems (once their development is complete), for example, would be suitable for this measurement task. The deployment of individual pollen collectors and the use of symptom-focused questionnaires or symptom apps are also considered to be promising methods.
- Conducting systematic studies to differentiate between pollen count and indoor pollen allergen levels, e.g., by investigating indoor PM10 for pollen allergen content.

The systematic investigation of these issues can answer questions on the health-related significance of

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allergenic pollen indoors as well as on specific measures for the reduction of indoor pollen counts.

In the authors' opinion, the scientific investigation of these issues is both helpful and necessary, since merely correlating symptoms of allergic respiratory diseases with the outdoor pollen count is insufficient and can hamper the determination of appropriate protective measures. The detection of relevant indoor pollen levels may explain perennial symptoms in individuals without demonstrable sensitization to the usual indoor allergens (e.g., mites, animal hair, molds).

The aim of this communication is to find co-operation partners with an interest in this topic—please contact Prof. Karl-Christian Bergmann (karlchristian-bergmann@gmail.com).

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Conflict of interest K.-C. Bergmann, L. Klimek, S. Nehr, W. Straff and B. Werchan declare that they have no competing interests.

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