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New pollen power tool can improve forecasts

Instead of counting the number of pollen grains, researchers at the University of Gothenburg will measure the level of allergenic substances in the air. Their newly developed collection tool is reminiscent of a 1980s Hollywood film.

Every spring, allergy sufferers brace for the annual pollen season, relying on forecasts that estimate pollen counts in the air. But what if those forecasts could be even more accurate? Researchers from the Pollen Laboratory at the Department of Biological and Environmental Sciences at the University of Gothenburg, are working on a new approach that could improve pollen allergy forecasting – one that doesn't just count pollen grains but also measures the actual allergen they carry.

The research team, led by Nestor González Roldán, includes master's students Frida Gustafsson and Selma Softic, are developing a new method to improve pollen monitoring.

– Traditionally, pollen monitoring services report pollen grain counts per cubic meter of air and use a scale based on controlled exposure studies. However, this method does not measure the true allergenicity – because pollen grains themselves are not the problem, but rather the allergens they carry, says Nestor González Roldán.

Pollen counts not enough

Allergens are small proteins found on or inside pollen grains that trigger allergic reactions such as runny noses, itchy eyes, and asthma. But not all pollen grains contain the same amount of allergen. Environmental stress can cause trees to produce more or less allergen, meaning that pollen counts alone can be misleading when estimating allergy risk.

To address this, the research team is now measuring allergen levels per pollen grain and comparing this data with traditional pollen counts.

– Their goal is to develop a pollen allergenicity index, which could provide a much more precise forecast of allergy risk, says González Roldán.

To collect their samples, the researchers have developed an innovative tool—the "Pollenbuster", a modified portable vacuum cleaner adapted for capturing pollen that is ready to become airborne directly from the trees. Inspired by the Ghostbusters, the team has been spotted around Gothenburg and beyond, collecting pollen from trees.

The project started with alder trees, one of the main sources of allergenic pollen at the beginning of the season. Over time, they will expand their study to include birch trees and grasses, two other major contributors to pollen allergies.

Tracking Pollen to Its Source

In addition to measuring allergen content, the team is using back-trajectory analysis—a technique that allows them to trace pollen back to its most likely source. By combining allergen measurements with trajectory analysis, the researchers aim to:

- Identify known pollen "hot spots"
- Discover new sources of highly allergenic pollen
- Improve pollen forecasts by linking allergen concentrations to specific locations

Over the coming years, as they collect more data, their pollen allergenicity index will become an increasingly powerful tool for predicting allergy risk with greater accuracy than before.

So, if you see scientists around Gothenburg wielding vacuum cleaners—don't be alarmed! They're not hunting ghosts; they're on a mission to help allergy sufferers breathe easier.

contact for scientific information:

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Attachment The master student Frida Gustafsson uses the "Pollenbuster" to collect pollen from the trees.
http://idw-online.de/en/attachment109639

The master student Frida Gustafsson uses the "Pollenbuster" to collect pollen from the trees.
Photo: Olof Lönnehed

Nestor González Roldán is the leader of the research group that are developing a method for more precise forecast of allergy risk.
Photo: Olof Lönnehed