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**Key words:**

- methods of sampling
- pollen grains

**Słowa kluczowe:**

- metody pobierania materiału
- pyłek roślin

## Comparison of Sampling Efficiency between Filtration (low volume sampler) and Impaction (Hirst miniheads replicates) in a Wind Tunnel for Three Different Pollen Types: Poaceae, Ambrosia and Parietaria and Three Wind Speed Setups (1, 2 and 3 m/sec)

Porównanie skuteczności pobierania materiału pomiędzy metodą filtracji (aparaty o niskim przepływie) i uderzeniową (aparaty typu Hirsta) w tunelach powietrznych dla trzech różnych typów pyłku: Poaceae, Ambrosia i Parietaria oraz dla trzech prędkości wiatru (1, 2 i 3 m/sec)

No methodology has been designed specifically for trapping airborne pollen, so several methodologies which are used in airborne particle collection (Passive and Active) have been adapted for this purpose.

Most of these adaptations have not considered the differences in aerodynamic behaviour between pollen types and have overlooked the fact that these differences could lead to disproportionate representation in the pollen count due to the kind of sampler selected.

A wind tunnel experiment has been carried out at Rothamsted Institute with the aim of evaluate the relevance of this assumption. Three different pollen types (in size and shape): Gramineae (*Lolium perenne*, 35µm, smooth surface), Ambrosia (*Ambrosia elatior*, 25µm, spines over the surface) and Parietaria (*Parietaria judaica*, 15µm, smooth surface), were released in a wind tunnel under different sets of wind speed (1, 2 and 3 m/sec) and collected in a down facing glass fiber filter (40 mm) with a low volume sampler GS050/3-C (flow rate 3m<sup>3</sup>/h). Two miniheads designed to replicate the flow rate and orifice of a Hirst type sampler were situated at both sides of the filter holder, working simultaneously, in order to monitor the concentration of particles inside the wind tunnel. The sampling period was set to a 30 min run and 6 runs were performed for each wind speed set up. The position and concentration of each pollen type were recorded by microscopic analyses (x 400), and the results compared.

Approximately 95% of the pollen grains counted were found in an area of the filter placed opposite to the wind direction. The dimensions of the area covered and the position of the peak of concentration differ between pollen types and also differ between different wind speeds.

Parietaria pollen grains were found distributed more homogenously at low wind speeds than those of Gramineae and Ambrosia and also covered a bigger area of the filter. At 3 m/sec the distribution areas for all pollen types are reduced and concentrated in the edge of the filter opposite to the wind direction.

These results suggest that differences in aerodynamic properties between pollen types have the potential to affect the sampling efficiency of sampling methods. Therefore, this divergence in sampling efficiency for individual pollen types should be taken into consideration when applying pollen counts in assessing environment conditions of pollen exposure.