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Holography-based aerobiological monitoring: a 2-year intercomparison campaign versus the standard Hirst method in Brussels, Belgium.

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Around 10% of the Belgian population is allergic to the pollen emitted by trees of the Betulaceae family (birch, alder, hazel and hornbeam) and an estimated 18% to grass pollen. To prevent and treat respiratory symptoms and reduce the allergy burden, pollen grain concentrations have been continuously monitored using the standard Hirst method with a volumetric spore trap. However, this offline method can only provide results retrospectively, from 1 day to 1 week, and previous evaluation studies have shown certain limitations in terms of sampling efficiency and measurement accuracy.

Recently, several automatic real-time instruments have been developed to allow the identification and quantification of airborne pollen. After a 2-year campaign performed in Brussels (Belgium), daily concentrations of 13 pollen taxa measured by the Swisens Poleno Jupiter were compared to the measurements of the Hirst method. The highest intraseasonal correlation values between both methods were found for *Betula*, *Fraxinus* and *Poaceae*. While some pollen taxa showed similar seasonal kinetics but with scaling discrepancies, other pollen taxa frequently presented out-of-season false positive peaks as results from the automatic monitor. In all, the holography-based monitoring in real conditions appeared to be relatively reliable within the seasons of most allergenic pollen taxa. Further improvements are expected by training the identification algorithm with reference datasets generated from pollen collected in the local environment.

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