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First insights on APS-300 for airborne Olea pollen monitoring in the Mediterranean area

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Background: Airborne pollen monitoring depends on precise and reproducible pollen detection and analysis. In Europe, airborne pollen monitoring is done by manual counting, which is a labor-intensive and somewhat slow process. That is why there is a need for new automatic methodologies to solve these problems. Even though some significant work has been done with various degrees of success; however, there are still some problems in automatic pollen monitoring. In this study, we report on the field-testing outcomes in Cordoba, Spain, for a novel automated real-time pollen imaging sensor.
Methods: We first compared, with parallel measurements, the pollen concentrations measured by an automated real-time pollen sensor (APS-300, Pollen Sense LLC) and the manual Hirst-type spore-trap, from April 18, 2023, to May 15, 2023. Both samplers are located in the same station in Rabanales Campus, University of Cordoba, Spain. Second, we evaluated the quality of the retrieved pollen concentrations detected with both samplers.
Results: During the studied period, the APS-300 measured average daily pollen concentrations of 2129 (pollen grains/m3), while the Hirst-type trap recorded 1535 (pollen grains/m3). On April 27, the APS-300 recorded the greatest concentration of >9,000 pollen grains, whereas the Hirst-type trap recorded a peak concentration of >8,000 pollen grains. With r equal to 0.73, the daily *Olea* pollen concentrations obtained by both systems showed a highly significant correlation.
Conclusions: The mobile and real-time capabilities of APS-300 underscore its potential to monitor *Olea* pollen. It represents a significant improvement over manual counting methods in terms of time resolution and human efforts. However, further study is required to improve automatic pollen detection techniques.
Keywords: Automated, *Olea* pollen, comparative study, validation, pollen monitoring

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