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Differential Ole E 1 Release From *Olea* Airborne Pollen In Southwest Iberian Peninsula. Results From The HIALINE Study

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Background:

Ole e 1 is the major allergen of olive pollen (Olea europaea L.), the second largest cause of pollinosis in some areas from the Mediterranean Region. Although it has been assumed that airborne pollen is a representative parameter for allergen exposure, variability of allergen content and/or release from pollen has been demonstrated for other taxa. The aim of this study was to: i) estimate the correlation between daily airborne olive pollen and Ole e 1 in ambient air; ii) evaluate the annual and geographical variation of pollen and allergenic loads in southwest Iberian Peninsula; iii) evaluate the contribution of meteorological parameters to ambient Ole e 1 loads variations.

Methods:

Airborne Ole e 1 and olive pollen were assessed simultaneously in Cordoba, Spain and Evora, Portugal. Aeroallergens were collected in 2009-2011 using prewashed polyurethane foam as impacting substrate (Rupprecht & Patashnick ChemVol®2400 high-volume cascade impactor, Albany, NY, USA). Flow was adjusted to 800 L/min with a rotameter controlled high-volume pump (Digitel DHM-60, Ludesch, Austria). After extraction, Ole e 1 was quantified by ELISA. Airborne Olea pollen was monitored with a Burkard Hirst type Seven-Day Recording Volumetric SporeTrap®. Both samplers were placed side-by-side with the air input at the same level.

Results:

Figure 1: Pollen and allergen profiles olive.
In all the cases allergen followed the pollen profile but pollen counts were not representative for allergen loads; the same pollen counts yielded different amounts of allergen.

Figure 2: Allergen and Pollen loads.
The allergen and pollen loads presented geographical and annual variation, with considerably higher levels in Spain.

Figure 3: Pollen potency (allergen/pollen).
The mean allergen release per pollen grain presented geographical and annual variation; The latter was particularly important in Portugal.

Figure 4: Rain and annual pollen potency.
Cummulative precipitation (mm) previously to the pollen season are correlated with higher pollen potency, particularly in March or April.

Conclusions:

These results have shown that Ole e 1 is mostly associated with olive pollen grains but aeroallergen load was not always directly proportional to airborne pollen counts.
This suggests that Ole e 1 quantification is a better marker for olive allergen exposure. In conclusion, aeroallergen monitoring may contribute to a better understanding of the Ole e 1 exposure from airborne pollen.

Acknowledgments

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In relation to this presentation, I declare that there are no conflicts of interest.

Fig.1: Allergen and pollen profiles

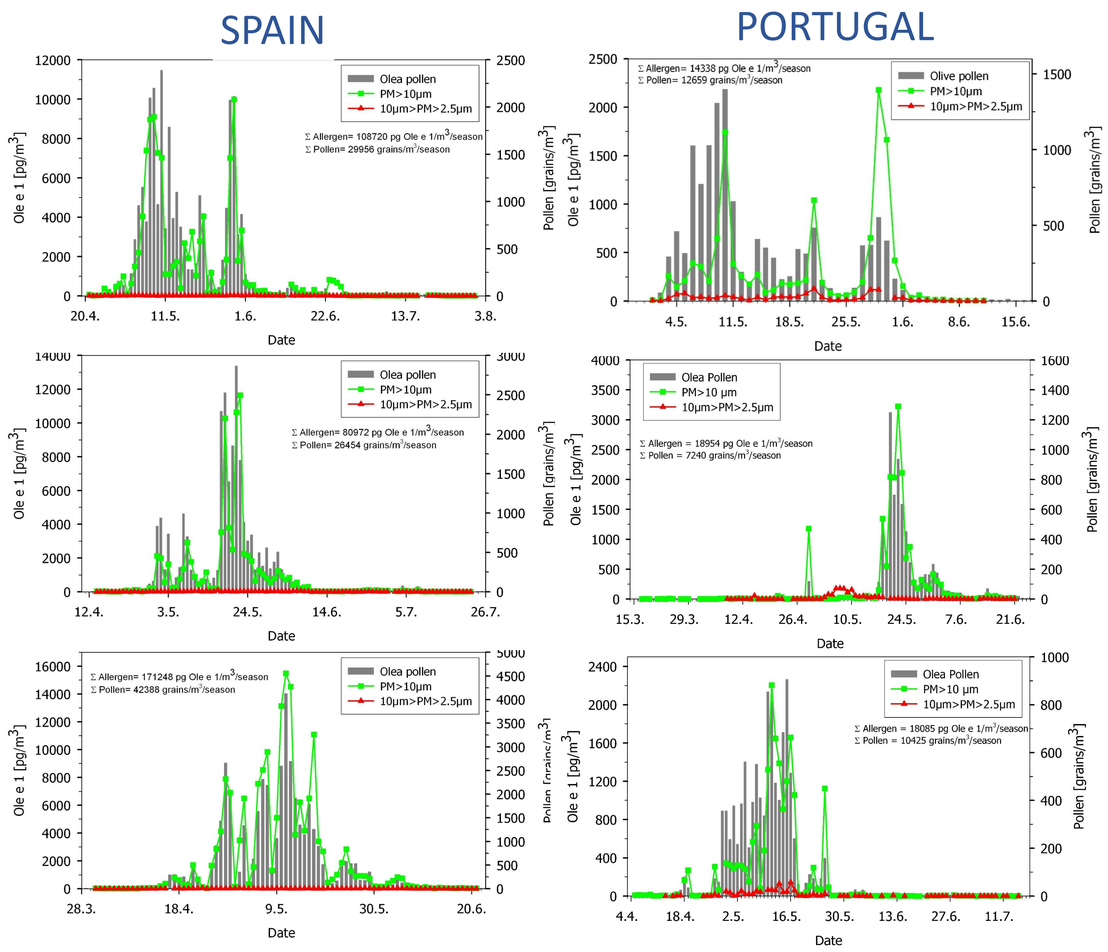

Fig.2: Allergen and pollen loads

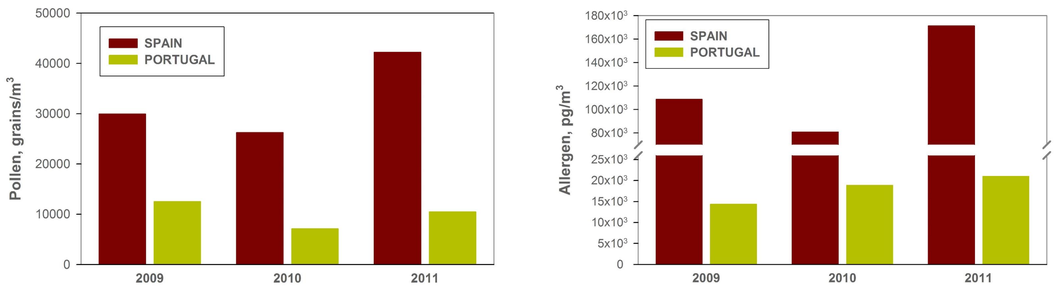

Fig. 3: Pollen potency

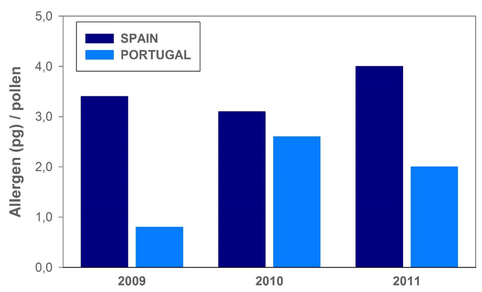

Fig. 4: Rain and annual pollen potency