

Olea europaea pollen grain levels and Ole e 1 aeroallergen concentrations in ambient air in Madrid, Spain during the 2009 and 2010 pollen seasons

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Background:

The inhalation of olive pollen is an important cause of allergic respiratory diseases in Spain and in other Mediterranean countries. Several allergens have been identified. Ole e 1 is an important allergen recognised by the majority of olive sensitized patients. It has been proposed that monitoring allergen levels is important to correlate allergic symptoms with pollen exposure. Cross-reactivity between *O. europaea*, *Fraxinus excelsior* and *Ligustrum vulgare* has been described.

Objective:

To establish Ole e 1 levels and correlate *Olea europaea* pollen grains and Ole e 1 concentrations in ambient air in Madrid, Spain, from March 2009 to July 2010.

Methods:

Hirst-type volumetric trap and Burkard Cyclone samplers were used for pollen counts and aeroallergen capture, respectively. The quantification of Ole e 1 allergens was performed using specific 2-site antibody ELISA (Bial; Bilbao, Spain).



Fig. 1. Hirst-type volumetric trap and Burkard Cyclone samplers. Particles were collected directly into a 1.5 mL Eppendorf vial.

Bibliography: Arilla, M.C et al. Monoclonal antibody-based method for measuring olive pollen major allergen Ole e 1. Ann Allergy Asthma Immunol 2002; 89: 83-89.

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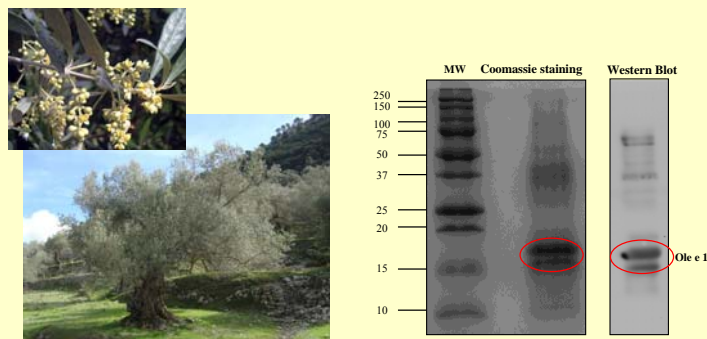


Fig. 2. A. *O. europaea* tree. B. Coomassie staining and immunoblot of an *O. europaea* pollen extract

Results:

Analysis of the pollen counts and Ole e 1 data by the Pearson rank test showed a good correlation between these two variables ($r = 0.70$, $p < 0.0001$). Before the *Olea europaea* pollen season, low allergen quantities which could be due to *F. excelsior* pollination, were detected. Main allergenic activity during 2009 was detected May 20th (pollen count: 520 grains/m³/d and Ole e 1: 5.69 ng/m³/d) and during 2010 on June 1st (pollen count: 250 grains/m³/d and Ole e 1: 3.78 ng/m³/d). Significantly higher pollen and allergen level were detected during the pollen season of 2009 (from May 5th to June 16th, mean pollen counts: 95 grains/m³/d) versus 2010 (from May 19th to June 30th, mean pollen counts: 19 grains/m³/d) ($p < 0.001$).

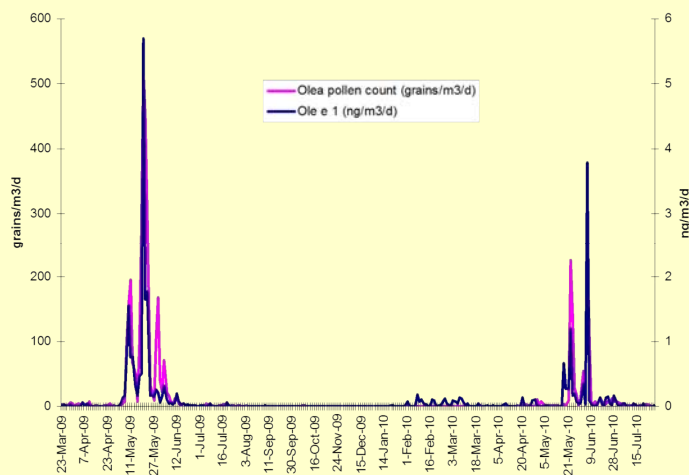


Fig. 3. Ole e 1 appearance and *Olea* pollen counts (2009-2010).

Conclusions:

1. The atmospheric presence of Ole e 1 is restricted to the period of *O. europaea* pollen in the air.
2. *O. europaea* pollen counts and Ole e 1 determinations are reliable estimates of olive pollen exposure in Madrid.
3. Significant differences in annual pollen counts and allergen levels were observed between the two study years.