



Lol p 5 IN THE BIOAEROSOL OF VALLADOLID (SPAIN) AND ITS IMPLICATIONS ON PUBLIC HEALTH

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Introduction

The grass pollen allergen is the most important in the world and the leading cause of pollinosis. Lol p 5 belongs to the group 5 allergens of grasses and it has ribonucleasa activity. This study aims to investigate the relationship between the atmospheric concentration of Lol p 5 aeroallergen, the *Poaceae* pollen and the different air pollutants in the city of Valladolid (Spain).

Material and Methods

The pollen sampling was carried out using a Hirst-type volumetric trap (Lanzoni©) for pollen grains and a Burkard Cyclone sampler (Burkard©) to analyze Lol p 5 allergen over a period of 3 years (2009-2011). The samples of pollen were prepared and analysed following the procedure recommended by the Spanish Aerobiology Network and allergens were analysed following ELISA sandwich "DAS", with some modifications.

Air pollutant (PM₁₀, PM_{2,5}, NO and NO₂, carbon monoxide, sulfur dioxide, ozone and benzene) levels data have been provided by the Valladolid Air Pollution Control Network.

Results and Discussion

Poaceae pollen represented the 4.2%, the 10.4% and the 8.9% of the total pollen in the years 2009, 2010 and 2011, respectively. *Poaceae* pollen had an increased presence during the months of May, June and July.

Almost all of Lol p 5 was detected in the fortnight between the May 20 to June 4 in the three years of study and a different number of days in each year (46 in 2009, 60 in 2010 and 30 days in 2011). The aeroallergen Lol p 5 and grass pollen have a significant and positive correlation coefficients.

The aerobiological dynamics of Lol p 5 and particulate matter and nitrogen oxides are quite alike, particularly during the *Poaceae* pollination period.

The higher concentrations of Lol p 5 have been recorded when ozone levels decreased, which has been shown by others studies (Albertine *et al.*, 2014). High concentrations of sulfur dioxide were able to inhibit the release of Lol p 5 in 2011, which has been shown in studies in vitro (Behrendt *et al.*, 1997; Sousa *et al.*, 2012; Cuinica *et al.*, 2013, 2014).

Conclusions

Poaceae pollen was the most important of herbaceous plants pollen type in the atmosphere of the city of Valladolid. The higher levels of Lol p 5 are produced with a high concentration of *Poaceae* pollen. The last days of May and the first week of June may be considered periods of risk to human health. The influences of meteorological variables and air pollutants on pollen and allergenic proteins must be taken into account together due to atmospheric photochemical reactions.