Detection and Quantification of Grass and *Olea* Airborne Pollen Allergens in Outdoor Air Samples and its Correlation with Pollen Counts

R Ferro[1*], R Ribeiro[1*], MR Martins[1,2], AT Caldeira[1,3], E Caeiro[6], CM Antunes[1,5] & R Brandão[2,4] and the HIALINE working group[7]

[1]*Dep. of Chemistry, University of Evora, Portugal;*

[2]*Mediterranean Inst. Crop and Environment Sciences, Univ.Evora, Portugal;*

[3]*Centro Química, University of Évora, Portugal;*

[4]*Dep. Biology, University of Evora;*

[5]*Center for NeuroSciences and Cell Biology-University of Coimbra, Portugal;*

[6]Soc.Portuguesa Alergol.Imunologia Clínica *, Portugal*

[7] M. Thibaudon, France, M. Smith, United Kingdom, C. Galan, Spain R. Albertini, Italy, L. Grewling, Poland, G. Reese, Germany, A. Rantio-Lehtimäki, Finland, S. Jäger and U. Berger, Austria, M. Sofiev, Finland, I. Sauliene, Lithuania, L. Cecchi, Italy

Presenting author: ruibrand@uevora.pt tel: +351 266760889

Introduction: Allergic respiratory diseases broken out after an exposure to airborne pollen, as asthma and allergic rhinitis, are deeply increasing and they represent one of the major public health problems nowadays, affecting about 40% of European population. In Portugal, grass and *Olea europaea* pollen are certainly one of the main sources of athmospheric aeroallergens and as such, one of the main causes of respiratory allergy.

For these reasons, it is useful the development of new strategies for prevention and treatment of these pathologies. The execution of aerobiological analysis including pollen calendars and/or immunoassays for the detection and quantification of allergens which could forecast the allergenic potential of the athmosphere are quite relevant since they would contribute to develop prevention measures of allergic respiratory diseases. The aim of this study was to evaluate the putative correlation between the concentration of some of the major allergens of and with their pollen counts.

Methodology: On a meteorological platform at the town center of Evora (south Portugal), ambient air was sampled at 800L/min with a Chemvol high-volume cascade impactor equipped with stages PM>10µm, 10 µm>PM>2.5µm. The polyurethane impacting substrate was extracted with 0.1M NH_4HCO_3, pH8.1, supplemented with 0.1% BSA. The major pollen allergens from grass Phleum p 5 and olive Ole e 1 were determined with allergen specific ELISA´s. Airborne pollen of and *Olea europaea* simultaneously monitored with a Burkard Seven Day Recording Volumetric Spore Trap® , between the 30th of April and the 8th of July of 2009. Both samplers were placed side-by-side with air input at the same level.

Results: During the pollen season of 2009, high values of grass pollen were recorded between May 2th and June 1 th. It was also observed that the air content of *Phl* p5 or *Ole* e1 aeroallergens were directly correlated with airborne pollen counts of *Poaceae* and *Oleaceae*, respectively.

Conclusions: These results suggest that the directly quantification of aeroallergens may contribute, together with pollen counts of air samples, to define the allergic risk with higher precision.

Acknowledgments: This study is integrated in the european project HIALINE (Executive Agency for Health and Consumers under grant agreement No 2008 11 07)