Identification of a basic Polygalacturonase as a major Cupressus sempervirens pollen allergen

SHAHALI Yusof, SUTRA Jean-Pierre, HADDAD Iman, VINH Joëlle, MARI Adriano, CHOLLET-MARTIN Sylvie, CHARPIN Denis, PELTRE Gabriel, SÉNÉCHAL Hélène, PONCET Pascal


INTRODUCTION

In Mediterranean countries, the common cypress currently constitutes the major source of winter/early spring respiratory allergy reaching up to 40% of the annual pollen spectrum in some cities surrounding the Mediterranean basin. Although polygalacturonases (PGs) represent major allergens in several Cupressaceae pollen grains, no protein from this family has been reported and identified in cypress (Cupressus) species pollen so far.

OBJECTIVE

In the present study, aimed at identifying the main allergens implicated in the cypress pollen allergy using an immuno-proteomic approach, we investigate the presence of an allergen homologous to already characterized Cupressaceae PGs in common cypress (Cupressus sempervirens) pollen.

METHODS

The present study describes a new procedure based on double one-dimensional gel electrophoresis (1-DE) for the identification and characterization of allergenic components present in a complex pollen extract. By converting a protein spot previously visualized by 2-DE to an extended protein band, 1-DE circumvents the very low-abundance of some allergenic proteins detected by 2-DE immunoblots. We used this technique for a multiplexed IgE immunoblotting using sera from 30 cypress pollen allergic patients. Moreover, the whole 1-DE protein band can then be excised, digested and processed for MS/MS or microsequencing analysis making protein identification more convenient.

CONCLUSIONS

The present study shows that cypress pollen PBS extracts include not only Cup s 1 but also basic allergens homologous to Cupressaceae PGs and rubber elongation factor. IgE-binding to the 43 kDa PG involves bromelain-type glycan epitopes what is not the case for other basic allergens of 14 and 60 kDa. The identification and characterization of these components open new perspectives in the diagnosis and therapy of the cypress pollen allergy.