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Sensitization profiles to purified plant food allergens among pediatric patients with allergy to banana.

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Abstract

Banana fruit allergy is well known, but neither immunoglobulin E recognition patterns to purified plant food allergens nor true prevalences of putative banana allergens have been established. This study aimed to characterize β -1,3-glucanase and thaumatin-like protein (TLP) as banana allergens, testing them, together with other plant food allergens, in 51 children with allergic reactions after banana ingestion and both positive specific IgE and skin prick test (SPT) to banana. Banana β -1,3-glucanase and TLP were isolated and characterized. Both banana allergens, together with kiwifruit TLP Act d 2, avocado class I chitinase Pers a 1, palm pollen profilin Pho d 2 and peach fruit lipid transfer protein (LTP) Pru p 3, were tested by in vitro and in vivo assays. Banana β -1,3-glucanase (Mus a 5) was glycosylated, whereas banana TLP (Mus a 4) was not, in contrast with its homologous kiwi allergen Act d 2. Specific IgE to both banana allergens, as well as to peach Pru p 3, was found in over 70% of sera from banana-allergic children, and Mus a 4 and Pru p 3 provoked positive SPT responses in 6 of the 12 tested patients, whereas Mus a 5 in only one of them. Both peptidic epitopes and cross-reactive carbohydrate determinants were involved in the IgE-binding to Mus a 5, whereas cross-reactivity between Mus a 4 and Act d 2 was only based on common IgE protein epitopes. Profilin Pho d 2 elicited a relevant proportion of positive responses on in vitro (41%) and in vivo (58%) tests. Therefore, Mus a 4 and LTP behave as major banana allergens in the study population, and profilin seems to be also a relevant allergen. Mus a 5 is an equivocal allergenic protein, showing high IgE-binding to its attached complex glycan, and low in vivo potency.

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