

A CLINICAL CASE OF PAPRIKA ALLERGY

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ABSTRACT

We report on a patient with a paprika and bell pepper allergy. This study shows two bands of 20–25 kDa and 30–35 kDa that could correspond to Cap a 1 (thaumatin) and glucanase respectively. The patient, who is a cooking assistant in a restaurant, suffers from rhinoconjunctivitis at her place of work, where she usually handles paprika. It is noteworthy that Cap a 1 was described as an allergen responsible for occupational asthma in previous cases.

Keywords: bell pepper, paprika, allergy, rhinoconjunctivitis, urticaria

INTRODUCTION

Paprika, red pepper or pimentón is a spice obtained from dried and ground bell pepper or sweet pepper (*capsicum annum*), that belongs to *capsicum* species *familiae*. Pimentón or paprika is an ingredient of many typical Spanish meals and in other European countries such as Hungary, Montenegro and Serbia. Some confusion could arise about the term ‘pepper’ – black, white or green pepper are different spices, obtained from *piperaceae* *familiae* plants.

Few cases of paprika or bell pepper allergy have been published:¹ most of them have been associated with a latex–fruit syndrome.^{2,3,4} In these cases there have been some cross-reactive allergic components present in both latex and bell peppers: 12 kDa profilin, 35 kDa beta-1.3-glucanase, 30 kDa L-ascorbate peroxidase, 20 kDa prohevein and 46 kDa patatin.

Very few cases of paprika as occupational allergen have been described^{5,6} and 5 kDa Defensin J1 and 52 kDa storage protein Vicilin were the allergens found to be involved.⁶

CLINICAL CASE

We report on a 26-year-old patient diagnosed previously with hypothyroidism that was treated with thyroxine once a day, who attended the Allergy Department of the Hospital de León, León, Spain. The patient presented with symptoms of sneezing, ear and mouth itching, and lip oedema after taking in processed salami seasoned with paprika – known in Spain as ‘chorizo’. In addition, 20 minutes after the ingestion of bell pepper, she also described mouth itching and generalised urticaria. Moreover, at this time, she worked as a kitchen assistant and from a few months before to her medical visit, she noticed work-related rhinoconjunctivitis, which improved when she was on holiday and not at work. She did not experience allergic symptoms in response to latex and did not describe any other food allergies.

METHODS

SKIN-PRICK TEST

Skin-prick tests (SPTs) were performed using commercial allergenic extracts of *Iolium perenne*, *Artemisia vulgaris*, *plantago lanceolata*, *alternaria alternata*, *aspergillus fumigatus*, *dermatophagoides farinae*, *dermatophagoides pteronyssinus*, *lepidoglyphus destructor*, dog, cat, latex, profilin, peach lipid-transfer protein, wheal, and soy flour marketed by ALK-Abelló (ALK-Abelló, Madrid, Spain); potato, barley flour, tomato and black pepper (Laboratorios Leti SLU, Barcelona, Spain) and rye flour (Roxall Medicina España SA, Zamudio, Spain).

In order to perform the prick-to-prick test, the patient provided commercial paprika and cayenne and raw/fresh and boiled foods included in the *solanaceae* family and others handled at work (bell pepper, tomato, eggplant, potato, basil, oregano, parsley, rosemary, saffron, thyme, black pepper).

SEROLOGICAL IgE DETERMINATION

Total and specific IgE were determined using the ImmunoCAP system (Thermo Fisher Scientific) according to the manufacturer’s instructions. Specific IgE above 0.15 kU/L was considered positive.

EXTRACTS

A homemade extract of commercial paprika (Pimentón Agridulce El Rey de La Vera, Caceres, Spain) was prepared in a phosphate buffer at 10% (w/v) and kept for 90 min at 4°C with magnetic stirring. The extract was then centrifuged and filtered and glycerin was added to stabilise it.

IgE-IMMUNOBLOTTING

The extract and the molecular weight marker were analysed by Trycin SDS-PAGE under non-reducing conditions. The different proteins separated were then transferred onto nitrocellulose membranes. Immunoblotting of IgE-binding proteins was achieved by enhanced chemiluminescence according to the manufacturer’s instructions (ECL-Amersham Bioscience). The blots were also incubated with dilution buffer as a negative control.

RESULTS

Specific IgE: peach LTP (r Pru p3): 1.18 kU/L, tomato: 0.82 kU/L, potato: 0.62 kU/L, paprika: 0.34 kU/L, eggplant: 0.26 kU/L, chili pepper: 0.20 kU/L. IgE was negative to peach PR10, peach profilin, black pepper and green pepper.

Total IgE: 69.1 UI/mL.

Prick test: Corn flour – 10 mm, peach – 5 mm, tomato – 6 mm, histamine – 7 mm, regular saline – negative. Prick tests were negative to pollens, moulds, mites and pets, peach profilin, barley flour, wheat flour and rubber (as illustrated in Table I).

TABLE I: PRICK-TESTS

Corn flour	10 mm
Peach	5 mm
IgM (gr/L)	6 mm
Histamine	7 mm
Saline solution	0

Prick-to-prick: Paprika – 8 mm, cayenne – 10 mm, boiled cayenne – 8 mm, raw bell pepper – 10 mm, boiled bell pepper – 8 mm, raw tomato – 8 mm, boiled tomato – 3 mm, raw eggplant – 7 mm, boiled eggplant – 5 mm, parsley – 7 mm, histamine – 7 mm, saline solution – negative.

TABLE II: PRICK-TO-PRICK TESTS

Paprika	8 mm
Cayenne	10 mm
Boiled cayenne	8 mm
Raw bell pepper	10 mm
Boiled bell pepper	8 mm
Raw tomato	8 mm
Boiled tomato	3 mm
Raw eggplant	7 mm
Boiled eggplant	5 mm
Parsley	7 mm
Histamine	7 mm
Saline solution	0

Prick-to-pricks were negative to oregano, basil, potato, rosemary, saffron, thyme and black pepper (as illustrated in Table II).

IgE immunodetection-Immunoblotting showed a main IgE-binding band of 20–25 kDa that could correspond to the already described Cap a 1, and others less intense in a range of 37–45 kDa that could be glucanases, as well as the 45 kDa allergen involved in the Artemisia–Spice syndrome.¹

DISCUSSION

We report a new case of bell pepper allergy associated with the intake of both paprika (Pimentón) and bell pepper. Allergy to rubber and latex was ruled out in this patient. Paprika is commonly used in Spain for seasoning of salami (chorizo) and a variety of marinades, sauces and stir-fries. It is a common hidden allergen in a variety of foods.

It is noteworthy that the patient worked as a kitchen assistant and was exposed to paprika frequently, and also to tomato, bell pepper and parsley by both environmental inhalation and contact. Because the food-allergic reaction was preceded by a work-related history of rhinoconjunctivitis in the preceding months, one could speculate that the occupational exposure may have been the route of sensitisation in this case.

In this case, the responsible protein detected by immunoblotting had a molecular weight (MW) which could correspond to a Thaumatin-like PR-5 protein, Cap a 1. Thaumatin has already been reported to be responsible for occupational allergen asthma in bakers, carpenters and workers handling olive flour.^{7,8,9} This could support the idea of the occupational sensitising route in this patient.

CONCLUSION

We found a paprika-allergic patient sensitised to a protein with a similar MW of the Thaumatin-like Cap a 1, with occupational rhinoconjunctivitis and an allergic reaction after the intake of paprika-containing foods.

DECLARATION OF CONFLICT OF INTEREST

The authors declare no conflict of interest.

This article has been peer reviewed.

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