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Allergology International

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Letter to the Editor

Generalized urticaria caused by ingestion of sweet potato cake

Dear Editor,

Sweet potato (*Ipomoea batatas*), belongs to the Morning glory family (*convolvulaceae* family).¹ Sweet potatoes are a staple food of many peoples of the tropics, but in the industrialized countries are mainly consumed as vegetable or a dessert.

We report the case of a 33-year-old woman, with previous history of food allergy to rice, peach, lettuce, nuts, mustard, grape, mango fruit by sensitization to lipid transfer protein (LTP), and rhinitis by pollen of olive and grasses, who developed generalized urticaria without another symptoms, some minutes after eating only a piece of sweet potato cake containing sweet potato, olive oil, egg, cinnamon, alcohol, sugar and wheat flour. The symptoms disappeared in hours after treatment with parenteral corticosteroids and antihistamines. The patient did not need adrenaline administration. The reaction was not related to exercise, alcohol or intake of drugs. The patient has tolerated all the ingredients of the cake after this episode, except sweet potato which was avoided.

Sweet potato extract was prepared from the sweet potatoes that had caused the allergic reaction in the patient. They were dissolved in phosphate buffer solution and the proteins were subsequently extracted overnight at 4 °C with constant stirring. After centrifugation (15 000 g for 60 min), the supernatant was isolated, dialyzed against water and later lyophilized. Protein concentration

was determined according the method of Bradford,² and the antigenic and allergenic profile by SDS-PAGE³ and Western blot.⁴ Serum specific IgE (ImmunoCAP) to sweet potato was negative, nevertheless the proteins of the sweet potato allergenic extract were biotinylated according to Sander *et al.*⁵ and linked to the streptavidin- ImmunoCAP revealing a weak positive result (0.39 kU/L). Skin prick test (SPT) with an extract of sweet potato (Diater Laboratories) was negative. The patient refused a challenge test with sweet potato, but a passive histamine release test (HRT), was carried out with an 'IgE-stripped' donor blood sensitized by patient serum, and stimulated with a non-interfered quantity of sweet-potato (500 ng/mL), and basophil histamine release was determined fluorometrically in the HISTAREADER TM 501 (RefLab).^{6,7} See Figure 1.

In the SDS-PAGE assay, the sweet potato extract contained several protein bands: 12, 14–15, 20, 22, 25, 30 y 50 kDa. However, this analysis of a sweet potato extract showed the absence of bands of similar molecular weight than Pru p 3. Immunoblotting analysis detected allergenic bands of 15 and 24 KDa. See Figure 2.

The isolated 24-kDa band revealed by the patient's serum was sent to the Proteomic Unit of the Complutense University (Madrid, Spain) for identification using MASS Spectrometry.

Sweet potato has been identified as the cause of infantile food protein-induced enterocolitis syndrome (FPIES).⁸ In 2004, Velloso *et al* published three cases of IgE-mediated allergic reactions to

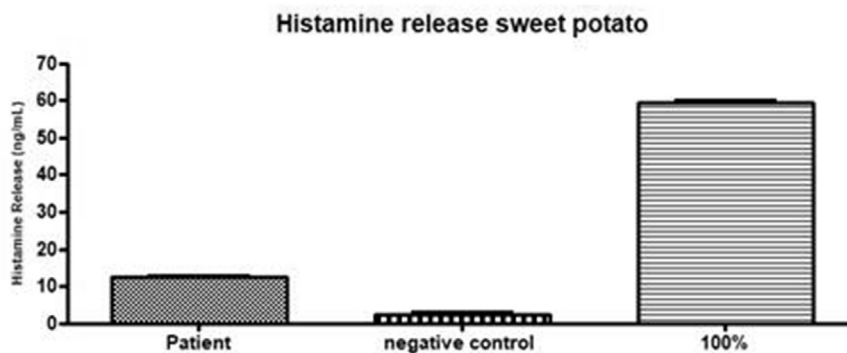


Fig. 1. Basophil histamine release assay with sweet potato and serum of the allergic patient and a negative control.

Peer review under responsibility of Japanese Society of Allergy.

<https://doi.org/10.1016/j.alit.2018.04.005>

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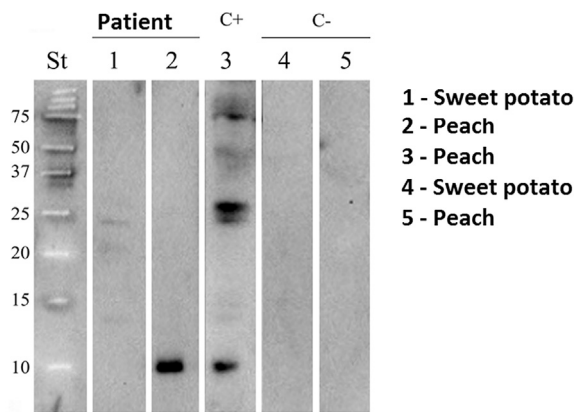


Fig. 2. Immunoblotting of sweet potato extract using sera from the allergic patient.

sweet potato.⁹ The authors detected allergenic bands of 54–64, 19–24 and 74 kDa by immunoblotting. However, these bands were not identified. Currently, no allergens have been identified from *I. batatas*. In our study the identification of protein bands by mass spectrometry recognized one allergen around 24 kDa no described up-to-date, a sporamin A protein. It is an inhibitor of trypsin. The mature proteins comprised about 180.¹⁰ All of the sequences contained four cysteine residues in conserved positions. Sporamin have numerous roles (storage, defense and regulation of endogenous proteinases) in tuberous roots and a single defense role in leaves and stems.¹¹

In summary, we have reported the case of a patient with IgE-mediated allergy to sweet potato, who was sensitized to two allergenic bands of 15 and 24 kDa. To our knowledge, this is the first report to identify an allergen no described up-to-date in sweet potato (*I. batatas*). This allergen is a sporamin A protein.

Conflicts of interest

FP and MC are employees of Diater Laboratories. The rest of the authors have no conflict of interest.

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Received 9 January 2018

Received in revised form 1 March 2018

Accepted 2 April 2018

Available online xxx