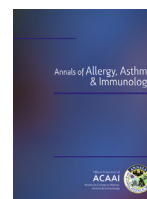




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Letter

The mamey sapote fruit (*Pouteria sapota*) as a novel cause of IgE-mediated allergic reaction

The mamey sapote fruit (*Pouteria sapota*) is a round to ovoid fruit with a firm, leathery rind with salmon-pink to red flesh and 1 to 4 large spindle shaped seeds (Fig 1). It is commonly found in Central America, where it is generally consumed raw, although it also can be prepared into ice creams or jams. It is usually harvested in the spring through early autumn.¹ To our knowledge, it has not previously been reported to cause allergic reactions of any type.

A 65-year-old woman presented after having an adverse reaction associated with food. She ate dinner and then ate the flesh of a whole mamey sapote fruit. Approximately 15 minutes later, she noticed mouth and throat numbness, bilateral eyelid swelling, and pruritus of her palms and soles. Then, she noticed mild difficulty swallowing, with slight voice change and coughing. She self-medicated with 50 mg of diphenhydramine and her symptoms gradually resolved. She denied shortness of breath, wheezing, dizziness, nausea, or vomiting at the time of the episode. During the following days, she tried her leftover food from dinner (pork ribs and vegetables) and did not notice a reaction. She denied consuming alcohol the day of the reaction. One week after the initial episode, she tried a small spoonful of the mamey sapote fruit and within 5 minutes had bilateral eyelid swelling without oral symptoms. She again took diphenhydramine, and her symptoms resolved.

The last time she ate this fruit was approximately 1 year previously. On average, she eats them several times a year when they are in season. She denied a history of any symptoms with previous ingestion.

She had no history of food allergy, although she did have a history of latex allergy. Five years previously, she was evaluated for several episodes of eyelid swelling and facial urticaria after eating at work. She worked as a dental assistant and was exposed to natural latex gloves at the time. Her latex specific IgE level was 0.47 kU_A/L at the time. She avoided subsequent latex exposure and did not have any recurrence of symptoms in the 5-year interim. She did not have a history of urticaria or angioedema outside beyond these episodes or a history of asthma. She did have allergic rhinitis that was worse in the late spring and summer, which was controlled with oral antihistamines. Previous specific IgE testing showed positive reactions to grass, weeds, olive tree pollen, and elm tree pollen. Family history was negative for food or environmental allergies.

After obtaining informed consent, allergy percutaneous skin testing was performed with prick-to-prick testing of fresh mamey sapote fruit pulp (whole fruit brought in by patient) and, given her history of latex allergy, an aliquot of natural rubber latex glove fragments soaked in sterile saline for 1 hour. The test reaction to

mamey sapote fruit was positive (7- × 8-mm wheal, 25- × 25-mm flare), whereas the test reaction to latex was negative (0-mm wheal, 5- × 5-mm flare). The histamine control reaction produced an 8- × 8-mm wheal and a 20- × 25-mm flare, and the negative saline control reaction produced a 0-mm wheal and a 1- × 1-mm flare. A control patient had a negative skin test reaction to the fruit pulp.

To confirm the results, a slurry of fresh mamey sapote fruit pulp was biotinylated using the EZ-Link Sulfo-NHS-LC-Biotin kit according to the manufacturer's instructions (Pierce Biotechnology, Thermo Scientific, Rockford, Illinois) and bound to a streptavidin ImmunoCAP assay (Phadia US Inc, Portage, Michigan) as previously described.² This resulted in a serum specific IgE measurement of 0.11 kU_A/L. The solution was concentrated further by centrifuging using an Amicon Ultra centrifugal filter (EMD Millipore, Billerica, Massachusetts) to separate the solution into a filtrated fraction consisting of proteins with a molecular weight of 1 to 5 kDa and an enriched fraction consisting of proteins with a molecular weight greater than 5 kDa. The filtrated fraction resulted in a specific IgE measurement lower than 0.10 kU_A/L, and the enriched fraction had a specific IgE measurement of 0.39 kU_A/L. Serum IgE testing to latex using a commercially available ImmunoCAP assay yielded a negative reaction (<0.10 kU_A/L).

To characterize the allergenic protein further, an immunoblot was performed with the mamey sapote fruit extract and the patient's serum. Briefly, mamey sapote pulp crude extract was analyzed by electrophoresis on a 4% to 20% sodium



Figure 1. Mamey sapote fruit (*Pouteria sapota*) cut with view of interior (photograph by Angelina Crans Yoon, MD).

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dodecylsulfate polyacrylamide electrophoretic gel, transferred onto a nitrocellulose membrane, and incubated with the patient's serum and then with horseradish peroxidase–conjugated goat antihuman IgE antibody (Sigma-Aldrich, St Louis, Missouri). Then, Luminata horseradish peroxidase substrate (EMD Millipore) was used to develop the film. A putative protein was detected at 81 kDa. To assess for potential cross-reactivity, sensitization to PR-10 (measured by Ara h 8), lipid transfer protein (measured by Ara h 9), and profilin (measured by Bet v 2) by a commercially available ImmunoCAP assay yielded a level lower than 0.10 kU_A/L.

Interestingly, the patient's history of similar reactions after exposure to latex provided a possible connection between mamey sapote allergy and latex allergy. However, because of the negative IgE and skin prick testing reactions to latex at the time of the mamey sapote reaction and negative reaction to profilin specific IgE, the reactions were less likely to be cross-allergenic in this case.

In the same family Sapotaceae, *Manilkara zapota*, commonly known as the sapodilla, has been reported to cause oral allergy syndrome. Molecular studies have shown that it has basic thaumatin-like proteins 1 and 2, which match significantly with allergenic thaumatin-like proteins from olive, kiwi, bell pepper, and banana.^{3,4} Owing to the large size of the protein identified in our study, it is unlikely to have similar cross-reactivity because the thaumatin-like proteins previously identified were approximately 25 kDa.

We report a systemic allergic reaction from mamey sapote fruit. As more tropical fruits are consumed in the United States, it is important to be aware that they can cause IgE-mediated adverse reactions.

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