



Letter

Anaphylaxis to quinoa

Quinoa, *Chenopodium quinoa* Willd., is a plant that originated in the Andean region of Bolivia and Peru.¹ It is often eaten in the United States as a supplement for other grains. However, quinoa is actually a fruit and has been called a pseudo-cereal.¹ The most common use of quinoa is the consumption of its seeds. The protein content in quinoa ranges from 13.8% to 16.5%.¹

We present a case of quinoa allergy diagnosed in our clinic. A 29-year-old woman presented for evaluation of food allergy after developing lip angioedema, pruritis of her palms and soles, "choking" sensation, and urticaria on her arms and chest, within 5 minutes of eating a quinoa salad. The salad included quinoa, red and green pepper, pineapple, orange, sweet and sour sauce, thai chili sauce, and plum sauce. The patient's medical history included lip angioedema after ingesting poultry on 2 separate occasions, once in 2009 and again in 2010, intermittent asthma, and allergic rhinitis elicited by dogs and cats. During the initial visit the patient underwent skin prick testing (SPT) to common St. Louis inhalant allergens, corn, ginger, orange, green pepper, black pepper, pineapple, soybean, and wheat. The SPT was positive to pineapple with a wheal diameter of 6 mm, to soy with a wheal diameter of 5 mm, and to cat and dog with a wheal diameter of 8 mm.

Given these results, our patient was advised to strictly avoid pineapple, soy, and poultry. Approximately 1 month after the visit, the patient called to inform us that she developed a feeling of "throat fullness," lip angioedema, and nausea within several minutes of eating plain quinoa. Symptoms resolved with an oral antihistamine. The patient was instructed to avoid quinoa and return to clinic for SPT.

We prepared the quinoa extract used for skin prick testing in our laboratory. We first ground the quinoa seeds with a mortar and pestle to increase the surface area of the quinoa grain and break up the cell membrane. We then mixed 1 g quinoa with acetone to defat the product. This step was repeated twice. Once the acetone was decanted, we allowed the quinoa to dry for 24 hours. We then started the extraction process to remove the active allergenic components from the quinoa and suspend them in a solvent. The

quinoa was soaked in Coca's Solution, prepared in our laboratory, for 48 hours at 4°C on a shaker at low speed.² We filtered the solution, using a Whatman 0.2 μ m PSU Media filter, and then diluted the solution with glycerin to a final concentration of 1:20.

The patient returned for skin prick testing and was found to be skin test positive to quinoa with a wheal diameter of 7 mm and to chicken with a wheal diameter of 5 mm. We also tested the quinoa extract on 3 control subjects. All 3 subjects had a negative response to quinoa and a positive histamine control. To the best of our knowledge, this is the first report of quinoa allergy within the United States. We came across 1 case report describing quinoa allergy in a 52-year-old man in France.³ Quinoa has become a more popular food within the continental United States, found on restaurant menus and in local food stores. This case report emphasizes the consideration of quinoa allergy in patients who present with anaphylaxis when quinoa has been ingested.

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References

- [1] Vega-Gálvez A, Miranda M, Vergara J, Uribe E, Puente L, Martínez EA, et al. Nutrition facts and functional potential of quinoa (*Chenopodium quinoa* willd.), an ancient Andean grain: a review. *J Sci Food Agric*. 2010;90:2541–2547.
- [2] Sheldon JM, Lovell RG, Mathews KP. *A Manual of Clinical Allergy*. Philadelphia: W.B. Saunders Company, 1953.
- [3] Astier C, Moneret-Vautrin DA, Puillandre E, Bihain BE. First case report of anaphylaxis to quinoa, a novel food in France. *Allergy*. 2009;64:819–820.