

Case report

Oral allergy syndrome to jackfruit (*Artocarpus integrifolia*)

Wüthrich B, Borga A, Yman L. Oral allergy syndrome to jackfruit (*Artocarpus integrifolia*).
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A 30-year-old man from the Philippines with pollen allergy noted the appearance of oral allergy syndrome (OAS) after eating raw apple, raw peach, raw celery, and, recently, jackfruit (*Artocarpus integrifolia*), a tropical fruit which belongs to the Moraceae family (mulberry) and to the genus *Artocarpus* (breadfruit tree). Despite the patient's multiple sensitization in skin prick tests and in the Pharmacia CAP System to birch, grass, mugwort pollen, related fruits and vegetables, and jackfruit, in RAST-inhibition studies neither rBet v 1 nor rBet v 2 (profilin), the well-known cross-reacting allergenic components in OAS, could inhibit the specific IgE response to jackfruit. Whether the reaction to jackfruit is specific or whether other pollen-related, cross-reacting allergenic components exist should be investigated further.

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Oral and pharyngeal pruritus after ingestion of fresh fruits (e.g., apple, peach, kiwi, melon, and lychee), nuts (e.g., hazelnut and almond), or fresh vegetables (e.g., celery and carrots), as a manifestation of cross-reactivity between these foods and pollen of birch and mugwort, is a well-established clinical entity (food-induced pollen-associated oral allergy syndrome [OAS]) (1–8). Bet v 1 and Bet v 2 (profilin) are well-known cross-reacting allergenic components (9–19).

Here we report a patient with a hitherto undescribed type of OAS to the tropical fruit, jackfruit. By means of RAST inhibition studies with rBet v 1 and rBet v 2, we could demonstrate specific sensitization to jackfruit.

Case report

A 30-year-old man from the Philippines, living for many years in Switzerland, had suffered since 1989 from seasonal rhinoconjunctivitis and asthma from spring until late summer. He noted the appearance of OAS after contact with raw apple, peach, and raw celery. Recently, he had also experienced itching and burning in the mouth and throat after eating jackfruit.

Material and methods

Skin prick tests (SPT)

SPT were performed as single tests with commercial extracts in glycerol (Alyostal from Stallergènes Laboratoires, France) of routine inhalants in the volar side of the forearm.

Prick-to-prick testing was performed with raw apple, peach, celery, and jackfruit (2, 6). Glycerol diluent was used as negative control and histamine (10 mg/ml) as positive control. A wheal ≥ 3 mm with the presence of a negative response to the glycerol control was considered to be positive and scored as +, a wheal ≥ 5 –10 mm as ++, and a wheal ≥ 10 –15 mm as +++.

Total and specific IgE

Total and allergen-specific IgE was measured by the Pharmacia CAP System FEIA, according to the manufacturer's instructions.

Jackfruit ImmunoCAP was provided by the Pharmacia Research Forum.

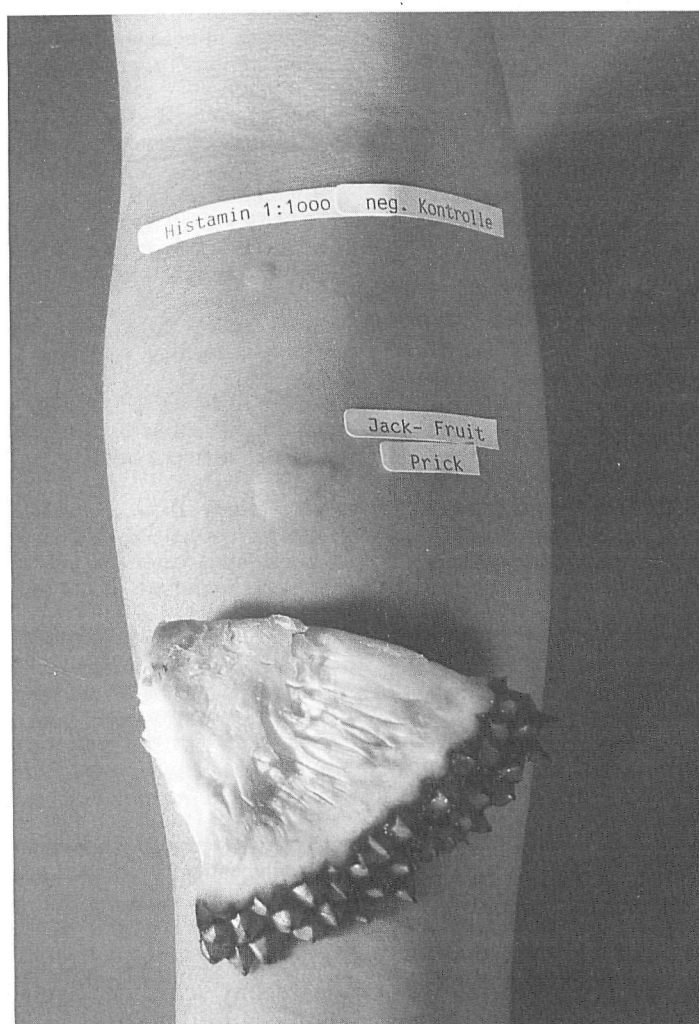


Fig. 1. Positive prick-to-prick test to jackfruit (*Artocarpus integrifolia*).

RAST inhibition

RAST-inhibition experiments with the patient's serum were performed with recombinant (r)Bet v 1 and rBet v 2 and with jackfruit according to Yman et al. (20). rBet v 1 and rBet v 2 were provided by Biomay Produktions- und Handelsgesellschaft mbH, Salzburg, Austria.

Results

The routine SPT were +++ positive for birch and ++ positive for alder, ash, hazel, grass mix, and mugwort pollen, but negative for house-dust mites, storage mites, animal danders, cow's milk, and hen's egg white.

The prick-to-prick testing elicited strong wheal-and-flare reactions (++, wheal > 7 mm) to apple, peach, celery, and jackfruit (+++, wheal > 10 mm) (Fig. 1 shows the prick-to-prick reaction with jackfruit in respect to the histamine control and the jackfruit itself).

Table 1. Specific IgE to inhalants and foods (Pharmacia CAP)

	CAP class	kU/l
Inhalants		
Birch	5	52
Hazel	4	43
Alder	4	35
Beech	4	23
Oak	3	17
Ash	2	1.5
Olive	2	2.4
Grass mix	4	41.5
Mugwort	2	1.6
Foods		
Hazelnut	3	8.2
Apple	2	3
Kiwi	2	1.1
Melon	2	0.9
Carrot	3	5.1
Celery	3	4.5
Parsley	2	1.7
Jackfruit	3	8.2

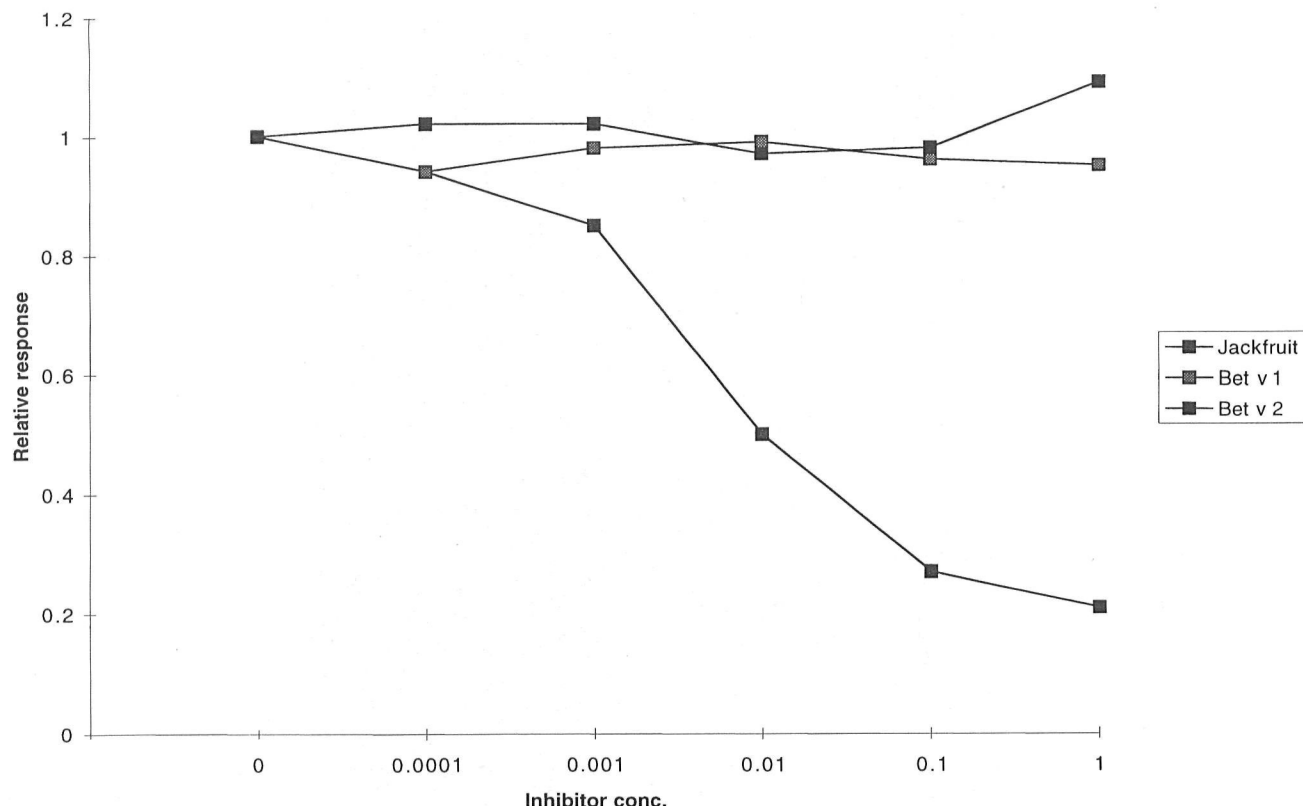


Fig. 2. Inhibition experiments with rBet v 1 and rBet v 2 in jackfruit-positive serum. Neither rBet v 1 nor Bet v 2 (profilin) could inhibit specific IgE response to jackfruit, whereas jackfruit extract dose-dependently inhibited positive jackfruit response.

The total IgE level was 640 kU/l. The RAST CAP (Table 1) showed multiple sensitization to different pollens and various fruits and vegetables as well as to jackfruit (CAP class 3, 6.1 kU/l).

In the RAST-inhibition experiments, neither rBet v 1 nor rBet v 2 could inhibit the specific IgE response to jackfruit (Fig. 2).

Discussion

Patients with allergy to pollens frequently suffer from various clinical symptoms after eating different foods. Well-known examples are the association between birch-pollen allergy and allergic reactions in the mouth and throat (OAS) after ingestion of raw fruits and vegetables. This phenomenon is mainly due to the existence of cross-reactive allergens in birch pollen and related foods (1–8). Bet v 1- and Bet v 2-related allergens have been identified as such cross-reacting structures responsible for this clinical syndrome (9–19). Bet v 2 (profilins) analog proteins are common to many plants and they can, therefore, be considered panallergens. Due to the increasing popularity of exotic fruits in the Western diet, an increasing number of pollen-allergic patients exhibit allergic reactions to these delicacies. Allergy to kiwi (21, 22), mango (23), watermelon (24),

avocado (25), and lychee (12) has been described in recent years. Jackfruit (*Artocarpus integrifolia*) belongs to the Moraceae family (mulberry) and to the genus *Artocarpus* (breadfruit tree). Other members of this family are *Morus nigra* (common mulberry), *Castilla elastica* (caoutchouc tree), and *Brosimum galactodendron* (milk tree).

To our knowledge, this is the first report describing an allergic reaction to jackfruit. Surprisingly, the sensitization to jackfruit in this case is not likely to be explained by cross-reactions between Bet v 1 and Bet v 2 analogs. Whether the reaction to jackfruit is species-specific or whether other cross-reacting allergenic components of protein or carbohydrate nature exist (26), should be investigated further.

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