

Table 1. Skin tests and challenges performed

	Drug	Reaction	SPT (1 : 1)	ID (1 : 100, 1 : 1000)	Oral graded challenge (1 : 100, 1 : 30, 1 : 10, 1 : 3, 1 : 1)*
A patient	Omeprazole	Anaphylaxis	Omeprazole (+) Pantoprazole (-) Lansoprazole (-) Esomeprazole (-) Rabeprazole (-)	Omeprazole (+) Pantoprazole (-)	Pantoprazole (-) Lansoprazole (-) Capsule (-)
B patient	Omeprazole Pantoprazole	Anaphylaxis Anaphylaxis	Omeprazole (+) Pantoprazole (+) Lansoprazole (-) Esomeprazole (-) Rabeprazole (-)	Omeprazole (+) Pantoprazole (+)	Esomeprazole (-)

+, positive result; -, negative result.

*Every 30 min.

Successful desensitization to omeprazole has been referred (3) and it may be an option only for patients with positive SPT to all commercially available PPI forms but not the treatment of choice because alternative safe compounds of the PPI group could easily be identified (1, 5).

Proton pump inhibitors are a rare cause of anaphylaxis, but healthcare professionals need to be aware of this possibility. The cross-reactivity at the whole group should not be assumed and a complete study should be carried out, whenever a drug of this group is indicated.

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'Allergy to red pitaya'

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Key words: food allergy; immunoblotting; *red pitaya*; urticaria–angioedema.

Pitaya (also known as 'fruit of the dragon') is the result of a particular species of cactus, then belonging to the family of Cactaceae (*Hilocereus undatus*) to which belongs the 'fig of India' fruit commonly consumed in southern Italy.

There are two varieties, the red pitaya, of Colombian origin, and the yellow pitaya, of Vietnamese origin. In wild conditions, the plant is of climbing type and has large white flowers that blossom only at night whose duration is for 1 day; for 1 month after flowering, fruit is ready for harvest. Before ripening, pitaya is green and covered with small, sharp thorns. The red pitaya is round and the skin has elongated green languages that wrap the fruit. The flesh inside is soft and can be white or red, with many tiny black edible seeds. It is available in the market throughout the year and kept at room temperature. The pulp is usually consumed raw and used for the preparation of juices (1).

Here, we present a patient, who developed allergy related symptoms after ingestion of fresh red pitaya fruit. The patient, a 19-year-old woman, with no history of allergic disease, reported one episode of urticaria and angioedema after eating fruit salad (pitaya, kiwi, orange, watermelon, and grape) and treatment with i.m. injections of antihistamines and corticosteroids in an emergency unit relieved the symptoms.

Red pitaya fruit proteins were extracted from pulp and peel by stirring for 2 h at 4°C in 0.15 mol/l phosphate buffer saline (pH 7.2). Insoluble particles were removed by centrifugation at

Positive immuno-blotting and skin prick tests in patient with urticaria–angioedema after eating *red pitaya* fruit.

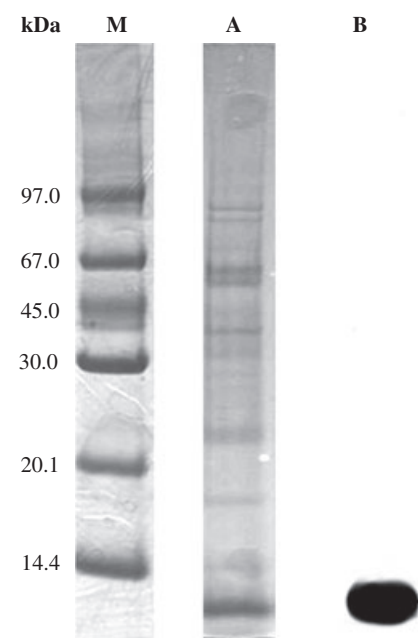


Figure 1. Gel electrophoresis and immunoblotting. Lane M, molecular mass markers; Lane A, SDS-PAGE; Lane B, immunoblotting with sera from subjects sensitive to red Pitaya.

15.000 g for 30 min at 4°C and the supernatant was dialyzed against distilled water. The protein concentration of the extracts (2.4 µg/µl for pulp and 2.7 µg/µl for peel) was determined using Bradford analysis with BSA as the standard (2). The resulting extracts were stored at -20°C until required. The sodium dodecylsulfate-polyacrylamide gel electrophoresis (Nupage Bis Tris; Invitrogen, Milan, Italy) (3) profile of pulp and peel extracts after stained with 0.1% Coomassie brilliant blue showed similar bands ranging from 10 kDa. Pitaya pulp extract proteins (Fig. 1) were electrophoretically transferred to nitrocellulose membrane (Schleicher & Schuell,

Biosciences, Germany) (4). The nitrocellulose membranes were saturated with 0.1 mol/l tris-buffered saline and 0.5% fat-free milk powder and incubated overnight at 4°C with patient serum. Bound specific IgE was detected by peroxidase-conjugated anti-human IgE antibodies from goat (1 : 10 000 in saturation buffer) (Sigma-Aldrich, Milan, Italy), and by using the chemiluminescence method ECL Western blotting Kit (Amersham-Biosciences Ltd, Little Chalfont, UK). Immunoblotting analysis (Quantity One Basic; BioRad, Milan, Italy) showed IgE reactivity in the patient's serum to a single band at 10 kDa (Fig. 1).

Patch test standard series was negative. Prick by prick with fig of India was negative. Prick by prick with peel and pulp of red pitaya fruit and skin prick test with red pitaya fruit pulp extract were positive. Skin prick tests with common inhalant allergens and food commercial extracts (including kiwi, orange, grape, and watermelon) were negative. For prick by prick with pitaya fruit and SPTs with pitaya extracts, saline solution and histamine (10 mg/ml) were used as negative and positive controls, respectively. Specific IgE to foods, including watermelon, kiwi, grape, orange, were negative. Ten healthy volunteers were prick tested with extract red pitaya fruit with negative results.

We reported a case of urticaria and angioedema after ingestion of red pitaya fruit. Studies performed indicated that these reactions may have been IgE mediated. To our knowledge, this is the first description of an IgE-mediated reaction to *pitaya* fruit.

The Authors declare that the manuscript is original and has not been submitted elsewhere. The Authors

declare that they have no financial relationship with any biotechnology manufacturer that has an interest in the subject matter or materials discussed in the submitted manuscript.

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