

## SHORT REPORT

# Allergy to sunflower honey associated with allergy to celery

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Allergy to sunflower pollen is not common. *Helianthus annuus*, the sunflower, belongs to the Compositae family [1]. Anaphylactic reactions to pollens collected by honey bees and used in health foods have been described [2] and in a few cases the offending pollen was of the Compositae family [3].

We report here a case of food allergy to sunflower honey and celery (*Apium graveolens* of the Umbeliferae family.) The RAST inhibitions that were performed suggest the existence of antigens common to sunflower pollen and celery.

A 50-yr-old man developed an anaphylactic reaction a few minutes after ingestion of sunflower honey. He recovered rapidly without any complications following epinephrine and glucocorticoid therapy. The subject reported an angio-oedema of the mouth and throat, a few years before, following ingestion of raw celery. There was no previous history of rhinitis or asthma and no personal or family history of allergy.

The sunflower honey which elicited the anaphylactic reaction was microscopically analysed and found to contain 12% sunflower pollen, 83% chestnut pollen, 4% Rosaceae pollen and 1% other Compositae pollen.

A 50% honey solution prepared in Coca's solution was used for the *in vitro* and *in vivo* tests. Acacia honey, which did not contain any sunflower or Compositae pollens was prepared and used as a control. Intradermal skin tests to common allergens were performed on the volar surface of the forearm by intradermal injection of 0.02 ml of the following allergens (Pasteur Laboratories, Paris, France): house dust (2/100 000 w/v), feathers (2/100 000), *Dermaphagoides pteronyssinus* (1/10 000), cat danders (1/10 000), and dog danders (1/10 000). The reactions were evaluated 15 min later by measuring the diameter of the weal-and-flare. A test was considered positive if the weal-and-flare were equal or greater than 9 and 20 mm, respectively.

Prick tests with grass pollens (1/20), tree pollens (1/20), weeds (*Ambrosia*, *Artemisia*, daisy, dandelion, sunflower;

1/20) (Stallergenes Laboratories, Paris, France) were performed and the results read at 20 min. A test was positive if the weal was greater than 75% of the skin reaction elicited by a positive control (codeine phosphate).

Skin-prick tests to food allergens were undertaken with allergens included in standard food battery screening, and additional special allergens to investigate this clinical case which included raw celery, celery salt, sunflower honey, acacia honey and sunflower seed.

Total serum IgE was determined by the PRIST (Pharmacia Laboratories, Uppsala, Sweden). The result was expressed in international units per millilitre (IU/ml).

Specific IgE to sunflower pollen, sunflower honey and sunflower seed was measured by the classic RAST. All RAST discs mentioned above were prepared by coupling 5 µl of a 1/10 (w/v) extract per one cyanogen bromide activated disc (prepared by Pharmacia Laboratories, Uppsala, Sweden). Negative controls were measured in cord blood. The results were expressed in PRU/ml. Cross-allergenicity studies between sunflower honey, sunflower pollens and celery extracts were determined by the RAST-inhibition procedure according to Gleich *et al.* [4]. Briefly, a volume of 100 µl of sunflower pollen or celery extract was incubated with 100 µl of the subject's serum for 1 hr at room temperature. A sunflower honey allergen disc was then added to each solution and incubated for 3 hr at room temperature. Binding of specific IgE to the sunflower honey disc was shown with radiolabelled anti-IgE (Pharmacia AB, Uppsala, Sweden). Saline was used as control for 0% inhibition. The results were expressed as percentage inhibition.

Skin test results were only positive for Compositae pollen from *Ambrosia* (6 mm), *Artemisia* (10 mm), daisy (9 mm), dandelion (10 mm) and sunflower (10 mm) and were totally negative for other pollens, house-dust, mite and animal danders, but were positive for raw celery (8 mm) and sunflower honey (11 mm).

Total serum IgE level was within the normal range: 57 IU/ml. Specific IgE to sunflower pollen was 0.7 PRU/ml and specific IgE to sunflower honey was 2.2 PRU/ml. No specific IgE to sunflower seed or acacia honey could be detected.

RAST-inhibition to sunflower honey showed a 67% inhibition with sunflower pollen and a 92% inhibition using celery extracts.

In the present case report, we have demonstrated sunflower honey specific IgE (skin test, RAST) in a subject with a history of anaphylaxis following the ingestion of sunflower honey. Honey contains a large number of pollens from entomophilous plants (although in some instances anemophilous plants are also major suppliers of pollens for bees). The type of pollen in honey depends on the location and the season when the pollen is collected [5]. Cross-reactivities among Compositae pollens have been extensively studied and it was found that pollens from many species shared cross-reacting allergens [6]. Honey pollens retain their allergenic properties during the honey-making process. In a case of intolerance to honey, a female beekeeper with an inhalant allergy to Compositae developed an adverse reaction while eating honey that contained large numbers of Compositae pollens but was not intolerant to honey that did not contain Compositae pollen [3]. With the increasing popularity of pollen as a health food, the reports of systemic reactions to pollen ingestion have become more frequent [2,5,7]. Anaphylaxis to sunflower seed has been described. Specific IgE-mediated hypersensitivity has been demonstrated [8]. Sunflower pollen can be responsible for occupational asthma and/or rhinitis [9]. Sunflower oil is not allergenic [10].

Our subject with anaphylaxis to Sunflower honey had a history of sensitivity to raw celery, a positive skin test to celery but not clinical sensitivity to ragweed, which is botanically related to the sunflower. RAST inhibition suggests the existence of common antigens between celery and sunflower pollen. These common antigens have not yet been identified. The well-known association between allergy to celery and pollen sensitivity involves *Artemisia* and birch pollens [11–13].

Food intolerance may involve many possible mechanisms and is often diagnosed without objective measurements. In this case report, we have shown an excellent correlation between clinical symptoms and three immunologic parameters (skin tests, RAST titres and inhibition

RAST) as far as sunflower honey anaphylaxis is concerned.

This case report, documenting severe allergic reactions to sunflower honey, may gain importance in the near future, as more natural foods are employed in our diet.

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