

Allergy to turnip seeds in a bird fancier

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Bird fanciers are daily exposed to several sources of allergens: (1–5) avian (feathers, droppings, serum proteins, etc.), birdseeds, or feather's mites. Turnip seeds (*Brassica rapa* L. var. *rapa*) belong to the Brassicaceae family and are commonly used to feed birds.

We are reporting on a case of a 38-year-old woman, ex-smoker, with a personal history of house dust mite allergic rhinitis and asthma, and a family history of atopy. She has kept birds (canary, goldfinch, budgerigar, lovebirds) at home. She began to complain rhinitis and asthma symptoms when she feeds the birds with birdseeds which contained turnip seeds. She did not have any food allergies. The patient avoided exposure to birds and bird seeds 1 month before performing bronchial challenge tests.

The physical examination, basal spirometry and chest X-ray were normal. The methacholine inhalation test revealed bronchial hyperresponsiveness (PC₂₀ 0.156 mg/ml). Basal induced sputum showed no eosinophilia. Total serum IgE was 359 kU/ml. Skin prick tests with a commercially available battery of common aeroallergens (ALK-Abello SA, Madrid, Spain) were positive to *Derma-thophagoides pteronyssinus* (5 mm) and *D. farinae* (6 mm) and negative to

pollens, moulds and cat and dog epithelia.

A skin prick test with an extract of turnip seeds (10% w/v) were positive (23 mm). Skin prick tests with bird and egg antigens were positive for: canary bird (feathers 6 mm, droppings 7 mm), egg yolk 5% w/v (9 mm), chicken serum 50% w/v (15 mm) and chicken meat 5% w/v (8 mm) and negative to egg white 5% w/v, ovoalbumin 10 mg/ml, ovomucoid 10 mg/ml and conalbumin 10 mg/ml.

Specific inhalation challenge (SIC) with an aqueous extract of turnip seeds (0.69 mg/ml) elicited an isolated early asthmatic response with a fall in forced expiratory volume for the first second of 23% 20 min after SIC. There was an increase in both eosinophil count in the induced sputum (8%) and bronchial hyper-reactivity (PC₂₀ methacholine 0.00625 mg/ml) 24 h after SIC. Specific inhalation challenge was negative in one nonatopic control subject.

To identify IgE-reactive protein components, turnip seed extract was separated by sodium dodecyl sulphate-polyacrylamide gel electrophoresis gels under nonreducing conditions and immunostained with the patient's serum (Fig. 1A). In addition, protein extracts from yellow mustard seed and rapeseed, two *Brassicaceae* species reported as allergenic sources, were immunostained at the same conditions (6). IgE-binding bands with molecular masses ranging between 50 and 51 kDa were detected in the three extracts. Reactive protein bands in turnip extract at 36 kDa and in yellow mustard at around 33 and 90 kDa could also be distinguished. Purified 2S albumin (Sin a 1) and 11S globulin (Sin a 2) from yellow mustard seeds were also tested by immunoblotting. The patient only showed specific IgE to Sin a 2 (Fig 1B).

The patient was diagnosed with allergic rhinitis and asthma in which turnip seeds and avian antigens were

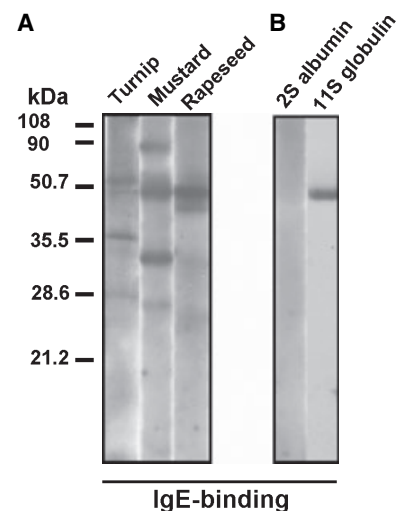


Figure 1. Immunoblotting (nonreducing conditions). IgE response of the patient's serum (diluted 1/5) to turnip seeds, yellow mustard seeds and rapeseeds protein extracts, purified Sin a 1 (2S albumin) and Sin a 2 (11S globulin). 40 and 0.5 µg of protein were used for whole extracts and purified proteins respectively.

involved as aetiological agents. Although the patient was sensitized to egg yolk proteins and avian antigens, the bird-egg syndrome (5) was rejected because the patient ate eggs and chicken meat without experiencing any adverse reaction.

To the best of our knowledge, two important findings deserve to be highlighted in this case report. On one hand, it is the first time that turnip seeds are proven to be able to elicit allergic asthma and, on the other hand, it is the first time that 11S globulins have been involved as an aetiological agent in asthma. 11S globulins (legumins) are ubiquitous proteins in seeds, very well known as food allergens, and several of them have been reported to be major allergens in food allergy. Thus, this is the first time that legumins (food allergens) are involved as inhalant allergens that are able to elicit asthma.

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