

Anaphylaxis following the first ingestion of lychee fruit: clinical features and immunological cross-reactivity implications

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Key words: Compositae; cross-reactivity; lychee; mugwort; sunflower seed.

Litchi chinensis is a tropical fruit belonging to the Sapindaceae family, in which a 16 kDa allergen (Lit c 1) has just been identified (1), corresponding to a profilin.

There are currently very few studies which describe adverse reactions after ingestion of lychee (1–6) and the majority of these describe a concurrent sensitization to plants from the

Compositae family. However, the possible existence of cross-reactivity between both allergenic sources has not been studied.

We describe two cases of anaphylaxis to lychee. Cross-reactivity with Compositae family is demonstrating and the possible involved allergen is discussed.

We describe two patients (case a, case b) with anaphylaxis after the first ingestion of lychee fruit. They were previously diagnosed of respiratory allergy to Compositae pollen (*Artemisia vulgaris* among others) and food allergy to sunflower seed.

A lychee extract (10% w/v) was prepared from raw lychees for *in vivo* and *in vitro* analyses.

Prick-prick test with lychee and skin-prick test with other commercial foods and aeroallergens showed positive results for lychee, *Artemisia* pollen,

sunflower seed, pistachio nut and different pollens in both cases. Serum immunoglobulin (Ig) E detection (CAP-System, Pharmacia, Uppsala, Sweden) was positive, among others, for *Artemisia* pollen (33.6 kU/l) and sunflower seed (0.88 kU/l) in one case (a), and for lychee (0.45 kU/l) and *Artemisia* pollen (2.62 kU/l) in the other case (b). Provided that the diagnostic performance of the CAP for some vegetable allergens is limited, we could not carry out CAP-inhibition assays of lychee in order to quantify cross-reactivity among *Artemisia* pollen, sunflower seed and lychee.

To support the diagnostic procedure, *in vitro* cellular stimulation test: basophil activation test (BAT), antigen-specific sulphidoleukotriene production test (CAST) and histamine release test (HRT) were performed with lychee (0.3 and 0.15 µg/ml), *Artemisia* pollen (1.5 and 0.4 µg/ml) and sunflower seed (1.25 and 0.3 mg/ml) for FAST and sLT, and with the higher concentration of protein for HRT.

Cellular stimulation tests were positive in both cases for lychee, *Artemisia* pollen and sunflower seed in all of the concentrations tested with the exception of sunflower seed at the lowest concentra-

tion for BAT and CAST techniques in one case (a).

In addition, negative results were obtained using these three techniques for the same concentrations of tested allergens in five control patients.

Lychee, *Artemisia* pollen and sunflower seed allergens were characterized by sodium dodecyl sulphate polyacrylamide gel electrophoresis and immunodetection in both cases.

Electrophoresis showed a pattern of protein bands within a range of molecular weight of 24–70 kDa in the three extracts. A protein band of approximately 70 kDa was recognized by serum IgE antibodies of both patients in lychee, *Artemisia* pollen and sunflower seed extracts. The inhibition of the immunodetection by means of the preincubation with *Artemisia* pollen extract (allergen in liquid phase) disabled specific IgE union to this lychee protein but was not enough to inhibit completely itself nor the 70 kDa protein in sunflower seed (Fig. 1).

A new allergen of 70 kDa protein identified in lychee and also present in *Artemisia* pollen and sunflower seed, is a possible candidate of the cross-reactive mechanism among Compositae family

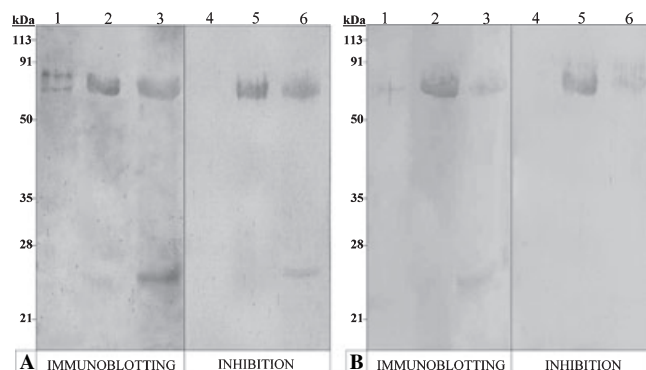


Figure 1. Immunoblotting and immunoblotting inhibition with *Artemisia* pollen in case 1 (A) and case 2 (B). Lanes 1 and 4, lychee extract; lanes 2 and 5, *Artemisia* pollen extract; lanes 3 and 6, sunflower seed extract.

and lychee fruit. This protein has not been reported as an allergen up till now.

To our knowledge, there have only been six studies in which cases of allergy to lychee were reported. In one of these (1) a 16 kDa profilin (Lit c 1) was identified, which cross-react with that of Compositae plants, including sunflower seed. Niggemann et al. (2) described a case of cross-reactivity between lychee and latex by CAP inhibition but without identifying the responsible allergen.

In the other four cases published (3–6) only a description of the reactions which occurred after lychee ingestion was given but no mention was made of the allergenic proteins responsible for these.

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