

Cross-reactivity between coconut and lentil related to a 7S globulin and an 11S globulin

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We report the case of a 2-year-old child who presented two episodes of pruritus, erythema, and generalized urticarial skin reaction after eating some prawns. These episodes appeared 5 min after the ingestion, and total recovery was obtained with emergency anti-histamines. Prior to this, the patient had been diagnosed of lentil allergy, tolerating the rest of food introduced. No other allergic background was reported. The patient was evaluated 1 month after the last reaction. Skin prick tests were performed with a commercial battery containing the most common foods eliciting allergic reactions in our country, including milk and egg proteins, fruits, seafood, nuts, and legumes (Leti CBF, Madrid, Spain). Positive results were obtained for histamine-positive control and for lentil extract (5 × 4 mm wheal) and negative results were obtained for all other extracts. Negative result was also obtained from a skin

prick-by-prick test with prawns, brought to our Service by the mother of the child. The oral challenge test performed with these prawns was negative. After a new exhaustive anamnesis, the mother of the child told us that prawns had been prepared with a coconut sauce. Skin prick-by-prick tests were performed with commercial coconut milk and natural fresh coconut, both yielding largely positive results: 20 × 18 mm wheal and erythema for coconut milk sample and 14 × 12 mm wheal for natural fresh coconut.

Home-made natural coconut and lentil extracts (10% w/v) at a concentration of 1 mg/ml were performed for 'in vitro' tests (1, 2). Sodium dodecyl-sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) with an acrylamide concentration of 14% was performed

with these extracts under reducing conditions (3). Different protein bands ranging from 16 to 56 kDa were observed in the coconut extract whereas protein bands from 20 to 116 kDa were observed in the lentil extract (Fig. 1, Section A). Immunoblots were also performed with the extracts and with the patient's serum (1/10 dilution). Specific IgE-binding bands with an apparent molecular weight from 16 to 34 kDa for coconut extract were obtained (Fig. 1, Section B). Cross-reactivity between lentil and coconut was investigated. An immunoblotting inhibition assay showed a total inhibition of the IgE binding bands when coconut extract and patient serum preincubated with coconut extract (data not shown) and lentil extract (Fig. 1, Section C), at 100 µg/ml concentration, were used.

Cross-reactivity between coconut and lentil related to seed storage proteins (7s and 11s globulins).

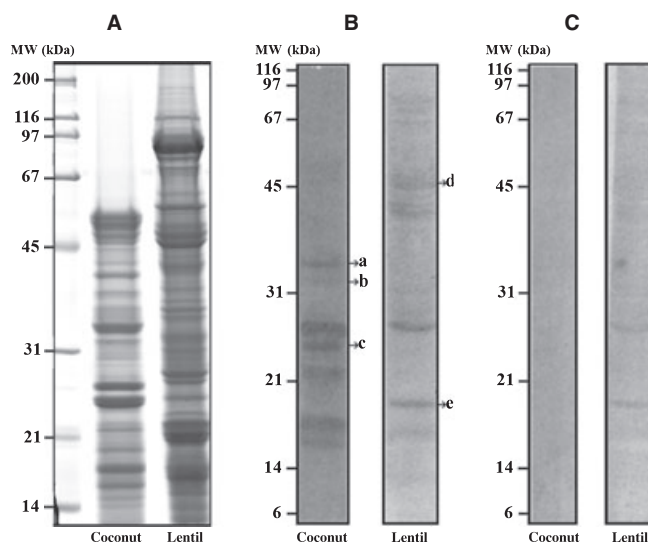


Figure 1 Section A: SDS-PAGE with coconut and lentil extracts (50 µg). Section B: IgE immunoblot with coconut and lentil extracts. Section C: IgE immunoblot inhibition assay of coconut extract pre-incubated with lentil extract (total inhibition of the IgE binding bands) and lentil extract pre-incubated with coconut extract (partial inhibition). a, c and e indicate IgE binding bands identified as 11S globulins. b and d indicate IgE binding bands identified as 7S globulins.

Partial inhibition was obtained when inhibition assays were performed with lentil extract and serum preincubated with coconut (Fig. 1, Section C).

Specific IgE-binding bands were extracted from the gel, digested with trypsin, and the proteins were identified by mass spectrometry (MS), as previously described (3). The aminoacid sequences obtained were identified using MASCOT PROGRAM[®] software (<http://www.matrixscience.com>). Some IgE-binding bands contained in coconut extract were identified as two seed-storage proteins, a 7S globulin ('b' in Fig. 1) and an 11S globulin ('a' and 'c' in Fig. 1), expressed as 2 subunits under reducing conditions. Both proteins were involved in cross-reactivity between coconut and lentil (1, 4).

In summary, we report a case of a child with lentil and coconut allergy in which IgE mechanism has been demonstrated. Our patient tolerated all other legumes and, in contrast to other reports (4, 5), has not presented clinical cross-reactivity with nuts. This is the first time that cross-reactivity between coconut and lentil has been described. Results of the immunological studies provided evidence that both allergens,

7S and 11S globulin, were involved in this cross-reactivity. In addition, this case report support the claim that coconut allergy is as a new cause of hidden food allergy that should be kept in mind when evaluating patients with idiopathic anaphylaxis. Further studies including more coconut allergic patients are necessary to elucidate the possible cross-reactivity between coconut and other legumes.

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