

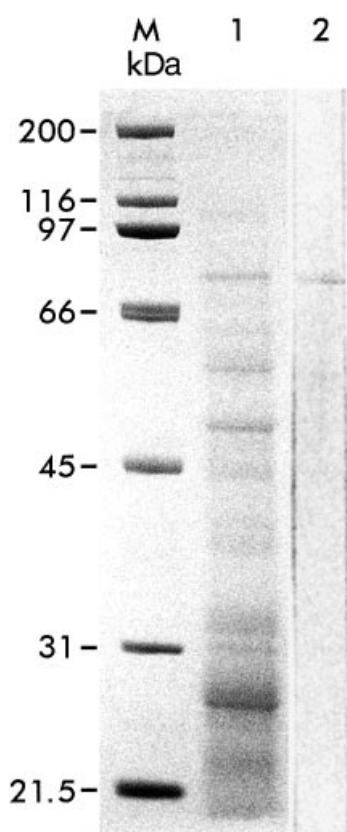


Figure 1. SDS-PAGE result of *Gammarus* extract (lane 1) and IgE immunoblot analysis with subject's serum (lane 2), showing IgE binding to protein band at about 80 kDa. Lane M indicates protein markers.

Skin prick testing with a standard series of 26 common inhalant allergens including herring, flounder, sole, cod, haddock, shrimp, and crab (ALK, Copenhagen, Denmark) revealed only sensitization to tree pollen. However, the patient showed a strong positive skin reaction to the extract of dried *Gammarus*, the product of the fish-food factory (wheal diameter ≥ 10 mm).

Positive IgE antibodies to the protein extract of *Gammarus* could be detected in the patient's serum (1.4 kU/l, RAST class 2) by the enzyme-linked allergosorbent test (EAST) with an Allergopharma RAST test kit (Allergopharma Joachim Ganzer KG, Reinbek, Germany). To prepare the solid-phase antigen, the dried *Gammarus* was extracted in 0.1 mol/l potassium phosphate buffer, pH 7.4. The proteins were then coupled onto paper disks at a protein

concentration of 1 mg/ml. IgE binding to *Gammarus* extract in two control sera from unrelated subjects was not observed.

Immunoblot of *Gammarus* extract was also performed by the method described previously (1). Protein staining after SDS-PAGE showed different bands in the range of 14 to >90 kDa. Immunostaining revealed a distinct IgE-binding band around the 80-kDa area (Fig. 1). No IgE-binding was observed with control sera.

Specific IgE to Chi t 1-9 (hemoglobin allergens of the nonbiting midge *Chironomus thummi thummi*, another pet-fish food) was also detectable (1.0 kU/l).

The clinical examination revealed FEV₁ of 76.4%, MEF₇₅ of 55%, MEF₅₀ of 46%, and MEF₂₅ of 32% of the predicted values of Quanjer et al. (2). The patient also displayed an unspecific bronchial hyperreactivity in the methacholine challenge test (PD₂₀=0.1 mg methacholine). An immediate asthmatic reaction occurred 30 min after an occupational-type inhalative challenge test in handling dried *Gammarus* shrimp (increase in sR_t to more than 250% of the baseline value).

From the above test results, we concluded that the occupational exposure to the dust of dried *Gammarus*, as well as the type I sensitization to *Gammarus* shrimp, was the major cause of the asthma episode in our patient.

Allergic disorders such as asthma, allergic rhinitis, and bronchitis induced by occupational contact with pet-fish food among workers in the fish-food industry have been reported. The most frequently studied allergens in fish food are the hemoglobin molecules Chi t 1-9 of *C. thummi thummi* (3, 4). Several cases of sensitization to *Daphnia* spp. in aquarium keepers have also been described (5). There has been no report on type I sensitization to *Gammarus* shrimp due to occupational exposure.

According to the patient, about one-third of the staff of the same factory complained of respiratory symptoms upon exposure to

dried *Gammarus* shrimp. Therefore, this case does not seem to be a single one. A similar sensitizing effect on fish fanciers using this product on a regular basis also cannot be excluded.

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Immediate-type allergy caused by poppy seed

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Key words: atopy; nut allergy; poppy seed allergy.

• The wide spectrum of clinical symptoms caused by food allergens includes potentially life-threatening immediate-type reactions. The association between sensitivity to diverse vegetables and sensitivity to different pollens is well

known. Nevertheless, it is often difficult to find the causative allergen. Life-threatening allergic reactions are often caused by nuts. Moreover, nuts are often suspected due to their widespread availability and hidden occurrence in food

IgE-mediated allergy in an otherwise nonatopic patient.

preparations. Therefore, routine diagnosis considers those highly allergenic foods (e.g., hazelnuts, walnuts, and almonds) as well as pollen allergens.

We report on a 52-year-old patient who developed epigastric pain, angioedema, and respiratory distress a few minutes after eating a piece of poppy cake. It was the first such attack in his life and he required emergency care. He neither reported any similar previous adverse reaction to foods, nor did he suffer from any other serious disease. With regard to atopic symptoms, the presented patient did not complain of allergic rhinitis, asthma, or atopic eczema. The family history was also negative for atopy.

The diagnosis of poppy-seed allergy was confirmed by skin tests (prick) and specific IgE antibodies (RAST; specific IgE was 1.69 IU/ml, class 2). In the skin tests, an immediate type-I sensitivity to nuts (hazelnuts, walnuts, and almonds) without clinical relevance was detected as well. The patient did not report clinical symptoms of allergic rhinoconjunctivitis or oropharyngeal symptoms after consumption of special food products such as nuts and fruits. The prick tests were positive with raw and baked poppy seed, suggesting the thermostability of the relevant antigen.

Pollen-associated allergies to food preparations are more common in Europe than food allergies without any association with atopic symptoms, especially allergic rhinitis (1). Reports of allergic type-I sensitivity to poppy seed are rare. A member of the Papaveraceae family, the poppy flower grows as a weed in cereal fields and along country roads. Clinical symptoms in allergic patients may affect the skin, mucosa, and

bronchial and gastrointestinal tract, as with other food allergens. According to the literature, severe reactions often occur, affecting mainly atopic patients (2–6).

Anaphylactic reactions after consumption of poppy cake were first reported by Wagner & Ring (2). The clinical symptoms ranged from itching around the mouth and lips, nausea, and dyspnea to anaphylactic reactions. The diagnosis was confirmed by prick test and RAST. As in our patient, positive skin reactions to several nut allergens were found, probably representing cross-reactivity between nuts and poppy seed. In 1997, Gamboa et al. (7) reported on an atopic patient who presented with a history of contact urticaria and angioedema after contact with poppy flowers.

Sensitization to poppy seed probably does not need special exposure. Reports of sensitizations already in childhood suggest that a genetic determination is important.

It is still unclear why in the reported cases poppy-seed allergy coincides with nut allergy. It is conceivable that in some cases sensitization to poppy allergens may occur by the more common nut allergens. On the other hand, at least in Germany, the use of poppy seed for cakes is common.

By this case report, we underline the necessity of an exact food anamnesis and emphasize the possibility of poppy-seed allergy, especially if one can find positive skin tests to nuts with lack of clinical relevance.

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Chlorendic anhydride allergy

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Key words: allergy; asthma; contact urticaria; IgE antibodies; organic anhydrides; phthalic anhydride.

● In June 1997, a 47-year-old mechanic began to repair old painted forest harvesters by metal-inert-gas (MIG) welding. Next autumn, he experienced immediate erythema and edema of the face and later also dyspnea when welding. Peak expiratory flow (PEF) follow-up (twice a day) showed 22% PEF variation during one work day. Slight bronchial hyperreactivity was found. The symptoms diminished during other work but returned when the subject was exposed in welding again.

Our examinations showed normal clinical status. Bronchial hyperreactivity had disappeared. Skin prick tests with common

A new anhydride to add to the list of allergens in paints.
