Anaphylaxis due to Ingestion of *Silene vulgaris*

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Silene vulgaris, commonly known as maiden's tears, is a herbaceous plant belonging to the Caryophyllaceae family [1]. It grows in poorly tilled land in Mediterranean countries (Europe and northern Africa), west-central Asia, and North America. A commonly consumed plant gathered in the wild or farmed, *S vulgaris* has a range of medicinal and cosmetic uses and is also grown as an ornamental. The tender leaves of this plant may be eaten raw in salads, while mature leaves are usually fried or boiled to be used as ingredients in stews or omelettes. It is considered a delicacy owing to the small size of its leaves, thus requiring many plants for a single human serving.

A 69-year-old man developed generalized urticaria, cough, dyspnea, nausea, vomiting, and facial angioedema within 10 minutes of eating cooked *S vulgaris*, strawberries, and bee pollen. He visited the emergency department where he was treated with dexchlorpheniramine and corticosteroids, and his symptoms resolved within 7 hours of admission. No other drugs or cofactors were associated with the episode. He had consumed bee pollen daily and, until this episode, ate strawberries and *S vulgaris* without symptoms. Since the reaction, he has avoided bee pollen and *S vulgaris* but has tolerated the following: strawberries, legumes, and other vegetables such as lettuce, spinach, Swiss chard, asparagus, broccoli, and avocado; fruits including peach, banana, and apple; peanuts and other nuts; and other edible wild plants such as coriander, parsley, oregano, and thyme. Prior to this reaction, the patient had a 35-year history of mild pollen-induced seasonal rhinoconjunctivitis.

Skin prick testing (SPT) performed with a battery of common aeroallergens (pollens, dust mites, molds, and animal dander) (Roxall, LETI Pharma) showed a positive response (wheal ≥3 mm) to various pollens (*Cupressus arizonica, Olea europaea, Artemisia vulgaris, Lolium perenne, Dactylis glomerata, Salsola kali*).

SPTs to legume extracts (Roxall) were positive for green bean (5×4 mm) and mustard (4×6 mm) and negative for pea, chickpea, white bean, lentil, and soybean.

SPTs with tree nut extracts (Roxall) were positive for chestnut (5×4 mm) and sunflower seeds (4×4 mm) and negative for almond, peanut, hazelnut, walnut, pine nut, pistachio, and cashew.

SPTs with purified allergens were negative for Pho d 2 (profilin from *Phoenix dactylifera* pollen) and the peach nonspecific lipid transfer protein, Pru p 3 (Roxall).

The results of SPT with extracts of raw *S vulgaris* (10×15 mm) and cooked *S vulgaris* (9×11 mm) at a concentration of 10 mg/mL were positive.

Prick-prick testing with cooked and raw *S vulgaris* was positive, with wheal diameters of 15×15 mm and 12×10 mm, respectively. The result of a prick-prick test with bee pollen extract was negative.

Readings taken at 15 minutes were evaluated by comparing the wheal induced by the offending food and by 10 mg/mL of histamine [2].

Twenty nonatopic, pollen-allergic patients were tested as negative controls.

Written informed consent was obtained from the patient for all in vitro and in vivo studies.

Serum specific IgE for aeroallergens and food extracts was determined by immunoassay (Siemens Immulite 2000/Xpi); values over 0.35 kU_A/L were considered positive. The results were as follows: *Cupressus arizonica* pollen, 1.74 kU_A/L; *Olea europaea* pollen, 0.48 kU_A/L; *Artemisia absinthium* pollen, 1.53 kU_A/L; *Salsola kali* pollen, 0.79 kU_A/L; *Lolium perenne* pollen, 0.59 kU_A/L; birch pollen, 1.47 kU_A/L; chestnut, 0.44 kU_A/L; sunflower seed, 0.74 kU_A/L; red bean, 1.01 kU_A/L; green bean, 1.02 kU_A/L; and mustard, 0.46 kU_A/L. Specific IgE was negative for pollen from *Platanus acerifolia, Chenopodium album, Parietaria judaica*, and *Plantago lanceolata*, as well as other nuts (almond, peanut, hazelnut, walnut, cashew, pine nut, and pistachio) and legumes (pea, chickpea, white bean, lentil, and soybean). Total IgE was 986 IU/mL, and tryptase was normal (5.2 µg/L).

Controlled oral administration of bee-pollen grains yielded a negative result.

Protein extracts from raw and cooked *S vulgaris* were prepared by delipidation, homogenization in phosphate-buffered saline (15% wt/vol) (50 mM phosphate buffer; 100 mM NaCl; pH 7.5), dialyzation against distilled water, and lyophilization [3].

Both extracts were analyzed by SDS-PAGE as described by Laemmli [4]. SDS-PAGE IgE-immunoblotting assay was carried out using polyvinylidene difluoride (PVDF) membranes (Immun-blott PVDF Membrane, Bio-Rad), patient serum (dilution 1/5), and both *S vulgaris* extracts. IgE reactivity showed broad IgE-binding bands of approximately 90-35, 21-18, 16.5, and 14-12 kDa in raw *S vulgaris* extract and 90, 50, 37, and 22 kDa in cooked *S vulgaris* extract (Figure).

Edible wild plants are commonly consumed in certain regions, and consumption of wild plants is increasing in urban and rural settings [5]. Cases of other types of IgE-mediated allergy to wild edible plants [3,6-9] have been reported, although the causative allergens are not clearly identified.

We present a case of IgE-mediated allergy to *S vulgaris* demonstrated through in vivo and in vitro studies, suggesting that the allergens involved are proteins ranging from 22 kDa to 90 kDa. To our knowledge, no other cases of allergy to *S vulgaris* have been published. The implication of profilins and nonspecific lipid transfer protein was ruled out by the SPT results and the molecular mass of the IgE bands detected in the cooked extract. Studies are under way to identify more cases and to characterize the allergen bands in greater detail.

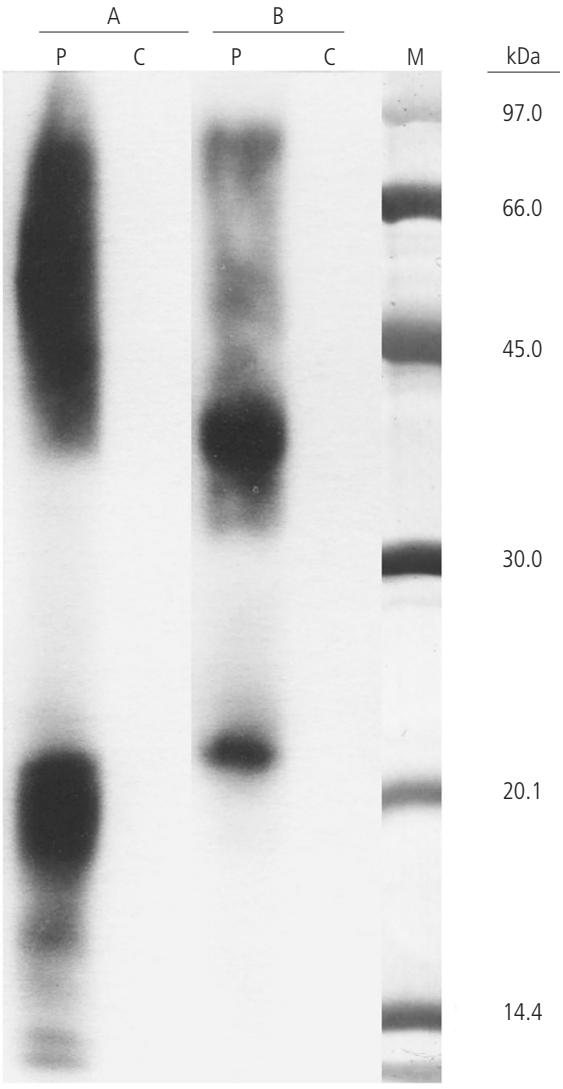

Figure. SDS-PAGE immunoblotting. A, Raw *Silene vulgaris* extract. B, Cooked *Silene vulgaris* extract. Lane P, patient serum; Lane C, control serum (pool of sera from nonatopic participants); Lane M, molecular mass standard.

Allergists and patients must be aware that wild edible plants may be potent allergens and capable of inducing severe reactions.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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