



## Soy Sauce and Allergic Skin Reaction

Keiji Sugiura\*

Department of Environmental Dermatology and Allergology, Daiichi Clinic, Japan

\*Corresponding author: Keiji Sugiura, Department of Environmental Dermatology and Allergology, Daiichi Clinic, Japan, E-mail: [ksugiura@daiichiclinic.jp](mailto:ksugiura@daiichiclinic.jp)

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Allergy, Soy sauce, Skin test

### Editorial

In this editorial, I describe the difficulties of diagnosing soy sauce allergies, since soy sauce produces histamine during brewing and storing. Some Japanese people develop irritation, itching and cellulitis after consuming foods with soy sauce. These symptoms could be caused by soy sauce allergy, histamine poisoning and/or other factors.

Between the 13<sup>th</sup> and 16<sup>th</sup> centuries, Japanese people started cooking with a solution they obtained from preserved soybean paste [1] - this was the origin of soy sauce. The soy sauce trade began in the early 18<sup>th</sup> century [1], which was later followed by mass production and export around the turn of the 19<sup>th</sup> century [1]. Soy sauce is now globally recognized as a popular Japanese sauce.

The study included eight female patients with soy sauce allergies. Their age distribution was from 10 to 51 years old, with an average age of 33.25-year-old. Their symptoms included: cellulitis, itching, swelling of the lips, coughing, and dermatitis around the lips.

Fermented soy and flour products are not detected in soy sauce. Patients with soy sauce allergies had not developed soy and flour allergies since determining specific IgE scores to soy, flour and salt did not help for soy sauce allergy. Conventional skin test criteria [2-13] weren't useful to diagnose soy sauce allergy because the results varied depending on each criterion, physicians and institutes that supplied data [14]. New diagnostic criteria include an analysis using a combination of the A/H ratio [15] and my methods [16]. Positive reactions in both evaluations could indicate soy sauce allergy.

My diagnostic criteria were suitable to evaluate soy sauce allergies using skin tests [16] by decreasing the number of false-positive reactions. Soy sauce typically contains histamine since it can cause various symptoms including histamine poisoning, urticaria and flushing [17]. These histamines are made during the brewing process [19,20] because shoyu-flavones inhibit histidine decarboxylase [1,20]. It is interesting to note that our patients did not appear any symptoms after eating histamine-containing foods (e.g. beer, wine and tuna) [18,21] or histamine-releasing foods (e.g. additives, strawberries, tomatoes and peanuts) [18].

Soy is recognized as a major food allergen, however soy sauce is considered a low-allergenic food because the allergens of soy and flour degrade during fermentation [22,23]. Soy sauce allergy is therefore not based on the soy or flour. It is difficult to detect allergens in soy sauce - allergens specific to soy and flour are not detected in soy sauce. Soy sauce often contains sediments that affect its quality, but these are composed of unknown proteins synthesized during production [1]. I speculate that these sediments might be the source of soy sauce allergens. Ideally, if sediments could be sampled, it would be possible to conduct skin tests. The most effective treatment is to avoid using soy sauce in cooking. If patients develop cellulitis and dermatitis, external medications and anti-histamine internal medicines should be used as first-line treatments. In the case of systemic or anaphylactic reactions caused by soy sauce allergens and/or histamine poisoning, steroid, anti-histamine and adrenalin injections are required. Soy sauce is very interesting. The benefits and adverse effects of soy sauce should be further investigated.

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