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Letter to the Editor

A case of anaphylactic reaction to chamomile tea in a patient with mugwort pollinosis

Dear Editor,

Pollen-food allergy syndrome is a condition in which an individual sensitized by a pollen antigen exhibits cross-reactivity with antigens present in ingested foods, resulting in immediate allergy symptoms. Individuals who have become sensitized to mugwort pollen via the respiratory tract may develop allergy symptoms upon ingestion of chamomile, which has an antigen homologous to the pollen antigen. Here we report a case of chamomile allergy in a patient with mugwort pollinosis.

A 65-year-old Japanese woman was referred to our department because of general urticaria, vomiting and dyspnea that had occurred 30 min after drinking chamomile tea. Her medical history included pollinosis, diabetes and hyperlipidemia. Laboratory tests revealed a total serum IgE level of 345 IU/ml. According to the ImmunoCAP® (Thermo Fisher Scientific, Uppsala, Sweden) test, specific IgE was positive for mugwort (117 UA/ml, class 4), birch pollen (20.7 UA/ml, class 3), orchard grass (33.6 UA/ml, class 3) and timothy grass (15.3 UA/ml, class 3), but negative for alder pollen. The serum IgE levels (ImmunoCAP® ISAC; Thermo Fisher Scientific) for mugwort was Art v 1 (8.8 ISU-E, class 2). A skin prick test (SPT) was performed using the prick-prick method and considered positive when the average wheal diameter induced by the allergen was 50% of the positive control response induced by histamine chloride at 10 mg/ml. The patient showed a positive reaction to chamomile tea leaves (Fig. 1a, b). Chamomile tea is often prepared using German chamomile (*Matricaria chamomilla*). However, as this plant was not available in Japan, the SPT was performed using feverfew (*Tanacetum parthenium*), a species closely related to German chamomile. The sample was divided into the tubular petals at the center, where pollen adhered, and the tongue petals (Fig. 2a, b). The tubular petals were positive on both non-heating and heating, while the tongue petals were positive only with non-heating (Fig. 2c, d). The tubular petals produced a stronger positive reaction than the tongue petals (Fig. 2c). Other positive reactions were elicited by mugwort and orchard grass. No reactions were elicited by cedar pollen. Pollen antigens of mugwort, orchard grass and cedar were obtained from Torii Pharmaceutical (Tokyo, Japan). We did not perform tests for other pollens. Edible chrysanthemum with adhering pollen elicited a positive reaction after both non-heating and heating using the prick-prick method.

As the patient had never consumed anything containing chamomile as an ingredient in the past, we concluded that this was not a case of type I allergy due to oral sensitization with chamomile. We

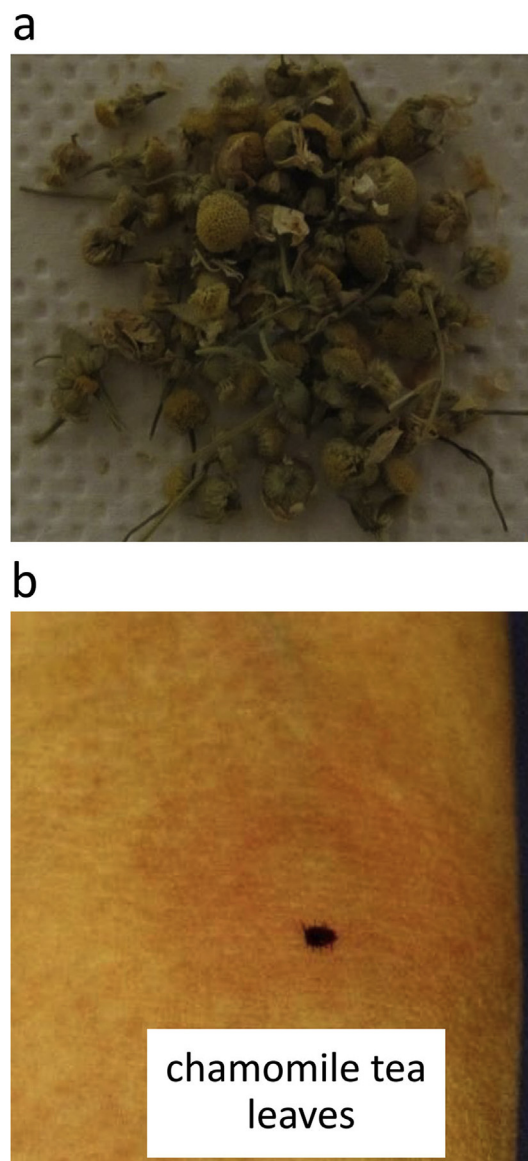


Fig. 1. a: Chamomile tea leaves. **b:** Chamomile tea leaves eliciting a positive SPT response.

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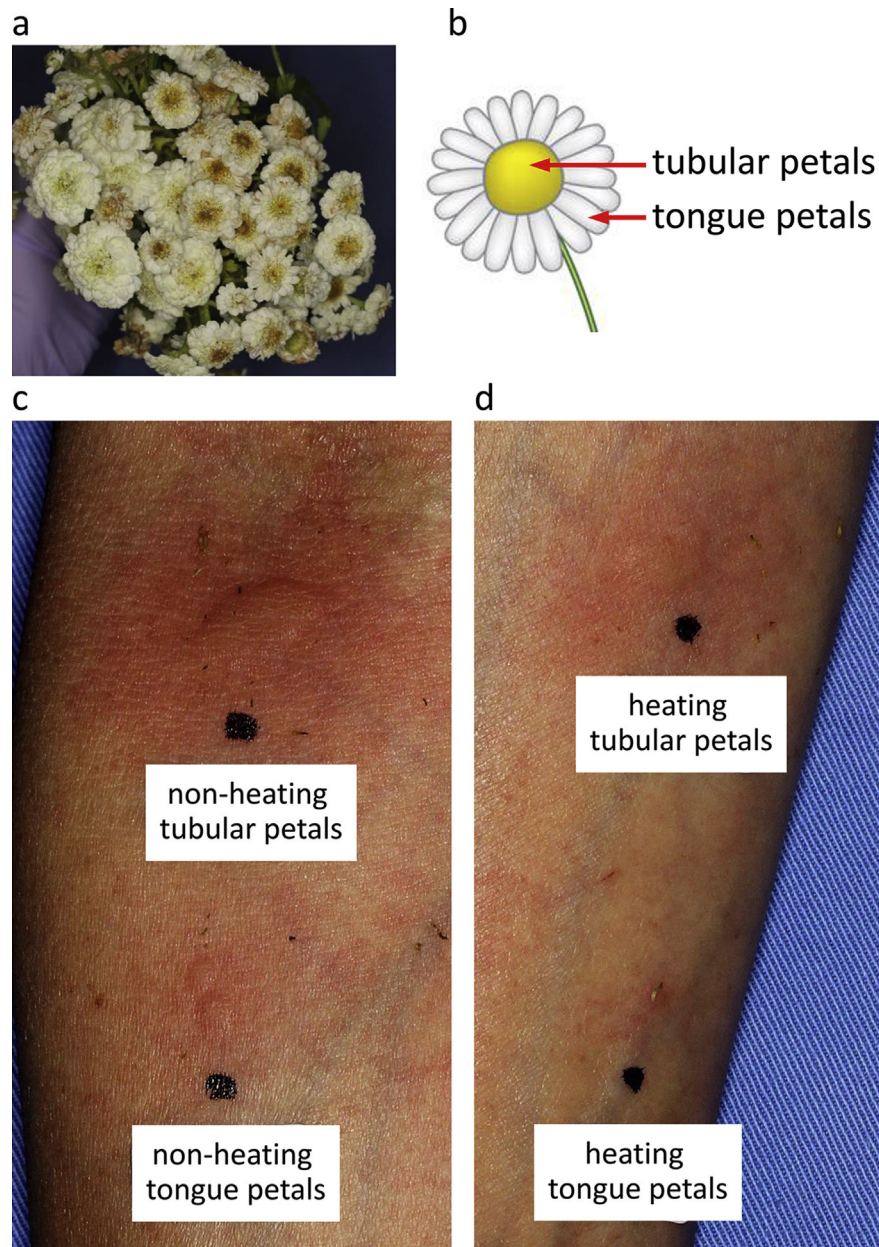


Fig. 2. **a:** Feverfew (*Tanacetum parthenium*). **b:** The sample was divided into the tubular petals at the center, to which pollen adhered, and tongue petals. **c:** Non-heated tubular petals and tongue petals gave positive SPT results. **d:** Heated tubular petals gave a positive response, whereas heated tongue petals gave a negative response.

deduced that the Art v 1 of the mugwort pollen had cross-reacted with the chamomile as a sensitizing antigen.

Including the present case, 15 cases of chamomile allergy have been reported.^{1–4} The patients included 11 women and 4 men, and the age at onset ranged from 14 to 76 years. The modes of chamomile intake varied, including chamomile tea and herb tea with chamomile, but some cases were due to chamomile enema. The symptoms were urticaria, nasal symptoms, angioedema, abdominal symptoms, respiratory distress, and decreased blood pressure. Among the 15 cases, 12 were associated with mugwort pollinosis. Morin has described the cross-reactivity of chamomile and mugwort.⁵ Twenty-four patients with asthma and/or rhinitis sensitized primarily to mugwort underwent SPTs and oral provocation tests with chamomile. The SPT positivity rate was 85.7%, while the rate of oral allergy syndrome (OAS) symptoms was 61.9%.⁵ Four types of pollen-food allergy syndrome caused by

mugwort pollen have been reported: celery-mugwort-spice syndrome, mugwort-mustard syndrome, mugwort-peach association, and mugwort-chamomile association. The allergic component responsible for mugwort-chamomile association is Art v 1.⁶ The molecular mass of Art v 1 is 24–28 kDa.⁷ In the present case, Art v 1 was positive. We did not perform a suppression test to confirm the cross-antigenicity relationship, as it may have caused a cross-reaction with chamomile as a sensitizing antigen for mugwort pollen.

We advised the patient to refrain from ingesting chamomile teas, edible chrysanthemum and Japanese butterbur scape. Edible chrysanthemum and Japanese butterbur scape are Asteraceae, like chamomile. Chamomile tea extract is derived from tongue petals and tubular petals, to which pollen can adhere upon exposure to boiling water. This process results in a large amount of antigen exposure. Similarly, when ingesting edible chrysanthemum,

the whole head flower with pollen is boiled and eaten. Japanese butterbur scape with pollen is often consumed as tempura (deep-fried in oil). *Yomogi-mochi* (mugwort rice cake) and *yomogi-dango* (mugwort dumplings) are made from young leaves in early spring. Mugwort is able to produce pollen from summer to autumn. Since pollen does not adhere to young leaves, *yomogi-mochi* and *yomogi-dango* can be ingested without problem.

In addition, we advised the patient to refrain from using bath salts and cosmetic products containing chamomile.

Chamomile tea tends to be consumed by women rather than by men. Given the fact that chamomile tea is associated with health benefits, the rate of ingestion by the populace at large may increase in the future, which will likely result in more cases of such allergy being reported.

Conflict of interest

The authors have no conflict of interest to declare.

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