

LETTER TO THE EDITOR

Case of anaphylaxis caused by black ginger in a dietary supplement

Dear Editor,

Black ginger (*Kaempferia parviflora*) has been used as a nourishing medicinal tonic in Thailand^{1,2} and has recently become a popular ingredient in dietary supplements in Japan. Herein, we report the first case of anaphylaxis caused by black ginger. Black ginger belongs to the family Zingiberaceae, which includes zedoary (*Curcuma zedoaria*), turmeric (*Curcuma longa*), wild turmeric (*Curcuma aromatica*) and ginger (*Zingiber officinale*).

A 54-year-old woman was referred to our department with anaphylactic symptoms, including systemic urticaria, abdominal pain, nausea and dyspnea, which had started 2 h after intake of five kinds of dietary supplements. A skin prick test

(SPT) yielded a positive result for Company A's dietary supplement 1% aqua (aq.), while tests for other dietary supplements yielded negative results. SPT on the ingredients of Company A's dietary supplement yielded a positive result for black ginger 1% aq., but negative results for the other five ingredients. Therefore, we diagnosed the patient with anaphylaxis caused by black ginger. She ate the causative supplement for the first time. Additionally, positive SPT results were obtained with 1% aq. of *C. zedoaria*, *C. longa*, *Z. officinale* and 10% aq. of *C. aromatica*.

To identify the causative protein, we performed polyacrylamide gel electrophoresis (PAGE) and western blotting in both sodium dodecylsulfate PAGE (Fig. 1a) and 2D-PAGE (Fig. 1b),

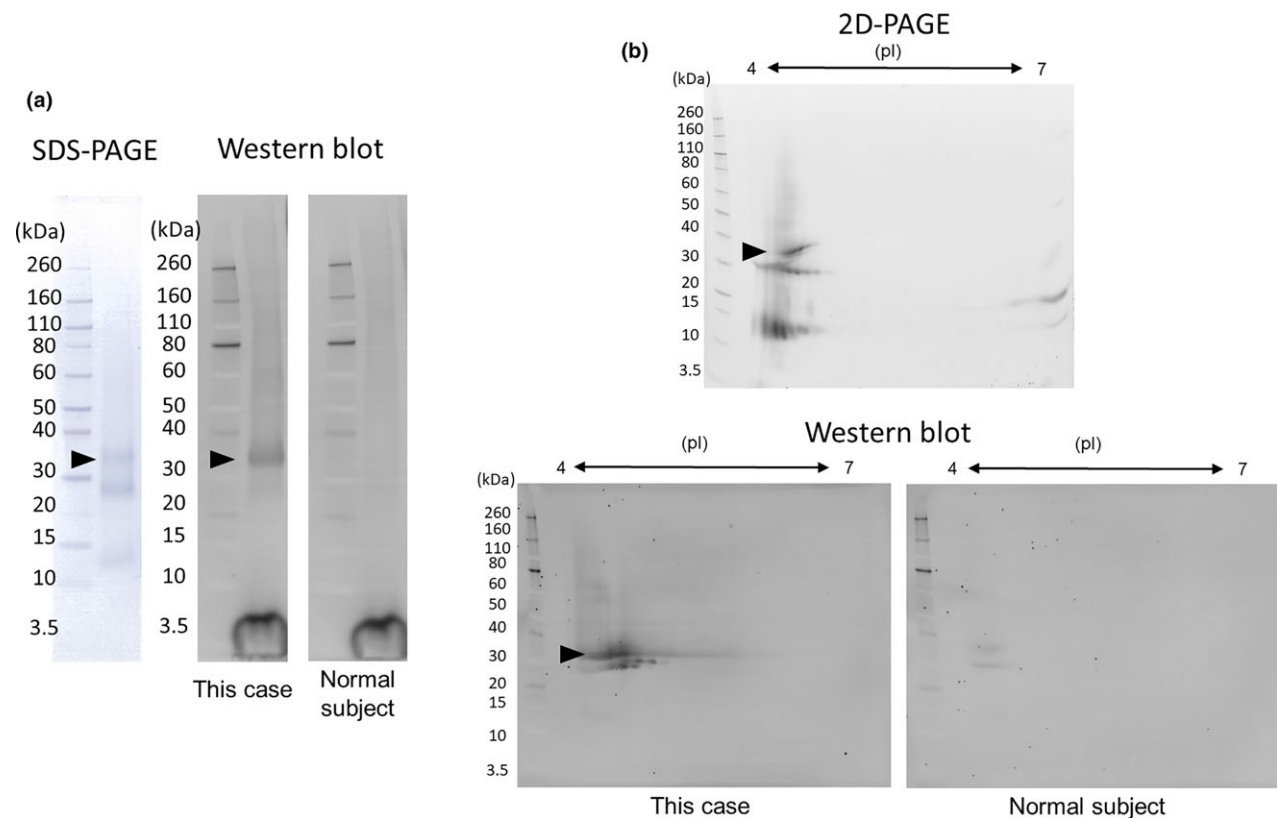


Figure 1. Result of western blotting assay of black ginger in patient's serum with the membranes of both (a) sodium dodecylsulfate (SDS) polyacrylamide gel electrophoresis (PAGE) and (b) 2D-PAGE. (a) SDS-PAGE and (b) 2D-PAGE were performed to separate proteins of black ginger, which were then allowed to react with sera of the patient and a normal subject. Reactions indicating the patient's immunoglobulin E antibody binding to black ginger were observed at 35 kDa in both (a) SDS-PAGE and (b) 2D-PAGE.

and identified the positive band at 35 kDa of black ginger. Mass spectrometric analysis using TripleTOF[®] 6600 (ABSCIEX, Framingham, MA, USA) and PROTEINPILOT[™] software version 5.0 (ABSCIEX)³ against entries in the National Center for Biotechnology Information (NCBI) nr database revealed that the spot represented basic endochitinase C (NCBI reference sequence: XP_003563255.1). In addition to the analysis of *K. parviflora*, we detected the 35-kDa protein in the patient's serum corresponding to extracts of *C. zedoaria*, *C. longa*, *C. aromatica* and *Z. officinale* (data not shown).

When the patient was 31 years old, she began working at a wholesale store, handling incense sticks and powders that contained *C. longa*. Until then, she did not have any atopic disorders. Two years later, she developed rhinorrhea and cough, especially when she inhaled incense powder. However, she did not have dermatitis and/or pruritus on her hands. Therefore, although transcutaneous sensitization was not completely ruled out, we reasoned that the patient had been transnasally or transairway sensitized to the protein of Zingiberaceae, and oral intake of black ginger triggered anaphylaxis by cross-reaction. We gave her a list of food products, medicines and supplements containing Zingiberaceae and its extract to be avoided and advised her to wear gloves and a mask at her workplace.

Immediate allergy due to Zingiberaceae is rare. Anaphylaxis has been caused by *C. aromatica* in dietary supplement⁴ and contact urticaria caused by curcumin in *C. longa* has been reported.⁵ It is believed that black ginger has unique health benefits, such as improvement of metabolic syndrome and physical fitness performance.^{1,2} Anaphylaxis due to black ginger is rare but may occur in individuals who frequently inhale incense powders and the smoke from incense sticks.

CONFLICT OF INTEREST: None declared.

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