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Letter to the Editor

A case of anaphylaxis due to alpha-mannosidase from *Auricularia*

Dear Editor,

Auricularia auricula-judae, known as Jew's ear, wood ear, jelly ear, etc., is a species of edible Auriculariales fungus found worldwide. It is a popular food item in East Asian countries including Japan, Korea, and China. The patient described in the present case experienced a few anaphylactic episodes after ingesting Chinese food containing fried *Auricularia*.

A 37-year-old Japanese woman had a 10-year history of recurrent episodes of stomach ache, diarrhea, vomiting, and urticaria after eating Chinese food at restaurants. In addition, her allergic history showed oral allergy syndrome to cherry and peach. The patient suspected that *Auricularia* was the cause of her anaphylaxis and visited our hospital for an allergy test. Her total IgE was 323.1 IU/ml. A prick-by-prick test was performed with a positive control of 10 mg/ml histamine (Torii Pharmaceutical, Tokyo, Japan) and a negative control of saline.[1] Samples of raw *Auricularia* and its supernatant, which was obtained by soaking *Auricularia* for 1 h in saline (10 W/V%), were tested. The result of the prick-by-prick test showed that the wheal size raw *Auricularia* was 2 mm × 2 mm (+2), its supernatant was 4 mm × 4 mm (+3) and positive control 5 mm × 4 mm (+3) after 15 min of the test. Two healthy volunteers showed negative reactions to the same samples.

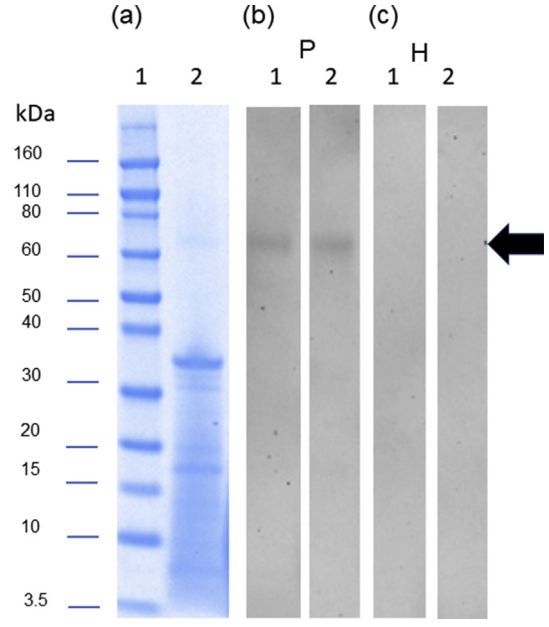

Fig. 1. SDS-polyacrylamide gel electrophoresis (SDS-PAGE) and western blot of *Auricularia*. **(a)** Gel stained with Colloidal Blue Coomassie. Lane 1 = raw *Auricularia*, Lane 2 = boiled *Auricularia*. **(b–c)** Immunoglobulin E (IgE) immunoblotting. **(b)** Patient's serum. **(c)** Serum of healthy volunteer. Lane 1 = raw *Auricularia*, Lane 2 = boiled *Auricularia*.

The proteins from raw and boiled (70 °C for 10 min) *Auricularia* were provided for SDS-polyacrylamide gel electrophoresis. Fractionated protein bands varying from 8 kDa to 66 kDa in molecular weight were visualized using Blue SafeStain (Invitrogen®, Carlsbad, CA, USA) (Fig. 1(a)). IgE immunodetection has been described as previous our report.[1] Western blotting of the patient's serum detected a 66 kDa antigen for both raw and boiled Auricularia while that of healthy subject detected no antigen (Figs. 1(b) and 1(c)). The 66 kDa protein band was excised from the gel, digested with trypsin, and subjected to nano-LC/MS/MS analysis according to the manufacturer's instructions (Japan Proteomics®, Sendai, Japan). Amino acid sequencing identified alpha-mannosidase (XP_007355919.1; accession in NCBI protein database). These data demonstrated that the patient's allergy was caused by IgE-binding alpha-mannosidase from *Auricularia*.

Alpha-mannosidase, an enzyme which hydrolyzes α-type mannose, occurs in higher plants[2] and microorganisms.[3] Recently this enzyme was isolated from *Auricularia polytricha*.[4] Alpha-mannosidase antigens from *Canavalia ensiformis* are composed of two protein components with a weight of 44 and 66 kDa,[5] respectively. Interestingly, the anaphylaxis in the present case was induced only by the 66 kDa component. Furthermore, the 66 kDa component was resistant to heat treatment although many food antigens are usually denatured by heating. In conclusion we show the first report of IgE-mediated anaphylaxis caused by alpha-mannosidase protein from Auricularia auricula-judae. We need to investigate alpha-mannosidase is involved in other mushroom allergy.

Conflict of interest

The authors have no conflict of interest to declare.

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