

LETTERS TO THE EDITOR

Case of food-dependent exercise-induced anaphylaxis due to Japanese apricot and peach: Detection of causative antigens

Dear Editor,

Pickled Japanese apricot, *umeboshi*, and crunchy pickled Japanese apricot, *karikari-ume*, are popular types of pickled fruit in Japan. They are made of Japanese apricot (*Prunus mume*), a member of the Rosaceae family. We here present the first case having two distinct episodes of food-dependent exercise-induced anaphylaxis (FDEIA) due to *karikari-ume* and peach, for which the causative allergens were examined.

A 12-year-old Japanese girl experienced itching of the scalp, nausea, abdominal pain, edema on the lips and face, cough, blurred eyesight and loss of consciousness while jogging 90 min after breakfast. She had eaten rice, miso soup, meatballs and *karikari-ume* for breakfast. Three weeks later, she had the same anaphylactic symptoms while jogging 3 h after lunch at school, which included curry and rice and peach. She was suspected of having a pollen-related Rosaceae family fruit allergy because of the past history of urticaria after an ingestion of peach and the pollinosis in spring.

Total serum immunoglobulin (Ig) E was 1400 U/mL, and antigen-specific IgE test (ImmunoCAP; Phadia, Uppsala, Sweden) results were class 6 for Japanese cedar pollen, class 5 for cypress pollen, class 3 for peach, and class 2 for white birch, orchard grass and alder pollen. Prick-by-prick tests showed 3+ for peach, 2+ for *karikari-ume* and 1+ for *umeboshi*. Furthermore, oral aspirin (500 mg) administration enhanced the areas of wheals. Provocation test with combination challenge with exercise, ingestion of *karikari-ume* and taking of aspirin was positive. Thus, we diagnosed the patient as FDEIA due to

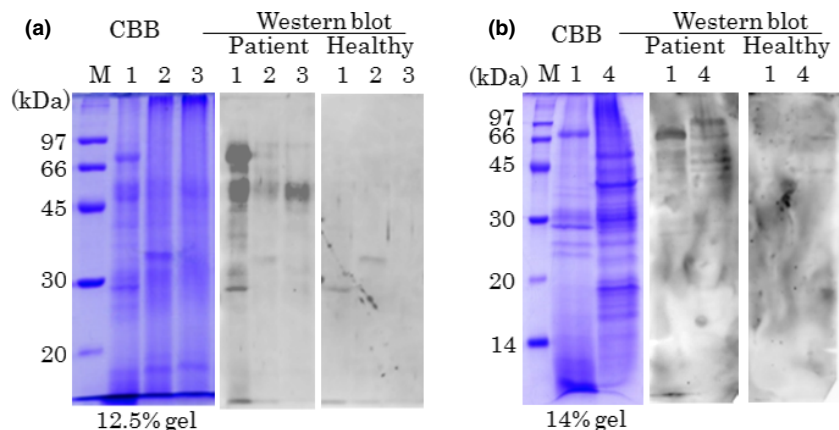
karikari-ume and peach, although a provocation test with peach was not performed.

Immunoglobulin E-binding immunoblot analysis with Japanese apricot flesh showed intense 50–60- and 75-kDa protein bands (Fig. 1a, lane 1). When the apricots were salted and pickled in seasoning liquid, the intensity of the 75-kDa protein bands was reduced (lanes 2 and 3) indicating the 50–60-kDa proteins are major *karikari-ume* allergens. Only two cases of FDEIA induced by *umeboshi* have been reported.^{1,2} Interestingly, the both of them had peach allergy as our case. Unfortunately, the culprit allergenic molecules in *umeboshi* were not examined in the cases.

Pathogenesis-related protein 10 (Pru p 1), thaumatin-like protein (Pru p 2), non-specific lipid transfer protein (Pru p 3), profilin (Pru p 4) and peamaclein (Pru p 7)³ had been identified as peach allergens. Two cases of FDEIA with positive skin prick test by fresh peach and cherry or nectarine were reported, however, IgE-binding to extracted proteins from the fruits and specific IgE level for Pru p 3 were negative.^{4,5} In our patient, no IgE-binding to the peach proteins with a molecular mass of 7–28-kDa corresponding to Pru p 1, 2, 3, 4 and 7 was observed, although several new IgE-binding peach proteins with 45–97-kDa were detected (Fig. 1b, lane 4).

Our results indicate that 50–60- and 45–97-kDa proteins may be new causative antigens in FDEIA due to Japanese apricot and peach, respectively. However, further studies will be needed to clarify the possibility of cross-reaction between apricot and peach allergens.

Figure 1. Results of immunoglobulin (Ig) E immunoblot analysis. (a) Intense bands at 50–60- and 75-kDa were detected using the proteins extracted from Japanese apricot flesh (lane 1). The 75-kDa protein bands were reduced using those from salted apricot (lane 2) and *karikari-ume* (lane 3). (b) Several IgE-binding protein bands around 45–97-kDa were detected in the blotting using peach (lane 4). M, molecular weight markers; 1, Japanese apricot flesh; 2, Japanese apricot (salted); 3, crunchy pickled Japanese apricot (*karikari-ume*); 4, peach flesh.



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CONFLICT OF INTEREST: The authors have no conflict of interest to declare.

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