

Case Report

Anaphylaxis to Weaver Ant Eggs: A Case Report

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*The weaver ants (*Oecophylla maragdina*), the tropical ants commonly found in Asia and Australia, can produce eggs which become the expensive delicacies for Thai people especially in the northern and northeastern part of Thailand. Anaphylactic reaction can occur from the most common triggers of ingested foods and drugs. Some hidden and newly recognized foods are now described as the triggers of anaphylaxis. This is the case report of anaphylaxis to the weaver ant eggs of after ingesting them for 2 hours and produced anaphylactic reactions, including generalized urticaria, angioedema, wheezing and gastrointestinal symptoms. The diagnostic test was performed to confirm IgE-mediated reaction with skin prick test for the fresh weaver ant egg's extract and the result was positive. To date, there is also no information about the exact major allergens of these weaver ant eggs and might need to be further explored.*

Keywords: Food allergy, Anaphylaxis, Weaver ant eggs

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Anaphylaxis is a serious allergic reaction that is rapid in onset and may cause death in healthy individuals. The exact incidence of anaphylaxis in the general population is difficult to estimate because of under-diagnosis and under-reporting^(1,2). However, in Thailand, the incidence rate of anaphylaxis from the large 2 retrospective and observational studies were approximately 46-49 per 100,000 patient-years^(3,4) which is about the same as reported in the United States⁽⁵⁾. Ingested foods and drugs were the most common triggers of anaphylaxis, reported in most of the publications^(1,3-5). The spectrum of common food triggers varies by countries, culture and age of patients. Although cow's milk, egg, peanut, tree nuts, wheat, fish and seafood were found worldwide as implicated foods^(3,6,7), but some hidden foods or newly recognized food triggers, eaten by indigenous peoples may cause anaphylaxis.

Ant sting is another cause of serious allergic reactions and the most medically important aggressive ants, probably caused anaphylaxis, are fire ants of the genus *Solenopsis*⁽⁸⁾ or the imported fire ants. Weaver ants (*Oecophylla maragdina*) are another type of ants

commonly found in Thailand⁽⁹⁾. Basically, weaver ant eggs rarely caused anaphylaxis but their eggs have been cooked as a delicacy, especially in the Northern and North Eastern Thailand. However, isolated anaphylaxis to these weaver ant eggs has rarely been described in the literature. There was only one report about four children who had allergic reactions from eating weaver ant eggs which only two of them had anaphylactic reactions⁽¹⁰⁾. The following case report described a child who developed anaphylaxis after eating weaver ant eggs.

Case Report

A 10-year-old Thai boy presented with sudden onset of swollen eyelids and lips, generalized urticaria, shortness of breath, wheezing and abdominal pain within 2 hours after eating the ant egg salad. He had ever taken this kind of cooked weaver ant eggs, but never experienced symptoms like these before. There were no any other culprit foods or drugs taken at the same time. He had a history of drug allergy which was dicloxacillin, but had never been allergic to any kind of foods. He also has had a medical history of asthma, but was clinically under controlled with inhaled corticosteroid. At the emergency room, he was then diagnosed with anaphylaxis and was promptly treated with adrenaline, antihistamines (H1-receptor antagonist), nebulized salbutamol and systemic corticosteroid and also responded to treatment well.

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To confirm the IgE-mediated anaphylaxis to weaver ant eggs in this patient, four months later the authors then performed the *in vivo* test, which was skin prick test (SPT). Since there was no any commercial extract available for these weaver ant eggs and their composition was still exactly not known, the authors decided to perform SPT with fresh weaver ant eggs instead (Fig. 1) and also the commercial extracts of common food allergens (cow's milk, soy bean, egg white, wheat, shellfish and fish). The fresh weaver ant egg's extract was prepared by crushing one raw ant egg's sac and made up to approximately 1% weight by volume with normal saline. The supernatant was collected to perform SPT. Histamine (10 mg/ml) and normal saline were used as positive and negative controls, respectively. No adverse reactions occurred during performing SPT. SPT was considered positive if the mean-wheal diameter (MWD) was 3 mm larger than negative control.

The results of SPT of this patient to common food allergens were all negative except wheat (4 mm MWD) but he is able to take all wheat composited-foods. SPT with prepared fresh weaver ant eggs was positive significantly (7 mm MWD) compared to negative control (Fig. 2). The specific IgE for these weaver ant eggs was not done since there was no any commercial extract provided and due to laboratory limitation.

Discussion

The weaver ant, which is in the genus *Oecophylla* (Hymenoptera, Formicidae), has only two extant species. One is *Oecophylla longinoda*, distributed in tropical Africa and the other is *Oecophylla maragdina* which found commonly in Australia and southeastern Asia⁽¹¹⁾, including Thailand. Anaphylaxis to ant stings can be occurred from the *Solenopsis* spp and the *Myrmecia* spp, but rarely from the *Oecophylla* spp⁽¹²⁾. There have only been very few case reports of food-induced-anaphylaxis from eating ants and ant eggs⁽¹⁰⁾. However, ant eating is also practiced in Thailand especially in the northern and northeastern part which the eggs of weaver ants are prefer to be cooked as the most favorite dish. The information of their components and major allergens are lacking.

In the present case report, the anaphylaxis is diagnosed by the clinical diagnosis⁽¹³⁾ and the likely causative food related to the time to the onset of anaphylactic symptoms, which usually occurs on the order of minutes to 2 hours from ingestion⁽⁷⁾. To confirm



Fig. 1 Fresh weaver ant eggs



Fig. 2 Positive skin prick test to fresh weaver ant egg's extract

the diagnosis, skin prick test with commercial food extracts or food protein-specific IgE was primarily considered at least 4 weeks after the episode of anaphylaxis. Nevertheless, there is no such commercial extract or specific IgE for the weaver ant eggs available and Rance E et al ever confirmed the good correlations between skin prick tests using commercial extracts and fresh foods for detecting the sensitivity to food allergens⁽¹⁴⁾, then skin prick test to the fresh weaver ant egg's extract was performed and became positive significantly. In fact, oral food challenges (OFC) is the gold standard to identify of specific food triggers, but

with a previous history of anaphylaxis they are not needed⁽⁷⁾, and also the overall concordance between a positive skin prick test and positive challenge was 91.7% with fresh foods, then OFC was not done in this patient. Even though, the skin prick tests for commercial food panels showed a positive result to wheat, but there was no correlation with the patient's history, since he never had any allergic reaction when exposure to wheat before and afterward.

Recently, Lao-araya and Trakultivakorn has ever been reported four children of ant eggs (*O. smaragdina*) allergy, which two of them had anaphylactic reactions after eating raw ant eggs according to the correlation of history and symptoms without performing skin testing or OFC because their parents refused to participate⁽¹⁰⁾, whereas skin prick test with fresh weaver ant egg's extract can be done in our patient to visibly support anaphylaxis to weaver ant eggs.

Finally, this patient was diagnosed anaphylaxis to the weaver ant eggs and was advised to avoid them definitely. He also had risk factors of fatal anaphylaxis since he was in the group of young male children and had history of asthma⁽¹⁵⁾. He was prescribed with self-injectable epinephrine and was taught how to use it.

In conclusion, to date, this is the first case report of an anaphylactic reaction in a patient with a history of asthma after ingestion of the weaver ant eggs that has the positive result of skin testing to support the diagnosis of anaphylaxis to weaver ant eggs. There is still no information about what the major food allergens of the weaver ant eggs are and need more studies to identify.

Potential conflicts of interest

None.

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รายงานผู้ป่วย 1 ราย ที่มีอาการแพ้รุนแรงแบบแอนนาไฟแลกซีสจากการรับประทานไข่มดแดง

สมบุญ จันทรสกุลพร, ยิ่งวรรณ เจริญยิ่ง

มดแดงส้ม (*Oecophylla smaragdina* หรือ Weaver ants) เป็นมดแดงชนิดหนึ่งที่พบได้ในแถบทวีปเอเชียและออสเตรเลีย รวมถึงประเทศไทยมดชนิดนี้สามารถผลิตไข่ที่มีตัวอ่อนดักแด้อยู่ภายในหรือเรียกว่าไข่มดแดง และเป็นอาหารชนิดหนึ่งที่นิยมบริโภคในประเทศไทยโดยเฉพาะบริเวณภาคเหนือและภาคตะวันออกเฉียงเหนือ จนถึงปัจจุบันยังไม่เคยมีรายงานการแพ้รุนแรงจากการรับประทานไข่มดแดง อาการแพ้รุนแรงแบบแอนนาไฟแลกซีสสามารถเกิดจากสาเหตุที่พบได้บ่อย ได้แก่ อาหารและยาเป็นต้น รายงานฉบับนี้จึงเป็นรายงานผู้ป่วยที่รายงานถึงการเกิดอาการแพ้รุนแรงแบบแอนนาไฟแลกซีสในผู้ป่วยเด็กชายอายุ 10 ปี หลังจากรับประทานไข่มดแดงไปประมาณ 2 ชั่วโมง โดยมีอาการผื่นลมพิษทั่วตัว อาการบวมที่ริมฝีปากและเปลือกตา หอบหืดเฉียบพลัน หายใจเสียงวี๊ดและอาการปวดท้อง การยืนยันการแพ้ไข่มดแดงในผู้ป่วยรายนี้ทำโดยการสะกิดผิวหนัง (skin prick test) โดยใช้สารละลายที่สกัดจากไข่มดแดงสดเนื่องจากไม่มีน้ำยาทดสอบมาตรฐาน โดยผลการทดสอบให้ผลบวกร่วมกับประวัติการรับประทานไข่มดแดงที่สอดคล้องกับอาการแพ้รุนแรง จึงให้การวินิจฉัยภาวะแพ้รุนแรงจากการรับประทานไข่มดแดงในผู้ป่วยรายนี้ ดังนั้นในอนาคตการตรวจหาสารประกอบโปรตีนในไข่มดแดงที่ทำให้เกิดอาการแพ้ (major allergens) อาจจำเป็น หากมีรายงานการแพ้ไข่มดแดงมากขึ้น
