# Case Report

# Anaphylactic Reaction to Phuk-Waan-Ban in a Patient with Latex Allergy

Patnarin Stirapongsasuti MD*, Chuchai Tanglertsampan MD*,
Kobkul Aunhachoke MD*, Atik Sangasapaviliya MD**

** Division of Dermatology, Department of Medicine, Faculty of Medicine, Phramongkutklao Hospital, Bangkok, Thailand*
*** Division of Allergy, Department of Medicine, Faculty of Medicine, Phramongkutklao Hospital, Bangkok, Thailand*

*Phuk-waan-ban, Euphorbiaceae Sauropus androgynus (Linn) Merr, belongs to the family Euphorbiaceae, which is the same as the rubber tree, Euphorbiaceae Hevea brasiliensis. The young leaves are edible. To the best of the authors' knowledge, this is the first report of anaphylactic reaction to Phuk-waan-ban in latex allergic patients.*

*Contact urticaria and anaphylactic reactions to latex-containing rubber products are being recognized with increasing frequency in all kinds of medical disciplines. The prevalence and incidence are both increasing. Recently, a number of reports have been published describing anaphylactic reactions to food items in patients with latex allergy. The authors present a patient with occupational natural rubber allergy who developed an anaphylactic reaction with urticarial rash 20-30 minutes after ingestion of phuk-waan-ban. The diagnostic work up showed specific IgE to latex (CAP class 3). Positive skin prick tests to latex and cooked and raw phuk-waan-ban crude extract confirmed allergic reactions. Moreover, the cross-reaction between phuk-waan-ban and latex can be confirmed by using IgE inhibition test.*

**Keywords:** *Latex allergy, Latex-food cross-reaction, Anaphylaxis*

***J Med Assoc Thai 2010; 93 (5): 616-9***
***Full text. e-Journal:*** *http://www.mat.or.th/journal*

Latex or natural rubber is a product of *Hevea brasiliensis*, originated in Brazil. In 1979, Nutter described the first case of contact urticaria from latex[1]. In 1986, Carrillo et al reported a case of occupational contact urticaria, rhinitis, and angioedema caused by sensitization to latex gloves[2]. Since then, numerous cases of IgE-mediated latex allergy have been described. Clinical manifestations vary from urticaria to bronchial asthma or anaphylactic shock.

Several fruits and vegetables have been reported to cause immediate type 1 hypersensitivity reactions in latex-allergic patients due to cross-reactivity. The most frequent (no true prevalence or incidence data available) causative foods were banana, avocado, chestnut, kiwi, and papaya[3-7]. Other isolated reports include potato, eggplant, buckwheat, lychee, fig, chickpea, peach, spinach, and several other fruits[3,10-12].

*Correspondence to: Stirapongsasuti P, Division of Dermatology, 3rd Floor Chalermprakiat Building, Phramongkutklao Hospital, Rajvithi Road, Phayathai, Bangkok 10400, Thailand. Fax: 0-2354-0375. E-mail: patnarins@hotmail.com*

**Case Report**

A 47-year-old nurse presented with swelling of lips and eyelids, pruritus, generalized urticaria, dyspnea, and anaphylactic shock 30 minutes after eating cooked phuk-waan-ban (Fig. 1). A second event occurred 30 minutes after taking a spoon-full of this vegetable soup, presenting as generalized urticaria, swollen lips, and rhinoconjunctivitis symptoms without anaphylactic shock. All other foods were well tolerated. She had a 6-year history of occupational urticaria following daily use of natural rubber latex gloves at work for five years, and seasonal allergic rhinoconjunctivitis for three years. She also had atopic dermatitis in the childhood, which disappeared in adolescence.

The *in vivo* tests were skin prick test with latex solution (methods described in Fisher's Contact Dermatitis)[8] and phuk-waan-ban extracts (raw and cooked). The raw vegetable extract was prepared by grinding 5 grams of fresh phuk-waan-ban and diluted to 1% weight by volume with normal saline. Cooked vegetable extract was prepared by using 5 grams of fresh phuk-waan-ban cooked for 3 minutes in

a microwave oven. The contents were ground and made up to 1% weight by volume with normal saline. The supernatants were collected and passed through a 45-μm filter for skin prick test.

A positive skin prick test (millimeters measurement compared with the positive control) could be shown to raw and cooked phuk-waan-ban extracts at the concentration of 1% weight by volume and latex extract comparing with the positive control (10mg/ml histamine dihydrochloride) and negative control (normal saline) (Fig. 2, 3). Skin prick test with both latex and phuk-waan-ban extracts in four healthy control persons showed a negative result. No adverse reactions were observed during the skin tests.

The total IgE level was not elevated (67.4 kU/l). Serum levels of total IgE and specific IgE for several pollens, weeds, fungi, animal dander, house dust mite, *Acasia*, dried fruits, mustard, shellfish, and latex were determined by Pharmacia Immuno CAP system (CAP/RAST methods, Pharmacia Diagnostics, Sweden). Specific IgE against latex was 8.75 kU/l (CAP class 3). Both foods and aeroallergens RAST were negative. The authors could not perform RAST inhibition test due to laboratory limitation.

**Fig. 1** Fresh Phuk-waan-ban

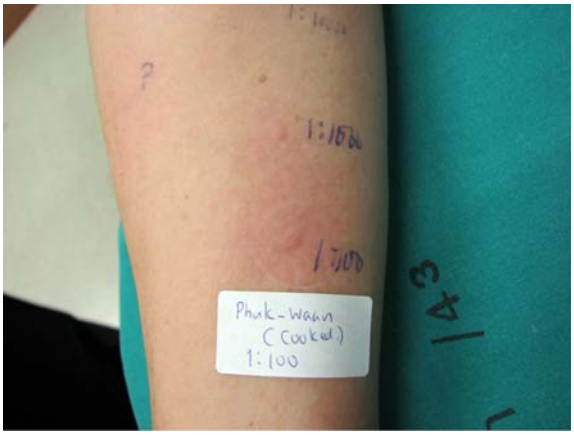


**Fig. 2** Positive reaction to cooked phuk-waan-ban


**Fig. 3** Positive reaction to raw phuk-waan-bans

## Discussion

Latex allergy is an occupational disease occurring in hospital personnel, patients who have had many operations, spina bifida patients, or persons with professions that involve prolonged and repeated exposure to latex. Various studies show that average evolution time, from the onset of latex clinical manifestations until diagnosis, was 4.5 years[3]. Diagnostic sensitivity of CAP/RAST to latex in relation to the clinical history and skin prick test was 80%[3]. There was no relation between total IgE and latex-specific IgE.

Latex is an important allergen that shares antigenic determinants with various fruits and vegetables. It is not yet elucidated on the antigens of the cross-reacting plant species whether it is the plants latex or other chemical compounds. Latex and food allergies were diagnosed on the basis of a suggestive clinical history, a positive skin test to the corresponding allergen, RAST (radioallergosorbent test), and RAST inhibition test.

Phuk-waan-ban is a native plant of some Asian countries, belonging to *Euphorbiaceae*. There are many other names, *e.g.* so-kun-mu (Chinese), rurudama no (Japanese), sweet bush, or katuk (English).

Phuk-waan-ban is in the same family as the rubber tree, thus, there is a possibility to cross-react with latex. There have been many reports on constrictive obliterative bronchitis/bronchiolitis from ingesting the juice of the plant[13,14]. The precise mechanism that led to the segmental necrosis of many small bronchi is uncertain. However, the pathologic changes were most consistent with chronic ischemia. *Sauropus androgynus* leaf contains about 580 mg of alkaloid papaverine per 100 g fresh leaf[15,16]. The major chemical essential oil constituents are carvacrol methyl ether (49.35%), thymol (14.67%), and butylated hydroxytoluene (10.5%). All other oil compounds are usually less than 2%. Excessive consumption of the leaf reportedly caused dizziness, drowsiness, and constipation. However, anaphylactic reaction and cross-reaction of this vegetable with latex have not been reported. The information on its chemical constituents that might cause the cross-reaction with latex in the literature is lacking.

To confirm *in vivo*, the diagnosis of latex allergy associated with food allergy in a patient with a suggestive clinical history, skin prick tests with the latex and food extracts are helpful. Some clinicians prefer fresh extracts to standardized allergen, particularly when testing fruits and vegetables that are prone to degradation[9]. Reviews of medical records concerning skin prick or puncture testing with foods indicate a low rate of systemic reactions, although such reactions may occur[17,18]. Nevertheless, as anaphylactic reactions during skin testing with latex extracts have been reported, caution must be taken. These reported reactions might be related to the use of multi-test prick devices or to different antigenic extraction procedures. For ethical reasons, the authors did not perform the oral challenge test with phuk-waan-ban.

As shown in many papers in the literature, atopy represents the major risk factor for clinically relevant symptoms to latex. The presented patient showed an atopic disposition and suffered from seasonal allergic rhinoconjunctivitis. She was advised to avoid latex gloves/products at work and at home, and phuk-waan-ban. The patient was recommended to use gloves made from alternative materials. Nitrile, vinyl, and neoprene gloves have been found to be acceptable alternatives for medical use, although none matches latex for feel and elasticity.

In summary, the authors report a patient with occupational latex allergy who developed an anaphylactic reaction after ingestion of phuk-waan-ban.

**References**


1. Nutter AF. Contact urticaria to rubber. Br J Dermatol 1979; 101: 597-8.
2. Carrillo T, Cuevas M, Munoz T, Hinojosa M, Moneo I. Contact urticaria and rhinitis from latex surgical gloves. Contact Dermatitis 1986; 15: 69-72.
3. Blanco C, Carrillo T, Castillo R, Quiralte J, Cuevas M. Latex allergy: clinical features and cross-reactivity with fruits. Ann Allergy 1994; 73: 309-14.
4. Fern□ndez de Corres L, Moneo I, Mu□oz D, Bernaola G, Fern□ndez E, Audicana M, et al. Sensitization from chestnuts and bananas in patients with urticaria and anaphylaxis from contact with latex. Ann Allergy 1993; 70: 35-9.
5. Cinquetti M, Peroni D, Vinco A, Zoppi G. Latex allergy in a child with banana anaphylaxis. Acta Paediatr 1995; 84: 709-10.
6. Lucas JS, Lewis SA, Hourihane JO. Kiwi fruit allergy: a review. Pediatr Allergy Immunol 2003; 14: 420-8.
7. Vandenplas O, Vandezande LM, Halloy JL, Delwiche JP, Jamart J, Looze Y. Association between sensitization to natural rubber latex and papain. J Allergy Clin Immunol 1996; 97: 1421-4.
8. Rietschel RL, Fowler JF. Allergy to rubber. In: Rietschel RL, Fowler JF, editors. Fisher's contact dermatitis. 5th ed. Philadelphia: Lippincott Williams & Wilkins; 2001: 111-24.
9. Ortolani C, Ispano M, Pastorello EA, Ansaloni R, Magri GC. Comparison of results of skin prick tests (with fresh foods and commercial food extracts) and RAST in 100 patients with oral allergy syndrome. J Allergy Clin Immunol 1989; 83: 683-90.
10. Lee J, Cho YS, Park SY, Lee CK, Yoo B, Moon HB, et al. Eggplant anaphylaxis in a patient with latex allergy. J Allergy Clin Immunol 2004; 113: 995-6.
11. Schiffner R, Przybilla B, Burgdorff T, Landthaler M, Stolz W. Anaphylaxis to buckwheat. Allergy 2001; 56: 1020-1.
12. Niggemann B, Reibel S, Hipler C, Wahn U. Anaphylactic reaction to lychee in a 12-year-old girl: cross-reactivity to latex? Pediatr Allergy Immunol 2002; 13: 64-7.
13. Onakahara K, Higashimoto I, Matsuyama W, Osame M, Hasegawa Y, Shimokata K, et al. National research of *Sauropus androgynus* associated pulmonary disorder in Japan and immuno-histochemical analysis of *Sauropus androgynus* associated bronchiolitis obliterans. Bimansei Haishikkan ni kansuru Chosa Kenkyuhan

Heisei 17 Nendo Kenkyu Hokokusho 2006; Accession number; 06A0594650: 177-81. [In Japanese].
14. Chang YL, Yao YT, Wang NS, Lee YC. Segmental necrosis of small bronchi after prolonged intakes of Sauropus androgynus in Taiwan. Am J Respir Crit Care Med 1998; 157: 594-8.
15. Bender AE, Ismail KS. Nutritive value and toxicity of a Malaysian food, *Sauropus albicans*. Plant Foods Man 1975; 1: 139-43.
16. Padmavathi P, Rao MP. Nutritive value of Sauropus androgynus leaves. Plant Foods Hum Nutr 1990; 40: 107-13.
17. Food allergy: a practice parameter. Ann Allergy Asthma Immunol 2006; 96(3 Suppl 2): S1-68.
18. Novembre E, Bernardini R, Bertini G, Massai G, Vierucci A. Skin-prick-test-induced anaphylaxis. Allergy 1995; 50: 511-3.

## *รายงานผู้ป่วยการแพ้ผักหวานบ้านแบบแอนนาไฟแลกซิสในผู้ป่วยที่แพ้ยางพารา*

***ภัทร์นฤน สถิรพงษะสุทธิ, ชูชัย ตั้งเลิศสัมพันธ์, กอบกุล อุณหโชค, อธิก แสงอสภวิริยะ***

*ผักหวานบ้านมีชื่อทางวิทยาศาสตร์ว่า Sauropus androgynus (Linn.) Merr เป็นผักพื้นบ้านที่พบได้หลายประเทศในแถบเอเชีย จัดอยู่ในวงศ์ Euphorbiaceae เช่นเดียวกับยางพารา (Hevea brasiliensis) ส่วนใบนำมาใช้ประกอบอาหารได้ ซึ่งมีรสหวานและมีวิตามินสูง จึงมีผู้นิยมนำมารับประทานมากขึ้นในประเทศไทย รายงานฉบับนี้ เป็นรายงานฉบับแรกที่กล่าวถึงการเกิดภาวะแอนนาไฟแลกซิส จากการรับประทานผักหวานบ้านในผู้ที่แพ้ยางพารา*

*การแพ้แบบผื่นลมพิษสัมผัส และการเกิดภาวะแอนนาไฟแลกซิสจากผลิตภัณฑ์ยางพาราได้เป็นที่รู้จักและพบมากขึ้นในวงการแพทย์ ปัจจุบันมีการรายงานถึงผู้ป่วยที่แพ้ยางพาราแล้วเกิดแอนนาไฟแลกซิส ภายหลังจากการรับประทานอาหารบางชนิดให้พบเห็นอยู่บ่อย ๆ รายงานฉบับนี้จะกล่าวถึงผู้ป่วยหญิงไทย อายุ 47 ปี อาชีพผู้ช่วยพยาบาลที่มีประวัติแพ้ถุงมือยาง โดยมีอาการเป็นผื่นลมพิษทุกครั้งที่ใช้ และหลังจากผู้ป่วยรับประทานผักหวานบ้าน 30 นาที ได้เกิดอาการปากบวม ตาบวม คันตามตัว และมีผื่นลมพิษทั้งตัว แน่นหน้าอก และมีภาวะช็อก หลังจากนั้นผู้ป่วยได้ลองรับประทานน้ำแกงต้มผักหวานบ้านอีกครั้งก็มีอาการปากบวม ตาบวม และมีผื่นลมพิษขึ้นที่ตัว 20-30 นาที หลังรับประทาน จากการตรวจพิเศษทางห้องปฏิบัติการ พบระดับอิมมูโนโกลบูลินอี ต่อลาเท็กซ์ในซีรั่มสูง (RAST class 3) การทำ skin prick test จะช่วยยืนยันการวินิจฉัยการแพ้ผักหวานบ้าน นอกจากนั้นการเกิดปฏิกิริยาข้ามกลุ่มระหว่างยางพาราและผักหวานบ้านอาจใช้การทำ IgE inhibition test เป็นตัวช่วย ในการวินิจฉัยได้*