Botanical Briefs: Cashew Apple (*Anacardium occidentale*)

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Practice Points

- Patient history is important to help diagnose allergic reaction to foods.
- Patients exposed to similar components may be at risk for anaphylaxis with reexposure.

Ethnic diversity in the United States has increased the presence of a variety of exotic foods. A lack of knowledge about certain foods, including fruits that are not native to the United States, can lead to ingestion of allergenic or even toxic substances. Allergy to cashew apple exemplifies the importance of issuing warnings for potentially allergenic foods that may not be well known and of exhibiting caution before consuming these products.

Cutaneous Manifestations

Cashew apples (*Anacardium occidentale*)(Figure 1) often are found in Latin American and Indian markets in the United States. Cutaneous manifestations of an allergy to cashew apple can include an eruption similar to poison ivy dermatitis, as the cashew urushiols (eg, cardol, anacardic acid) share a common molecular skeleton with the sensitizing 3-pentadecylcatechol of poison ivy and poison oak.[1-5] Additionally, synthesis of other allergenic proteins that may cause an IgE reaction in individuals who are allergic to cashews (eg, vicilin, legumin) may occur directly in the apple.[6]

Figure 1. Cashew apples.

Allergic manifestations of cashew apple hypersensitivity include pruritus of the exposed skin as well as papules and vesicles. The toxin may spread from one area of the skin to another.[3-5] In some cases, clinical presentation may include skin roughness as well as fissuring and irritation of the fingers after handling the nut attached to the cashew apple.[7] Those patients who are sensitized by prior exposure to cashew apples may present with a variety of systemic reactions.[8] Sensitization to the chemical after exposure may cause allergic contact dermatitis; however, when the same chemical or a chemically similar compound is ingested systemically, a generalized eczematous dermatitis may develop. Systemic cashew nut dermatitis

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manifests as a diffuse macular and papular exanthem, primarily in the flexural areas of the body with involvement of the axillae, eyelids, lateral neck, and genital area; desquamation of the hands and feet; vesiculation of the oral mucosa; and occasionally pruritus ani (Figure 2). In addition to generalized dermatitis, ingestion of cashew products contaminated with shell oil may cause gastroenteritis or perianal dermatitis.[5]

Distribution

Cashew apples grow in tropical climates and are native to Brazil and the West Indies. The cashew apple also has been introduced into Central America, Asia, Africa, and the Far East. Cashew nuts are cultivated in Vietnam, Thailand, India, and Brazil, with the latter being the main producer of cashew apple juice.[8]

Identifying Features

The cashew tree generally is bushy with low branches and may reach 35 ft in height and width. Its leaves are leathery and can be found in terminal clusters, typically oblong to oval shaped (4–8×2–4 in). Yellowish pink flowers with 5 petals are borne in 6- to 10-in terminal panicles. The cashew nut is the true fruit of the tree, which consists of a double shell containing a caustic phenolic resin enclosing the edible cashew nut. The cashew nut bears a 2- to 4.5-in, plump, fleshy, pear-shaped or rhomboid to ovate receptacle with waxy yellow, red, or red-yellow skin, and a fibrous, spongy, juicy, yellow pulp known as the cashew apple.[9]

Figure 2. Allergic skin eruption following ingestion of a cashew apple.

Dermatitis-Inducing Plant Parts

Several components of the cashew tree, especially those areas containing cashew oil, have been reported to cause dermatologic reactions in sensitized individuals.[3,5] Presentations can range from localized cutaneous to systemic dermatitis; anaphylaxis could occur.[3-5]

Other sources of allergens have been found in the cashew apple using immunoblotting methods, identifying vicilin and legumin as causes of cashew nut allergy.[10] Irritation of the skin, eyes, and mucous membranes also may occur from fumes of fires used for roasting cashews.[8]

Cases of allergic reactions to cashew nuts, cashew nut oil, and cashew nut shells have been reported,[8] as well as 1 report of cross-reaction of a cashew apple in a patient presenting with a mango allergy.[8,11]

Nomenclature

The cashew tree is a member of the Anacardiaceae family, which includes the common poison ivy (*Toxicodendron radicans*), poison oak (*Toxicodendron pubescens* and *Toxicodenron diversilobum*), poison sumac (*Toxicodendron vernix*), mango tree (*Mangifera indica*), lacquer tree (*Toxicodendron vernicifluum*), Indian marking nut tree (*Semecarpus anacardium*), and rengas tree (*Gluta renghas*).[12]

Allergens

The main allergens present in cashew nuts are the urushiols cardol and anacardic acid.[1,2] The allergens vicilin and legumin, which are known to cause cashew nut allergy, also have been found in the cashew apple.[9]

Because cashew nut urushiols have sensitizing molecules that are similar to those found in poison ivy, poison oak, and other members of the Anacardiaceae family, these groups may cross-react.[1,2] In one study, patients with cashew nut allergies also reported allergies to walnuts, pecans, almonds, sunflower seeds, peanuts, tree nuts, and pistachios, with the most commonly shared reaction being throat swelling.[9] Another report described an anaphylactic response to mango fruit in a woman who demonstrated positive results to Indian dill and cashew apple with skin-prick testing.[11]

Testing for cashew apple allergy may be necessary to establish the diagnosis, as patients may not recognize an association between contact with the fruit

and onset of symptoms. Patients may demonstrate a marked erythematous and urticarial response following direct application of the outer shell and pulp of the cashew apple to scratched skin; however, such testing should not be done unless the physician is prepared to treat anaphylaxis.

Clinical Uses

Cashew apple juice is rich in sugars,[13,14] antioxidants,[15,16] and vitamin C,[13] and is widely consumed in tropical countries.[9] Even though this product is not currently available in the United States, production and distribution of cashew apple juice is increasing. Also, cashew apple juice has the potential to be a natural source of vitamin C and sugar in processed foods.[17]

Cashew nut oil also is used to manufacture certain resins and plastics, which are incorporated into brake linings and electrical insulation materials.[18] Additionally, it is utilized to produce printing ink, insecticides, waterproofing substances, preservatives for fishing equipment, paint, varnishes, enamels, plastics, phenol-formaldehyde resins, gloss for vanilla beans, indigenous medicines, and drink stirrers. Sap from the bark of the cashew tree also can serve as marking ink.[19] Additionally, a yellow gum derived from cashew wood can be used as a varnish, insect repellent, and substitute for gum in adhesives; contact with this substance may result in blistering of the skin. Lastly, oil from the cashew kernel can be found in salad dressings and is not known to be allergenic.[8]

Conclusion

Cashew apples commonly are found in Latin American, Indian, and Nicaraguan markets and stores in the United States. Individuals who are not familiar with this food and the toxic nature of its shell if consumed raw may be at risk for a reaction. Allergy to cashew apple exemplifies the importance of food warnings for products that may not be well known to everyone and of exhibiting caution before consuming these products.

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