

Contact urticaria and contact sensitization to yucca (*Yucca gigantea* Lem.) in a plant keeper

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It is well known that occupational exposure to pollens of flowering ornamental plants may elicit rhinoconjunctivitis, asthma, and contact urticaria (1). However, it was not until the 1980s that a foliage decorative plant, weeping fig (*Ficus benjamina*), was recognized as an important cause of occupational immediate mucosal and skin reactions, and, to a lesser degree, of similar symptoms in atopics which were non-occupationally exposed (2, 3). A few species of the genus *Yucca*, which are also used as an ornamental indoor foliage plant in colder climates, have been reported to cause

rhinitis and contact urticaria (4–6). Contact sensitization to *Yucca* species, on the other hand, has not been reported previously in the English-language literature.

Case History

A 48-year-old female plant caretaker was referred by a dermatologist in private practice on suspicion of occupational contact dermatitis. Her past medical history included hay fever since the age of 12 years, but never asthma or atopic dermatitis. She was a skilled greenhouse gardener, and had worked as a plant keeper in various public buildings for ~25 years. She had suffered from occupational rhinoconjunctivitis for 10–15 years, and suspected weeping figs to be the main allergenic plants; she therefore tried to avoid contact with these. Her present complaints were occupational dermatitis of the hands, arms and, possibly, legs for 1.5 years, and occasional

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Fig. 1. *Yucca gigantea* Lem. (formerly incorrectly named *Yucca elephantipes* Regel ex Trel.) Photograph: Odense University Hospital.

wheals. She suspected *Ficus* species and yucca (*Yucca gigantea*, formerly incorrectly named *Yucca elephantipes* Regel ex Trel.) (Fig. 1) to be the causes of the dermatitis and contact urticaria, respectively. Her work with the plants included (re)potting, sprinkling, dusting, and manual cleansing of the leaves. Patch testing with the baseline series and standard prick tests prior to referral gave negative results.

Patch testing at our department was performed with the baseline series (including TRUE Test[®] Panel 1–3 and various pet.-based allergens) supplemented with various Compositae (Asteraceae) plant extracts and allergens, as well as the patient's own plants. The patch test materials were applied to the back for 2 days with 8-mm Finn Chambers[®] on Scanpor[®] tape (SmartPractice[®], Phoenix, AZ, USA), and readings were performed on D3 and D7, according to the criteria of the ICDRG (7). The patch testing showed 2+ reactions to methylchloroisothiazolinone/methylisothiazolinone, methylisothiazolinone, and yucca leaf wetted with water (Fig. 2). Yucca leaf wetted with ethanol elicited no reaction. Twenty-five consecutive eczema patients tested with yucca leaves wetted with water and ethanol showed no reactions.

Prick tests elicited small positive reactions to birch and grass pollen, and large positive reactions to latex, weeping fig (leaf and stalk), yucca leaf, spathe flower (*Spathiphyllum*



Fig. 2. Positive patch test reaction to yucca leaf wetted with water.

wallisii) (pollen, leaf, and stalk), and another *Ficus* species (stalk). A radioallergosorbent test (RAST) for latex showed a slightly elevated level (0.84 IU/l). A histamine release test was positive for weeping fig, but negative for yucca. The occupational hand eczema cleared after the patient started using gloves, but recurred now and then. The mucosal symptoms and contact urticaria cleared after the use of antihistamines.

Discussion

The genus *Yucca* belongs to the asparagalean family Asparagaceae, subfamily Agavoideae (8). It contains ~40 species, originating from Central America. In natural surroundings, the tallest of the yuccas can reach a height of 9 m and have 1-m-long leaves. Today, the yuccas are used in food preparations, and they have antifungal activities that can be of use in agricultural production (9). In the Western world, yuccas are currently used as indoor evergreen ornamental plants.

Mahillon et al. reported a surprisingly high prevalence of positive prick test reactions to yucca, on a par with that of weeping fig, in their study of 59 persons with perennial rhinitis, tested with their own ornamental plants (4). The authors concluded that yucca and other indoor plants were potential allergens (4). Kanerva et al. also described positive prick test reactions to yucca and weeping fig in a plant keeper with protein contact dermatitis and mucosal symptoms caused by spathe flower (5). Likewise, in another Finnish case report, *Yucca aloifolia*, weeping fig and spathe flower caused occupational contact urticaria in an atopic plant caretaker (6). The prick test reactions to the three plants were strongly positive, and the RAST was positive for weeping fig and spathe flower and negative for yucca, but the contact urticaria was diagnosed as immunological (6). A more unequivocal allergic reaction

was reported in an Italian non-atopic male who was exposed to *Yucca filamentosa* in his garden. His urticaria, angioedema and mucosal symptoms were ascribed to an IgE-mediated reaction to airborne *Yucca filamentosa* leaf particulates, on the basis of a positive prick by prick reaction and a positive RAST result (10).

Like the 2 patients in the Finnish case reports, the present patient had positive prick test reactions to both weeping fig, yucca, and spathe flower (5, 6). The plants belong to three different families (Moraceae, Asparagaceae, and Araceae), and, as the last two are related, the reactions may reflect either cross-reactivity, as suggested by Kanerva et al., or co-sensitization because of frequent exposure to these three species (5). Although positive prick test reactions in patients and negative results in controls in previous case reports supported immunological contact urticaria caused by indoor yucca plants, the negative RAST results could not confirm an IgE-mediated allergy (5, 6). Likewise, the histamine release test – which is not allergy-specific, as basophils may release histamine both as an IgE-mediated reaction and as an unspecific reaction – gave a negative result in the present case (11). The positive RAST result for latex was probably induced by cross-reactivity to weeping fig allergens (12). Any possible allergen in yucca causing contact urticaria is thus unknown.

Poljacki et al. patch tested 8 patients with phytocontact dermatitis with a variety of fresh plants, and reported positive

reactions to 'yucca', but, according to the abstract, it was apparently not considered to be an allergic reaction (13). Kanerva et al. reported slightly irritant patch test reactions to 'yucca', and the present case is thus the first supporting a true contact allergy (5). As the patient had absolutely no reaction to a piece of yucca leaf wetted with ethanol, the contact allergen of yucca seems to be water-soluble.

Immediate and delayed contact reactions may be caused by the same compound, for instance cinnamal and nickel (14). However, the two reactions may also be elicited by different allergens from the same source: contact with lettuce (*Lactuca sativa*) may result in contact dermatitis caused by the sesquiterpene lactone lactucin and immediate reactions caused by a lipid transfer protein (15). It is thus possible that a protein from yucca may cause both contact urticaria and contact allergy. Although the contact allergy to yucca was not the only explanation for the patient's dermatitis, it may have been a contributory factor. At any rate, the risk of sensitization to yucca in certain occupations is high enough to justify testing for immediate allergy, and, in the case of positive reactions, further testing for contact sensitization should be carried out.

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