

Fingertip Dermatitis in a Retail Florist

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*Prevalence of plant contact dermatitis in retail florists varies with exposure, and the number of reports of contact allergy to cut tulips is rather small. Alpha-methylene- γ -butyrolactone is better known as the cause of both *Alstroemeria* dermatitis in retail florists and tulip finger in wholesale floral workers who handle the bulbs. Our patient presented with prominent erythema, scaling, and peeling of the skin of the thumb, index, and middle fingers of his right hand. Results of a patch test to α -methylene- γ -butyrolactone were strongly positive, and the patient determined that the exposure had occurred when he stripped leaves from the tulip stems to arrange cut flowers. Other natural sources of the antigen include *Alstroemeria*; *Bomarea*; *Dioscorea hispida*; *Erythronium*; *Gagea*; *Fritillaria*; and at least one species of onion, *Allium triquetrum*.*

Plant sensitivity, although not necessarily the cause of contact dermatitis in a retail florist, should be suspected in such a case. Sometimes the specific cause of plant dermatitis is strongly suggested by the patient's presentation and occupation. Examples of occupation-related sensitivities are poison-ivy dermatitis, primula sensitivity, garlic dermatitis, and *Compositae* sensitivity. Retail florists are exposed to a large variety of plant species, including many exotics. Results of studies seeking the most prevalent species causing sensitivity in retail florists vary according to the country where the study was done. In the United States, reactions to *Alstroemeria* are common in retail florists.¹ We recently treated a retail florist who presented with contact dermatitis in a pattern typical for *Alstroemeria* dermatitis,² even though he was rarely exposed to that genus. The eruption seen with *Alstroemeria* is very similar to tulip finger, a condition our patient denied having, which is seen especially in collectors, sorters, and packers of tulip bulbs.³ Sensitivity to cut tulips seems to be less common, based on the scarcity of reports. However,

our patient had a history of exposure to tulips as cut flowers, so he was tested for sensitivity to that plant and the plant's associated allergen.

Case Report

A 61-year-old retail florist presented with an eruption on the thumb, index, and middle fingers of his right hand. He had a history of an eczematous eruption on his hands for much of his life, but recently a prominent eruption appeared on the distal 2.5 cm of the right thumb, the right index finger, and the radial aspect of the left index finger. He reported that the eruption was only occasionally pruritic. He had no known allergies.

The patient's work involved administrative duties, sales, and flower arranging. In the latter activity, he was exposed to a wide variety of potted and cut flowers and fern, including *Agapanthus*, *Anemone*, *Aster*, baby eucalyptus, *Calla*, *Calluna* (heather), *Campanula* (Canterbury-bells), carnations, *Chrysanthemum* spp (chrysanthemums and daisies), *Crocosmia*, *Dahlia*, *Daucus carota* (Queen Anne's lace), *Delphinium* (larkspur), *Diosma*, ferns, freesia, *Gardenia*, *Genista*, Gerbera daisy, *Gladiolus*, *Gypsophila* (baby's breath), heather, *Hydrangea*, *Iris*, *Lisianthus*, *Leptospermum*, *Liatris*, lilies (Casa Blanca, Enchantment, and other hybrids), *Moluccella laevis* (bells of Ireland), orchids, *Phlox*, pussy willow, red rovers, roses, snapdragons, *Solidago* (goldenrod), *Spathiphyllum* sumac, spider lily, stargazers, sunflowers, tuberose, tulips, waxflower, yarrow, and *Zinnia*. He denied using *Alstroemeria*, although others in the shop used them for arrangements.

He also handled wet foam for fresh flowers, floral tape, and green-dyed wooden pegs used in cut and potted plants. He stated that he held flower arrangements with the left hand as he placed individual flowers and fern in the arrangement. He denied exposure to adhesives, paint, anaerobic sealants, acrylics, or strong irritants. He wore vinyl gloves to protect his hands, but only after the eruption had started, and they did not seem to help.

Physical examination revealed a severe hyperkeratotic eczematous eruption of the thumb and index finger of the patient's right hand (Figure 1) and a faint scaling erythema of the index finger on the left

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Figure 1. Severe hyperkeratotic eczematous eruption of the patient's thumb and index finger of the right hand.

hand. The remainder of the examination yielded negative results.

Patch test results were strongly positive to α -methylene- γ -butyrolactone 0.01% in petrolatum and positive, but much less prominently, to the tulip stem, leaf, and petal (Figure 2).

Following the positive patch test results, the patient found that his exposure was associated with stripping the leaves from the cut tulip flowers with his right hand (while holding them in the left hand) before using them in the flower arrangements.

Comment

Today's cultivated tulips are said to be derived from *Tulipa gesnerana*, which was brought from Turkey to the medicinal garden of the University of Leiden in 1593. Their precise medical usage at that time is unknown.⁴ Even at that early date, these plants were perhaps already cultivars from the original species. Today, tulip cultivars number approximately 2500.⁴

Although allergic reactions to tulip bulbs are extremely common in commercial handlers, reactions to cut flowers also occur.⁵⁻⁷ The hard skin of the bulb, the tecta, seems to be both irritating and the source of the antigen that causes tulip finger. Bulbs are handled in separating "bulblets" and in sorting and preparing bulbs for shipping. Sometimes specialty growers remove the bottom part of the tecta to promote early, synchronized growth. Dust particles in the workplace also may be a source of airborne dermatitis.⁸ Bruynzeel⁴ says that workers know of tulip finger, but because they are seasonally employed, they handle the problem by stopping work and do not seek medical attention. The pub-



Figure 2. The type of commercial cut tulip used by the patient in arrangements of cut flowers.

lished percentages of affected workers in the industry range from 4% to 85%, but none are reliable because the condition is underreported.⁴

The bulb contains more antigen than other parts of the plant: less is found in the leaves and stem, and the least is found in the petals.⁹ Fingertip dermatitis is common in persons sensitive to tulip bulbs and cut flowers, as well as in those who break out in reaction to *Alstroemeria*.² Some nursery workers also experience dermatitis of the forearms, face, and neck. Contact dermatitis to tulip is common among workers in the bulb industry, although few of these cases are brought to the attention of dermatologists. Hjorth and Wilkinson⁹ also assumed that this was because most of the harvesters were seasonal workers who simply left the occupation if they became sensitized. Sensitivity to cut flowers can occur when, in April or May, tulip bulbs are separated from the flowers either by machine or hand,⁹ and especially when bulbs of harvested flowers are split to elongate the stem.¹⁰ These occurrences are not surprising because the same allergen is present in all 3 instances of exposure.

Tulip sensitivity is caused by an allergy to α -methylene- γ -butyrolactone (Figure 3) or tulipalin A,¹¹ which is derived from the glycoside tuliposide A. Both tuliposide A and its hydroxy derivative, tuliposide B, have fungistatic and bacteriostatic properties. Tuliposide A is converted to glucose and tulipalin A by hydrolysis. The allergenic chemical is found in quantity in several of the lily floras, including *Alstroemeria* (Peruvian or Inca lily), *Bomarea*, *Erythronium* (dog tooth violet, trout lily, adder's tongue), and *Tulipa*.⁸ It is present in lesser amounts in *Dioscorea hispida*, *Fritillaria*, and *Gagea*⁸ and in at

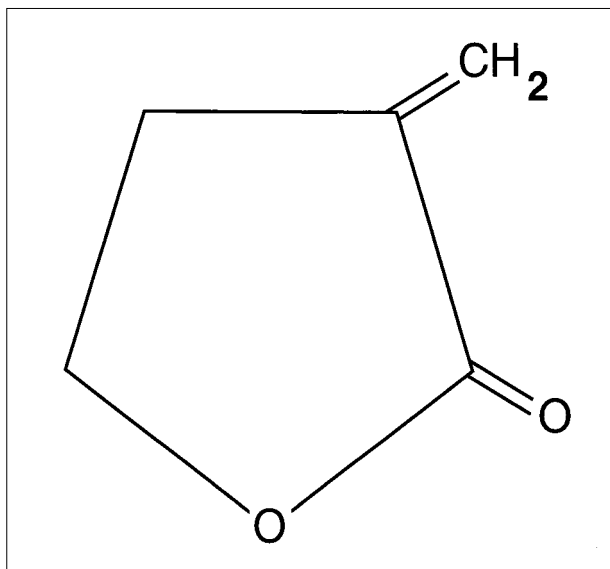


Figure 3. Alpha-methylene- γ -butyrolactone.

least one species of onion, *Allium triquetrum*.¹² Tuliposides A and B¹³ have antifungal properties useful to the plant,¹⁴ but the former produces the allergen by hydrolysis.¹¹ In one series, 9 of 10 tulip varieties were equally potent, with the Red Emperor variety being slightly less allergenic. Bruynzeel⁴ lists Clara Butt, Le Nôtre, Preludium, and Rose Copeland as more problematic varieties.

Because the allergen penetrates latex and vinyl gloves, protective gloves should be used when handling tulips and *Alstroemeria*. Sensitive retail florists need a safe work area where other workers are not likely to leave surfaces contaminated by the allergen. Avoidance of direct and indirect contact with all genera containing the allergen is recommended.²

Conclusion

Contact dermatitis to cut tulips seems to be less common, but the presentation is similar to that seen with *Alstroemeria* and tulip bulbs. All of these sources are associated with sensitivity to the same antigen, α -methylene- γ -butyrolactone. The medical workup of a patient, therefore, should not stop with finding a positive patch test reaction to the commercial antigen but should include identification of the causative plant so that it can be avoided. For allergic

persons who must handle a wide variety of plants, providing them with a list of plants containing the same antigen will help them to avoid other sources of the same allergen.

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