

Botanical Briefs: Tulips—*Tulipa* Species L.

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Figure 1. Tulip bulbs. Tuliposide A, a glycoside, is found in the white epidermis of the tulip bulb (center). The leathery tecta contain the fibers that lead to irritant dermatitis (outer bulbs).

Clinical Importance/ Cutaneous Manifestations

Tulips have long been known to cause occupational hand dermatitis in gardeners, florists, and nursery workers.¹ *Tulipa* species, Asteraceae (eg, chrysanthemums, sunflowers, daisies), Alstroemeriaceae (Peruvian lily), and Primulaceae (primrose), are the most frequent elicitors of contact dermatitis in the flower industry.^{2,3} However, symptoms from tulips tend to be seasonal and mild, often going unreported. Classically, individuals with “tulip fingers” demonstrate erythema and scaling of the fingertips and peringual areas, most commonly on the first and second digits of the dominant hand, as is the case in garlic hand dermatitis.⁴ This combined allergic and irritant reaction can later result in hyperkeratosis and fissuring. Although this classic appearance sometimes occurs, a diffuse dry hand dermatitis is the most common manifestation. Interestingly, paresthesia and tenderness (known as “tulip fire”) may appear on the fingertips within several hours of handling tulip

bulbs in a high percentage of workers.⁵ In severe cases, granulation tissue may form beneath the nail plate leading to onycholysis, transverse splits, and subungual abscesses.

Secondary spread can result in more extensive involvement, with eczematous papules and plaques appearing on the arms, face, neck, and genitalia. Most reactions result from direct contact with bulbs (Figure 1) or cut flowers. However, dust in the workplace also can cause conjunctivitis, rhinitis, and asthma, as well as airborne contact dermatitis with severe disseminated cutaneous reactions.⁶ In a study of tulip nursery workers, 18% were found to be allergic to tulipalin A, the primary allergen in tulips.⁷

Family/Distribution of Plant

Tulipa species belong to the Liliaceae family. Tulips are native to Turkey and were introduced to Western Europe in the 16th century. Largely due to widespread cultivation by Dutch horticulturalists in the 17th century, more than 100 colorful and divergent species can now be found around the globe.

Nomenclature

Tulipa, the botanical name for tulip, is derived from the Turkish word for turban (*tulpend*), to which this flower bears some resemblance. The hundreds of tulip cultivars are classified into 15 horticultural divisions.

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The authors report no conflict of interest.

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Figure 2. Close-up of a tulip's cup-shaped flower. Tulip flowers have relatively high concentrations of tuliposide A compared to their bulbs.

Identifying Features/Plant Facts

Tulips are erect plants with solitary flowers emerging from the tips of stems. Leaves are long and broad with parallel veins. The flowers usually are solitary and cup-shaped (Figure 2), with a wide range of solid color presentations (Figure 3). Individual tulips with various colors, called *broken tulips*, result from viral diseases transmitted by aphids.

Arguably, no other flower can rival the tulip for its historic influence on economic policy or for its status as a cultural symbol of Europe during the 17th century. In the mid 16th century, imported tulips from the Ottoman Empire became one of the most sought-after luxury items in Western Europe. Soon thereafter, a Dutch botanist named Clusius began cultivating a multitude of new color variations. The most vibrant and beautiful of these new cultivars were able to demand exorbitant prices, peaking in the "tulip mania" of the 1630s. Speculators began trading promissory notes on future tulip deliveries in what became known as *tulpenwindhandel*, which literally translated to "tulip wind trade." The resultant economic chaos culminated in severe governmental economic controls in 1637.⁸

Allergens

Following trauma to the plant, tuliposide A is converted by acidic hydrolysis to the primary allergen, tulipalin A. Tuliposide A is found in the white epidermis of tulip bulbs and in the stems, flowers, and



Figure 3. Multiple tulips seen in spring at the Dallas Botanical Gardens.

leaves of the plant. The highest concentration of tuliposide A is in the bulbs, especially in the epidermis of the scales. Allergenicity fluctuates seasonally, with a rapid reduction in tuliposide A content in the outermost scales immediately before the harvest period. During this period, this peripheral layer forms a leathery skin that is not allergenic.⁹ In addition, different cultivars appear to have varying allergenicities, with Rose Copeland and praeludium implicated as the most notorious offenders. Tuliposide A is not confined to *Tulipa* species, as it leads to allergic reactions in the Alstroemeriaceae family and in other Liliaceae genera. Tuliposide B is found in tulips in lower concentrations than tuliposide A, and its product, tulipalin B, is much less allergenic than tulipalin A.¹⁰

REFERENCES

1. Welker WH, Rappaport BZ. Dermatitis due to tulip bulbs. *J Allergy*. 1932;3:317.
2. Thiboutot DM, Hamory BH, Marks JG. Dermatoses among floral shop workers. *J Am Acad Dermatol*. 1990;22:54-58.
3. Gette MT, Marks, JE. Tulip fingers. *Arch Dermatol*. 1990;126:203-205.
4. McGovern TW, Crawford GH. Botanical dermatology. Available at: <http://www.emedicine.com/derm/topic904.htm>. Accessed April 18, 2003.
5. Bertwistle AP. Tulip fingers. *Br Med J*. 1937;2:255.
6. Hausen BM. Airborne contact dermatitis caused by tulip bulbs. *J Am Acad Dermatol*. 1982;7:500-503.
7. Bruze M, Bjorkner B, Hellstrom AC. Occupational dermatoses in nursery workers. *Am J Contact Dermat*. 1996;7:100-103.
8. Garber PM. Tulipmania. *J Polit Econ*. 1989;97:535-560.
9. Schmidt RJ. Botanical dermatology database. Available at: <http://bodd.cf.ac.uk>. Accessed July 29, 2002.
10. Bruynzeel DP. Bulb dermatitis. dermatological problems in flower bulb industries. *Contact Dermat*. 1997;37:70-77.