

Botanical Briefs: Daffodils (*Narcissus* Species)

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PRACTICE POINTS

- *Narcissus* species are thought to be the most common cause of irritant contact dermatitis among florists.
- Use of protective gloves and clothing to prevent *Narcissus*-induced contact dermatitis is recommended.

Daffodils (*Narcissus* species) are the most common cause of irritant contact dermatitis among florists. Calcium oxalate crystals contained in the sap of the daffodil plants lead to irritant contact dermatitis on the skin. Daffodil rash commonly presents with fissuring, scaling, and erythema of the fingertips, hands, and forearms. The best preventative measure is to wear appropriate protective gloves and clothing.

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Contact dermatitis is a common problem in the floral bulb industry and is considered an occupational disease. Daffodils (*Narcissus* species) (Figure) are thought to be the most common cause of irritant contact dermatitis among florists.¹

Clinical Importance

Picking daffodils can start as early as October, when the flowers are still closed. The picker's hand slides down the stem to snap the stalk at the base. This potentially traumatic maneuver to the web of the fingers leads to abrasions, which are irritated by the sap and cause granulomatous sores and paronychia. An experienced picker can pick 20,000 flowers a day, leading to extensive contact with sap.²

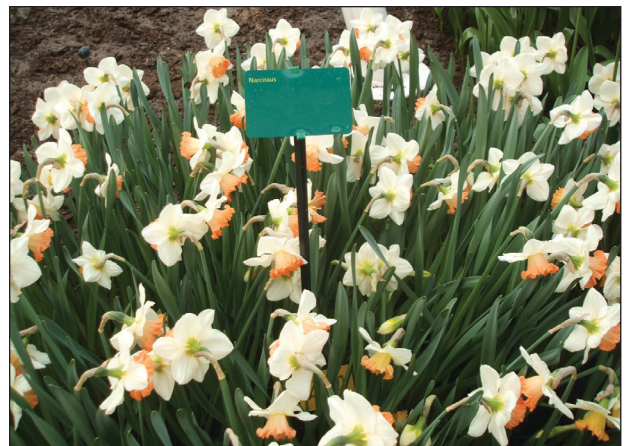
Eczematous or granulomatous rash on the arms also is seen as the sap irritates the wrist and forearm. The pickers often hold the flowers until a bunch of 10 has been collected. The 10 flowers are held together by a rubber band and stacked along the arm, the chin, and the axilla, causing the rash to extend to those areas. Sap also can be transferred by the hand

to other parts of the body, such as the face. In men, sap can be transferred to the genitalia as the men urinate in the field.

Narcissus also can cause poisoning if ingested by humans or animals. Researchers who analyzed calls made to the New Zealand Natural Poisons Centre between 2003 and 2010 determined that daffodil was the 11th most common call for plant-related poisoning.³

Although the severity of plant poisoning often is low due to the small amount of plant material usually consumed, more severe poisoning can occur when the plant is eaten for medicinal purposes or mistaken for an edible plant.³ Vomiting, respiratory symptoms, abdominal pain, diarrhea, trembling, and convulsions can occur when daffodils are ingested. Death has been reported due to ingestion of the bulbs.⁴

In February 2010, 10 children aged 10 and 11 years and their 22-year-old guide presented to an emergency department in Israel after ingesting *Narcissus* bulbs, which were mistakenly believed to be the bulbs of onions.⁴ Eight



Daffodils (*Narcissus pseudonarcissus*).

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children and the guide vomited. One child and the guide reported abdominal pain. All were discharged in stable condition after 4 hours of observation.⁴

Clinical Manifestations

Daffodil rash or lily rash was first described in 1910.⁵ The typical rash presents as dryness, fissures, scaling, and erythema of the fingertips, hands, and forearms, often with subungual hyperkeratosis. Vesicles and pustules may be seen. The rash may extend to other areas of the body, including the face.⁶

Prevention and Treatment

Use of protective gloves and clothing to avoid contact with the plant is recommended.² Treatment includes stopping contact with the irritant, eye irrigation, and supportive measures (airway, breathing, and circulation). Activated charcoal can be helpful if used within 1 hour after ingestion but is contraindicated in vomiting patients.⁴

Identifying Features

The genus *Narcissus* is in the family Amaryllidaceae and contains ornamental plants, including daffodil (trumpet *Narcissus*, *Narcissus pseudonarcissus*), jonquil (*Narcissus jonquilla*), and poet's narcissus (*Narcissus poeticus*). Most species are perennial; the plant emerges from a bulb in spring. Leaves originate from the base of the plant and range from 5-cm to 1.2-meters long, depending on the species. The flowers span a range of shapes and colors—from a trumpet (the daffodil) to a ringlike cup (poet's *Narcissus*) and in yellow, white, and pink.⁷

Distribution and Plant Facts

Distribution—There are approximately 80 to 100 wild *Narcissus* species, which are found in southwestern Europe, North Africa, the Balkan Peninsula, Italy, and France. There are more than 27,000 *Narcissus* cultivars registered in the International Daffodil Register.⁸

Plant Facts—The daffodil is the national flower of Wales. It also is often used to depict hope and joy and is the symbol of cancer charities in many countries.⁹

The name *Narcissus* is believed to have originated from Greek mythology. A handsome youth, Narcissus, fell in love with his own reflection, for which the gods punished him by turning him into a flower.¹⁰

Another theory states that *Narcissus* is derived from the Greek word *narkao* (to numb) due to its narcotic properties. When an open wound is subjected to an extract of the bulb, numbness of the entire nervous system is said to occur as well as paralysis of the heart. This narcotic effect led Socrates to refer to the *Narcissus* plant as the “chaplet of the infernal gods.”¹¹

Narcissus is an important flower in various ethnic rituals. The Greeks often planted daffodils near tombs. In Muslim culture, white is believed to be the symbol of good and purity; *Narcissus* was one of the most common white-flowered plants found in Muslim graveyards.¹²

Medicinal Qualities and Uses—*Narcissus* species have been used as medicinal plants for a variety of ailments. For example, *Narcissus tazetta* contains flavonoids, alkaloids, saponins, tannins, cardiac glycosides, oil, steroids, terpenoids, and anthraquinones that contribute to its antibacterial, antifungal, antiviral, antimalarial, anticancer, antioxidant, dermatologic, cardiovascular, immunomodulatory, and acetylcholinesterase inhibitory effects.¹³ In a study, chloroform extracts from *N tazetta* bulbs were found to be more active than doxorubicin against hepatocellular and colon cancer cell lines.¹⁴

More than 500 alkaloids have been isolated from the *Narcissus* genus.¹⁵ In 2001, the US Food and Drug Administration approved one of the alkaloids, galantamine, for the treatment of mild to moderate stages of Alzheimer disease.¹⁶ Galantamine selectively and reversibly inhibits acetylcholinesterase, the enzyme believed responsible for neurodegeneration seen in Alzheimer disease. Plants are the main source of galantamine, despite the ability of pharmaceutical companies to synthesize the compound. Galantamine hydrobromide is sold by prescription (Razadyne [Janssen Pharmaceuticals, Inc]); generic formulations approved by the US Food and Drug Administration have been produced by more than 15 pharmaceutical companies.^{17,18}

Irritant and Allergen

Sap found in the bulbs and hollow stems of *Narcissus* contains calcium oxalate crystals, or raphides. The minute, needle-shaped calcium oxalate crystals are believed to be a waste product of cellular metabolism.¹⁹ When the plant structure is compromised by pickers snapping the stalk, the sharp crystals penetrate the skin to cause an irritant contact dermatitis.

Relevant Research—A study used electron microscopy to characterize the structure of raphides from various plants,² though not from *Narcissus* species; the structure of each raphide was then compared to the degree of irritation it produced. The researchers concluded that more elongated crystals (those containing barbs) produce a greater degree of irritation. *Narcissus* species are known to cause varying degrees of skin irritation: For example, *N tazetta* rarely causes skin irritation, whereas *N pseudonarcissi* (daffodil) tends to cause remarkably more skin irritation.²

Allergic reactions to and strong toxicity from *Narcissus* species are not well understood. In a study, only 2 alkaloids—homolycorine and masonin—produced a weakly positive reaction in patch tests on sensitized guinea pigs, which correlates with the finding of a different study, in which only 2 of 12 patients whose findings were examined over 14 years had a positive patch test for *Narcissus*.^{20,21}

However, IgE-mediated allergies indicative of an allergic response to *Narcissus* have been reported. A study isolated an allergenic protein, narcin, from bulbs of *N tazetta*. Narcin is a 13-kDa protein with potent allergenic effects capable of inducing production of proinflammatory

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cytokines and increasing IgE levels in mononuclear cells in peripheral blood.²²

More research is required to find and understand the compounds responsible for causing an allergic reaction to *Narcissus*.

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