

Botanical Briefs: The Sunflower— *Helianthus* Species L.

Glen H. Crawford, MD; Thomas W. McGovern, MD

Clinical Importance/ Cutaneous Manifestations

Sunflowers, the popular herbs of the *Helianthus* genus, have been a reported cause of occupational contact dermatitis for nearly a century in persons who harvest the plant or process its products.¹ As with dermatitis from other Asteraceae plants, contact dermatitis from sunflowers may present in a diffuse pattern across exposed skin surfaces, mimicking photodermatitis.² Unlike photosensitive dermatoses, diffuse Asteraceae dermatitis involves eyelids, melolabial folds, retroauricular sulci, and antecubital fossae. Additionally, anaphylactic reactions after consumption of sunflower seeds^{3,4} and sensitization to *Helianthus* pollen in populations living in areas where sunflowers are grown have been well documented.⁵

Sunflowers are the most commercially important plants of the Asteraceae family and are cultivated primarily for the oils extracted from their seeds. These oils are used for cooking, margarine, lubrication, soaps, salad dressings, candles, paints, and varnishes. In addition, sunflower kernels can be used to feed livestock, produce flour, and provide a popular salted or roasted snack. The flowers can produce a yellow dye, and the plants can be used for fodder and livestock bedding.

Revered by numerous ancient cultures for its resemblance to the sun, this flower harmoniously turns to mirror the sun's radiant energy as it passes overhead. American Indians, in what is now the western United States, and Incas in Peru cultivated sunflowers thousands of years ago. Russians

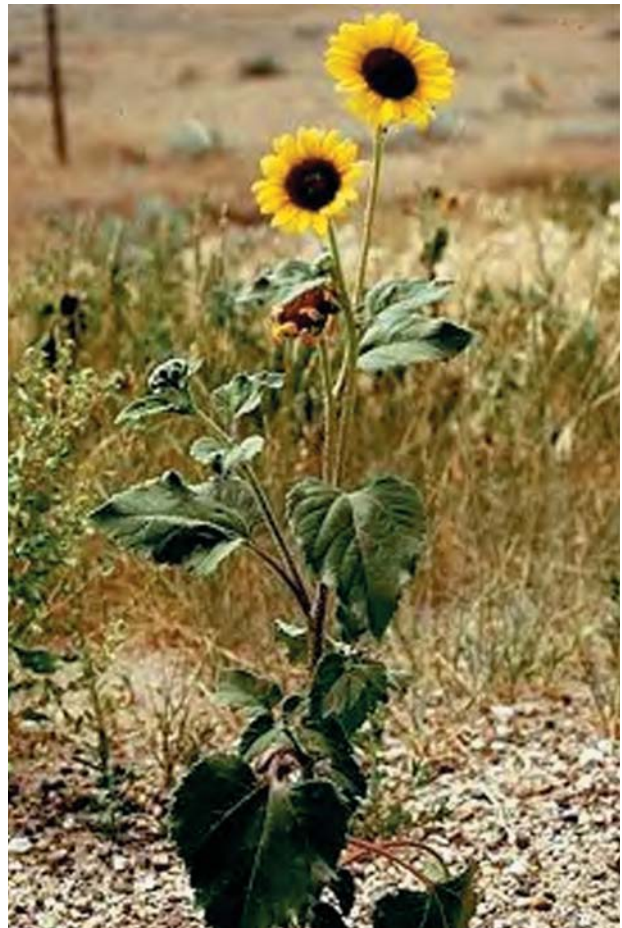


Figure 1. *Helianthus annuus* L. (common sunflower). (Photograph courtesy of Robert R. Kowal and the Wisconsin State Herbarium [www.botany.wisc.edu/wisflora].)

were the first to grow sunflowers on a large scale in the 16th century. These cultivated species were then reintroduced to America and the world for their useful products and beauty. Sunflowers are now the world's second most abundant source of edible oil.

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Dr. Crawford is from University of Pennsylvania Medical Center, Philadelphia. Dr. McGovern is from Fort Wayne Dermatology, Indiana. Reprints: Glen H. Crawford, MD, Department of Dermatology, 2 Rhoads Pavilion, 3600 Spruce St, Philadelphia, PA 19104-4283 (e-mail: glen.crawford@uphs.upenn.edu).

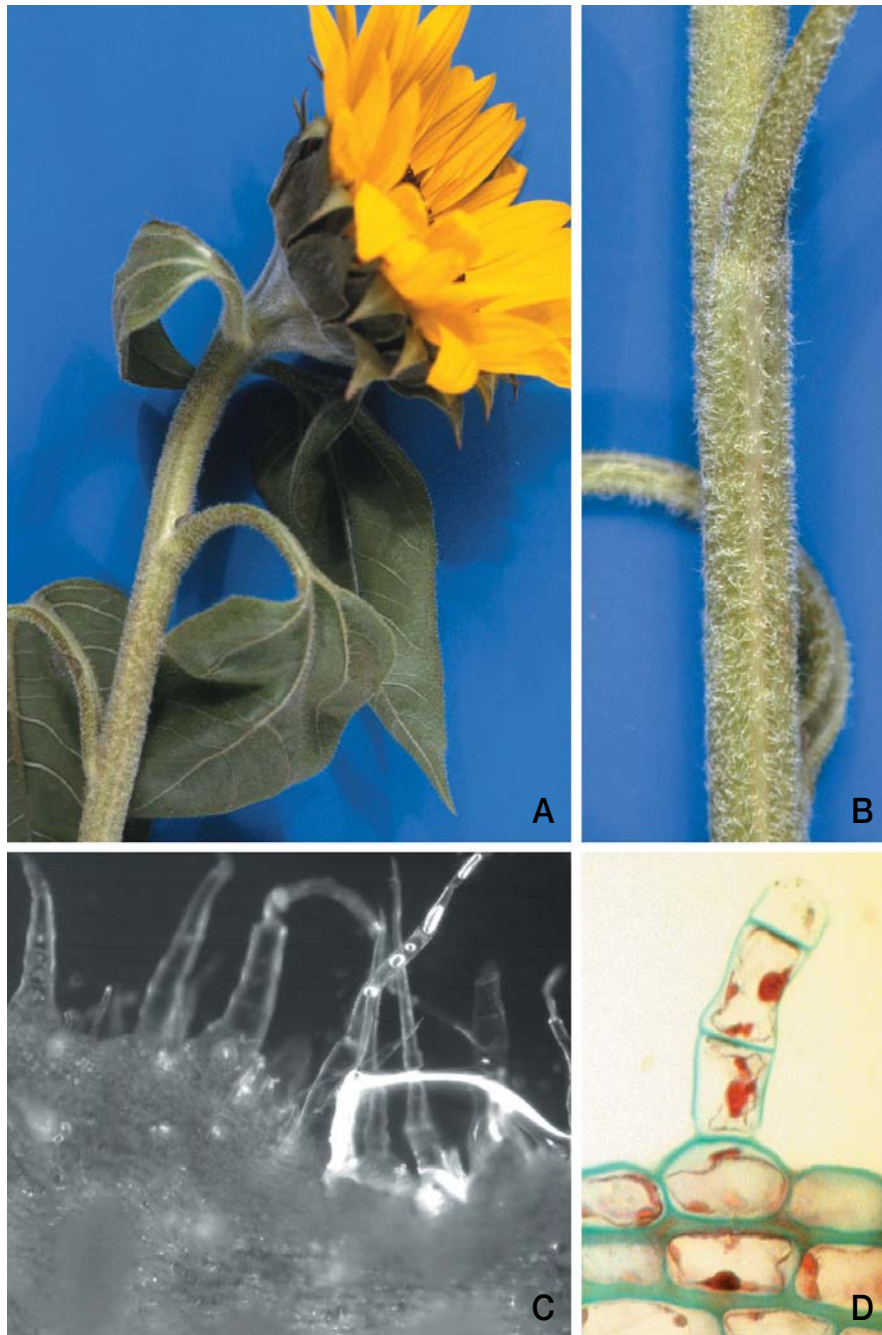


Figure 2. Overview of the common sunflower (A). Low-power magnification image of stem surface trichomes (B). High-power magnification of fresh specimen (negative image)(C). High-power magnification of prepared slide specimen demonstrating a multicellular, uniseriate (one cell thick) trichome (D). (Photograph courtesy of Jamie Cowgur and Kathleen B. Pigg, PhD, Department of Plant Biology, Arizona State University.)

Family/Distribution of Plant

The sunflower is a member of the Asteraceae family (also known as Compositae). The *Helianthus* genus, native to the Americas, contains more than 110 species and is now distributed almost worldwide.

Nomenclature

The name *Helianthus* derives from the Greek words for sun (*helios*) and flower (*anthos*). The term

sunflower, when not supported by a specific binomial epithet, usually refers to *Helianthus annuus* L. (the common sunflower).

Identifying Features/Plant Facts

Helianthus species are annual and perennial herbaceous plants, some of which may attain a height of more than 3 m (12 ft). The blossoms contain multiple florets, which emerge from a central dark

disk to form a radiate head (Figure 1).⁶ All of the perennials have yellow blossoms, although *H annuus* (an annual) may appear reddish, pale, or deep yellow. The shifting orientation of the flower toward the sun, known as phototropism, is caused by a growth-promoting auxin concentrated in the shaded side of stems (Cholodny-Went theory).

Allergens

The main sensitizers, sesquiterpene lactones (SQLs), are concentrated on hairlike epidermal appendages (multicellular capitate glandular trichomes), with the greatest quantity present on the undersurfaces of leaves and on the flowering heads (Figure 2).⁷ Seven SQLs have been collected from these trichomes. The strongest clinical responses in laboratory experiments appear to be from 1-O-methyl-4,5-dihydroxyniveusin A.⁷ However, the full complement of SQLs should be considered responsible for the sensitization. Contact dermatitis can result from direct contact with trichomes on causative plants or via airborne contact from windswept dried leaves. Severe systemic reactions, including anaphylaxis, generalized urticaria, and bronchial asthma, have been reported from ingestion of sunflower seeds.^{8,9} Three cases may have

been sensitized by inhalation of sunflower seed allergens from home-kept bird cages.³

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