

Botanical Briefs: Fig Phytophotodermatitis (*Ficus carica*)

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PRACTICE POINTS

- Exposure to the components of the common fig tree (*Ficus carica*) can induce phytophotodermatitis.
- Notable postinflammatory hyperpigmentation typically occurs in the healing stage of fig phytophotodermatitis.

Patients presenting with a linear, erythematous, blistering eruption may experience a sudden painful sunburn that seems to get worse rather than better with time. In warm climates, exposure to the common fig tree (*Ficus carica*) may be the culprit. Dermatologists should recognize fig phytophotodermatitis as a possible cause and help the patient connect their symptoms with the inciting agent as well as administer proper treatment.

Plant Parts and Nomenclature

Ficus carica (common fig) is a deciduous shrub or small tree with smooth gray bark that can grow up to 10 m in height (Figure 1). It is characterized by many spreading branches, but the trunk rarely grows beyond a diameter of 7 in. Its hairy leaves are coarse on the upper side and soft underneath with 3 to 7 deep lobes that can extend up to 25 cm in length or width; the leaves grow individually, alternating along the sides of the branches. Fig trees often can be seen adorning yards, gardens, and parks, especially in tropical and subtropical climates. *Ficus carica* should not be confused with *Ficus benjamina* (weeping fig), a

common ornamental tree that also is used to provide shade in hot climates, though both can cause phototoxic skin eruptions.

The common fig tree originated in the Mediterranean and western Asia¹ and has been cultivated by humans since the second and third millennia BC for its fruit, which commonly is used to sweeten cookies, cakes, and jams.² Figs are the most commonly mentioned food plant in the Bible, with at least 56 references in the Old and New Testaments.³ The “fruit” technically is a syconium—a hollow fleshy receptacle with a small opening at the apex



FIGURE 1. *Ficus carica* (common fig).

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partly closed by small scales. It can be obovoid, turbinate, or pear shaped; can be 1 to 4 inches long; and can vary in color from yellowish green to coppery, bronze, or dark purple (Figure 2).

Ficus carica is a member of the Moraceae family (derived from the Latin name for the mulberry tree), which includes 53 genera and approximately 1400 species, of which about 850 belong to the genus *Ficus* (the Latin name for a fig tree). The term *carica* likely comes from the Latin word *carricare* (to load) to describe a tree loaded with figs. Family members include trees, shrubs, lianas, and herbs that usually contain laticifers with a milky latex.

Traditional Uses

For centuries, components of the fig tree have been used in herbal teas and pastes to treat ailments ranging from sore throats to diarrhea, though there is no evidence to support their efficacy.⁴ Ancient Indians and Egyptians used plants such as the common fig tree containing furocoumarins to induce hyperpigmentation in vitiligo.⁵

Phototoxic Components

The leaves and sap of the common fig tree contain psoralens, which are members of the furocoumarin group of chemical compounds and are the source of its



FIGURE 2. Immature fruit of the common fig tree.

phototoxicity. The fruit does not contain psoralens.⁶⁻⁹ The tree also produces proteolytic enzymes such as protease, amylase, ficin, triterpenoids, and lipodiastase that enhance its phototoxic effects.⁸ Exposure to UV light between 320 and 400 nm following contact with these phototoxic components triggers a reaction in the skin over the course of 1 to 3 days.⁵ The psoralens bind in epidermal cells, cross-link the DNA, and cause cell-membrane destruction, leading to edema and necrosis.¹⁰ The delay in symptoms may be attributed to the time needed to synthesize acute-phase reaction proteins such as tumor necrosis factor α and IL-1.¹¹ In spring and summer months, an increased concentration of psoralens in the leaves and sap contribute to an increased incidence of phytophotodermatitis.⁹ Humidity and sweat also increase the percutaneous absorption of psoralens.^{12,13}

Allergens

Fig trees produce a latex protein that can cause cross-reactive hypersensitivity reactions in those allergic to *F benjamina* latex and rubber latex.⁶ The latex proteins in fig trees can act as airborne respiratory allergens. Ingestion of figs can produce anaphylactic reactions in those sensitized to rubber latex and *F benjamina* latex.⁷ Other plant families associated with phototoxic reactions include Rutaceae (lemon, lime, bitter orange), Apiaceae (formerly Umbelliferae)(carrot, parsnip, parsley, dill, celery, hogweed), and Fabaceae (prairie turnip).

Cutaneous Manifestations

Most cases of fig phytophotodermatitis begin with burning, pain, and/or itching within hours of sunlight exposure in areas of the skin that encountered components of the fig tree, often in a linear pattern. The affected areas become erythematous and edematous with formation of bullae and unilocular vesicles over the course of 1 to 3 days.^{12,14,15} Lesions may extend beyond the region of



FIGURE 3. Leaves and milky sap of the common fig tree. Image provided with permission by Scott Norton, MD, MPH, MSc (Washington, DC).

contact with the fig tree as they spread across the skin due to sweat or friction, and pain may linger even after the lesions resolve.^{12,13,16} Adults who handle fig trees (eg, pruning) are susceptible to phototoxic reactions, especially those using chain saws or other mechanisms that result in spray exposure, as the photosensitizing sap permeates the wood and bark of the entire tree (Figure 3).¹⁷ Similarly, children who handle fig leaves or sap during outdoor play can develop bullous eruptions. Severe cases have resulted in hospital admission after prolonged exposure.¹⁶ Additionally, irritant dermatitis may arise from contact with the trichomes or “hairs” on various parts of the plant.

Patients who use natural remedies containing components of the fig tree without the supervision of a medical provider put themselves at risk for unsafe or unwanted adverse effects, such as phytophotodermatitis.^{12,15,16,18} An entire family presented with burns after they applied fig leaf extract to the skin prior to tanning outside in the sun.¹⁹ A 42-year-old woman acquired a severe burn covering 81% of the body surface after topically applying fig leaf tea to the skin as a tanning agent.²⁰ A subset of patients ingesting or applying fig tree components for conditions such as vitiligo, dermatitis, onychomycosis, and motor retardation developed similar cutaneous reactions.^{13,14,21,22} Lesions resembling finger marks can raise concerns for potential abuse or neglect in children.²²

The differential diagnosis for fig phytophotodermatitis includes sunburn, chemical burns, drug-related photosensitivity, infectious lesions (eg, herpes simplex, bullous impetigo, Lyme disease, superficial lymphangitis), connective tissue disease (eg, systemic lupus erythematosus), contact dermatitis, and nonaccidental trauma.^{12,15,18} Compared to sunburn, phytophotodermatitis tends to increase in severity over days following exposure and heals with dramatic hyperpigmentation, which also prompts visits to dermatology.¹²

Treatment

Treatment of fig phytophotodermatitis chiefly is symptomatic, including analgesia, appropriate wound care, and infection prophylaxis. Topical and systemic corticosteroids may aid in the resolution of moderate to severe reactions.^{15,23,24} Even severe injuries over small areas or mild injuries to a high percentage of the total body surface area may require treatment in a burn unit. Patients should be encouraged to use mineral-based sunscreens on the affected areas to reduce the risk for hyperpigmentation. Individuals who regularly handle fig trees should use contact barriers including gloves and protective clothing (eg, long-sleeved shirts, long pants).

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