

Botanical Briefs: Common Ivy (*Hedera helix*)

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Clinical Importance and Cutaneous Manifestations

Hedera helix, commonly known as English ivy or common ivy, is a familiar ornamental plant found both indoors and outdoors. It can cause allergic and irritant dermatitis as well as occupational asthma.^{1,2} Affected individuals commonly demonstrate an acute, pruritic, vesicular dermatitis similar to poison ivy.³⁻⁶ The mechanism is a type IV hypersensitivity reaction to an allergen that is distinct from poison ivy.⁷ The rash is found on exposed areas, usually the hands, face, arms, and neck, and may be in a linear distribution. Heat and perspiration can facilitate the reaction and the presence of a puncture wound immediately preceding the exposure may result in a severe response.⁶ Noncutaneous manifestations include persistent rhinitis, cough, and dyspnea.²

Contact dermatitis generally requires exposure to the leaves, stems, or roots of the plant, usually from pruning by gardeners and florists. While most reported cases resulted from contact with a bruised portion of the plant,³ Mahillon et al⁸ found that continuous chronic exposure to the plant in public and workplaces may lead to sensitization from the undamaged plant. Caretakers of the plant tend to have more severe responses compared to gardeners, with the most frequently reported manifestations being asthmatic bronchitis, allergic rhinoconjunctivitis, and cutaneous symptoms. Among gardeners, symptoms appear to be more dependent on the working environment than the season when the

plant is encountered and typically present within 8 hours to 3 days after exposure.⁹

Affected individuals respond to oral and topical steroids and the rash usually resolves within 10 days.⁶ Avoidance of the plant is the best method to prevent recurrence.¹⁰ Respiratory symptoms respond to typical asthma medications including inhaled steroids and beta-agonists.²

Family and Distribution of Plants

The plant division of Magnoliophyta is made of the Liliopsida class and the Magnoliopsida class.¹¹ *Hedera* is a genus of the latter class in the plant family Araliaceae (ginseng) and within the order Apiales. There are 15 species of *Hedera*, with *H helix* containing a subspecies, *H helix* subsp *canariensis*.

Evidence of the existence of the *Hedera* genus dates back 5.8 million years.¹² Common ivy is distributed worldwide, especially in moist shaded areas of temperate climates. It is prevalent throughout the British Isles and can be found climbing trees, walls, cliffs, within foliage, or as a lush carpet on the woodland floors (Figure 1). Despite the worldwide distribution of *H helix*, reported cases of contact dermatitis remain concentrated in Europe,^{1,2,4-7} Canada,³ and the United States.¹⁰

Identifying Features and Plant Facts

Common ivy can be found in various forms such as an herb, climbing vine, and even a tree.¹² It is composed of woody stems with shiny dark green leaves with a lighter green undersurface and pale veins (Figure 2). The adult and juvenile forms of leaves differ in appearance, with the adults having large, radially symmetric, ovate leaves and the juveniles with alternately arranged, palmately lobed leaves.¹² Ivy can grow aggressively, especially in moist fertile soils, and has been called a forest weed, but little evidence

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The authors report no conflict of interest.

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Figure 1. Common ivy can be found climbing trees, walls, or cliffs (A and B).

exists to prove it actually harms or kills the trees on which it grows.

While it is primarily used as a decorative plant, other uses have been described in the literature, including anticellulite creams, shampoos,¹ and antimicrobial and antifungal agents.¹³ Leaf extracts from *H helix* have been used in the treatment of respiratory ailments, though no substantial benefit over conventional treatment has been demonstrated.^{14,15} Ivy also has been used to decrease the risk for fire in dry areas because of its high water content and slow burning quality.¹²

Allergens

The extract of *H helix* is comprised of 13 different phenolic compounds and contains 2 allergens, falcarinol and didehydrofalcarinol.^{1,16} These polyacetylenic compounds are powerful irritants and sensitizers, with falcarinol being the more potent sensitizer of the two.¹⁷ Concentrations of the 2 allergens and ratios to each other differ substantially throughout the year, with August



Figure 2. Common ivy has shiny dark green leaves with pale veins.

requiring the lowest concentration of extract to initiate skin irritation.¹ The allergens are alkylating agents that react easily with amino or protein groups that facilitate covalent binding to surface markers present on immunocompetent cells, such as macrophages and Langerhans cells within the skin. Patch testing can be performed by applying a fresh leaf and/or stems directly to the skin, but it is important to note that direct testing with leaves can cause invasive fungal infection. Both allergens also are potent irritants, so they are tested in low concentrations, such as falcarinol 0.001% to 0.003% or didehydrofalcarinol 0.3% to 1% in petrolatum or ethanol.^{1,5,6}

Falcarinol is not unique to *H helix*. Within the celery family, carrots, celery, and parsnips all include falcarinol, as well as ginseng and *Schefflera* species, which are found in the same family as common ivy.^{1,17} Plants previously reported as having cross-reactions to *H helix*, such as *Brassaia actinophylla*, *Dendropanax trifidus*, *Fatsia japonica*, and *Fatsihedera lizei*,^{3,14,18} most likely were all responding to one constituent—falcarinol.¹

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