

Botanical Briefs: The Scourge of India— *Parthenium hysterophorus* L.

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Clinical Importance

Parthenium hysterophorus caused a fair amount of allergic contact dermatitis in the southern United States in the middle part of the 20th century, but with the mechanization of agriculture, its incidence has decreased. Unfortunately, *P. hysterophorus* has become a major health and agricultural problem in India because of its allergenicity, aggressiveness, and prolific growth.

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Cutaneous Manifestations

Typically, a single area of the body develops an acute allergic contact dermatitis following exposure. With time, however, a more widespread eruption develops that may even involve unexposed sites. The eyelids, melolabial folds, retroauricular sulci, and antecubital fossae are generally involved and give the impression of an airborne contact dermatitis. A chronic, lichenified, eczematous, and intensely pruritic eruption eventually develops on all exposed areas, including the face, neck, forearms, and dorsal hands. For the first few years, the dermatitis flares in the summer, during the plant's growing sea-



FIGURE 1. *Parthenium hysterophorus* (photographed at Kew Gardens, England).

son, and disappears in the winter. However, if the condition remains untreated for several years, a persistent, pruritic, lichenified dermatitis develops.^{1,2} One example of a photocontact dermatitis due to exposure to *P hystero-phorus* has been reported.³

There is a high frequency of photosensitivity in patients with Compositae/sesquiterpene lactone (SQL) allergy, even though SQLs possess neither phototoxic nor photoallergic properties.¹ Frain-Bell and Johnson reported that 47 of 55 patients (85%) with chronic photosensitivity dermatoses had positive patch tests to Compositae.⁴

In India, more adult males are affected by *Parthenium* dermatitis than adult females or children, even though exposure is similar for all groups.¹ Early studies estimated a ratio of 20:1 between men and women.² This may be caused by the fact that Indian women have less exposed skin.² An Indian study of 45 men and 15 women with SQL allergy found that 41 of the men (91%) and 7 of the women (47%) reacted to plant material from *P hystero-phorus*.⁵ This study showed a surprisingly low rate of cross-reactivity to various Composites. Of the 60 participants, 47 (78%) reacted to *P hystero-phorus*, 25 (42%) reacted to a *Chrysanthemum* species, 11 (18%) reacted to *Dahlia pinnata*, and 4 (7%) reacted to *Tagetes indica* (marigold). Thirty-five of the participants (58%) responded to only 1 of the 4 Compositae used.

Family

P hystero-phorus belongs to the family Compositae (or Asteraceae), one of the largest families of flowering plants containing about 13,000 species, including the daisy and the sunflower.

Distribution of Plant

Although indigenous to the Americas and the Caribbean region, this aggressive weed has spread in the last 100 years to Australia, Africa, and Asia. In 1956, it was accidentally transported to Poona, India, in a consignment of US wheat.¹ In fact, the epithet

“Congress weed” is a reference to the US Congress that legislated the wheat donation.² In India, *P hystero-phorus* found an inviting ecologic niche without natural enemies and spread rapidly along canal banks, roads, and railways, developing into a major field weed.¹

Dermatitis-Inducing Plant Parts

Flowers and leaves are more potent sensitizers than stems.⁶ The mechanism by which an airborne contact dermatitis pattern occurs remains a mystery.

Nomenclature

P hystero-phorus L. has many epithets, including feverfew, wild feverfew, bastard feverfew, wild wormwood, white-top, whitehead, white broomweed, pound-cake bush, dog-flea weed, carrot weed, Congress weed, Congress grass, and the “scourge of India.” The common names *feverfew* and *wormwood* have been applied to other unrelated plant species.

Identifying Features/Plant Facts

P hystero-phorus is an annual herb with a deep taproot and an erect stem that becomes woody with age. Leaves are deeply dissected, alternate, pale green, and covered with soft fine hair (Figure 1). Flowers are creamy white and possess inner tubular florets and outer ray florets.

Allergens

Parthenin, an SQL, is considered to be the major allergen of the species. A number of other SQLs also have been isolated, including ambrosin, hymenin, coronopilin, hysterin, and tetra-neurin A. Unlike the South American *P hystero-phorus*, the Indian plant contains large amounts of the SQLs parthenin and ambrosin.¹

Treatment

Potent topical steroids and oral prednisone are relatively ineffective unless employed early (before year-round dermatitis occurs) and unless further exposure to SQLs is prevented. Azathioprine in a dose of 2 mg/kg per day may be helpful, even in protracted

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cases of dermatitis.⁷ This treatment regimen depresses both T-suppressor cells and Langerhans' cells. An Indian physician who treats many cases of *Parthenium* dermatitis uses chloroquine, 200 mg, 3 times daily for 1 week and then tapers it.⁸ He also uses 0.05 mg ethinyl estradiol in both adult men and women and tapers it after 3 weeks. He bases his use of estrogen on the fact that, in his experience, only postmenopausal women are affected by this condition. Whole body mechlorethamine (nitrogen mustard) is effective, but only temporarily, and cyclosporine works only as long as the patient continues to take it.⁹ Methotrexate and nicotinic acid are not effective in the treatment of *Parthenium* dermatitis.⁹

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