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# Phytophotodermatitis induced by wild parsnip

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## Abstract

Phytophotodermatitis results when skin is exposed to ultraviolet light after previous contact with a phototoxic compound. Wild parsnip (*Pastinaca sativa*), a member of the Umbelliferae family, is an invasive plant species introduced to North America as a root vegetable. Although cultivated less commonly today, the plant is increasingly found growing wild in prairies and roadsides. The stems and leaves contain furocoumarins, which upon activation by UV light interact with oxygen. Resultant reactive oxygen species induce tissue damage manifesting initially as blistering and later as hyperpigmentation. We report the case of a woman who developed phytophotodermatitis after encountering wild parsnip on a midwestern prairie.

**Keywords:** contact dermatitis, ultraviolet light, hyperpigmentation

## Introduction

Phytophotodermatitis is a distinctive eruption resulting from cutaneous contact with a photosensitizing compound from a plant, followed by exposure to ultraviolet light [1]. Furocoumarins in a variety of plants lead to the clinical symptoms of blistering and subsequent hyperpigmentation.

Wild parsnip (*Pastinaca sativa*) is an invasive plant species found in an increasingly expanding range in North America [2]. Recognition of phytophotodermatitis to wild parsnip is important for dermatologists given the increasing prevalence of the plant. Diagnosis can occasionally be

challenging given the delay between exposure and symptom appearance. The eruption can mimic other dermatologic conditions such as allergic contact dermatitis, bullous tinea, atopic dermatitis, cellulitis, and chemical burns [3, 4].

## Case Synopsis

A 19-year-old woman worked on a crew pulling weeds, including wild parsnip (*Pastinaca sativa*), in a sunny prairie in Iowa. Two days after exposure, linear red indurated streaks and blistering developed on her hands and arms (**Figure 1**). Eight of the twelve other field workers developed similar lesions during this time. The rash was moderately tender and only slightly pruritic. The eruption was limited to areas exposed to the weeds and sunlight, sparing the palms and areas covered by clothing. Some vesicles



**Figure 1.** Clinical photograph depicting linear erythema and bullae on sun exposed skin approximately four days after exposure to wild parsnip.

and bullae ruptured and drained clear, yellow exudate. The patient used topical hydrocortisone and occlusive wraps for symptomatic relief. After about one week, the plaques and blisters resolved, leaving hyperpigmentation. This hyperpigmentation gradually faded over the next six months.

## Case Discussion

Phytophotodermatitis is a nonimmunologic epidermal reaction to phototoxic agents exposed to UV radiation [5]. Many plants from the Umbelliferae family (including celery, wild parsnip, parsley, hogweed) and Rutaceae family (lime, lemon) contain phototoxic agents in their seeds, flowers, or stem [5]. The secondary compounds of phenylpropanoid contain linear furocoumarins (LFCs) including: psoralen, bergapten, and xanthotoxin [6]. When exposed to the UVA radiation (320-400 nm) from sunlight, the furocoumarins interact with oxygen to produce reactive oxygen species. This acutely damages cell membranes, leading to epidermal and dermal cell death, edema, and blistering [5]. Hyperpigmentation occurs via psoralen-induced changes in melanocyte size and number, increased tyrosine kinase activity, and increased melanosome density [1]. The blistering can be remedied by topical steroids or cold compresses. However, the hyperpigmentation may last for years.

Wild parsnip (*Pastinaca sativa*) is a nonnative species found throughout the United States that invades and thrives in disturbed areas, such as roadside ditches, landfills, or railway embankments [2]. It is rare to encounter this plant in well-established prairies; native plants can outcompete it with time. Wild parsnip is a monocarpic perennial herbaceous plant; it may spend multiple years in the rosette stage before blooming in favorable conditions. The plant averages six inches in the rosette stage and four feet once it forms a mature stalk with a taproot. The five to fifteen alternating leaves are egg-shaped and

spaced up the celery-like stalk (**Figure 2**). The flowers are flat-topped broad clusters that form blooms two to six inches wide from June to late summer. The plant is native to Europe and Asia and was introduced to the United States in the late 1800s to cultivate as a root vegetable [2].



**Figure 2.** Wild parsnip as found in an Iowa prairie in July. Note the bright yellow blossoms emanating from a tall central stem.

Phytophotodermatitis to wild parsnip has been rarely reported. Lutchman et al. reported a series of 11 agricultural workers who were hospitalized in 1998 after encountering the plant in Suffolk, England [7].

## Conclusion

Given the expanding range of this plant in recent decades, physicians may increasingly encounter patients with this eruption. Clinically, the linear arrangement of individual lesions may cause misdiagnosis as *Rhus*/poison oak or ivy dermatitis. However, wild parsnip-induced phytophotodermatitis is more characteristically painful rather than pruritic and is also associated with the delayed appearance of hyperpigmentation.

## References

1. McGovern, TW. Dermatoses due to plants. In: Bologna J, Jorizzo J, Schaffer J, editors. Dermatology. 3rd ed; Elsevier Limited; 2012. p. 271-275.
2. Wild Parsnip: *Pastinaca Sativa* L. Newtown Square, PA: USDA Forest Service, Northeastern Area, Forest Health Staff, 2006. [http://www.na.fs.fed.us/fhp/invasive\\_plants](http://www.na.fs.fed.us/fhp/invasive_plants). Accessed July 27, 2017.

3. Solis RR, Dotson DA, Trizna Z. Phytophotodermatitis: a sometimes difficult diagnosis. *Arch Fam Med.* 2000;(9):1195–6. [PMID:11115230].
4. Son JH, Jin H, You HS, et al. Five Cases of Phytophotodermatitis Caused by Fig Leaves and Relevant Literature Review. *Ann Dermatol.* 2017:86-90. [PMID:28223753].
5. Hankinson A, Lloyd B, Alweis R. Lime-induced phytophotodermatitis. *J Community Hosp Intern Med Perspect.* 2014 Sep 29;4(4). [PMID:25317269].
6. Stanley-Horn, D. Induction of Linear Furanocoumarins in Celery, *Apium Graveolens*, by Insect Damage and their Effects on *Lygus Lineolaris* and the Parasitoid *Persitenus Stygicus*. Order No. MQ43224 University of Guelph (Canada), 1999. Ann Arbor: ProQuest. Web. 22 July 2016. Accessed July 27, 2017.
7. Lutchman L, Inyang V, Hodgkinson D. Phytophotodermatitis associated with parsnip picking. *J Accid Emerg Med.* 1999 Nov; 16(6): 453-4. [PMID:10572825].