

Photoallergic contact dermatitis to *Heracleum giganteum*

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Summary

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Heracleum plants occur in numerous species worldwide and may cause phototoxic reactions due to its content of various furocoumarins. In this case report, a widespread photoallergic contact dermatitis after exposure to *Heracleum giganteum* (giant bear claw) is described. A photopatch test with extracts from the stem, leaves and seeds of the giant bear claw revealed a positive papulovesicular reaction that already appeared at 24 h and peaked at 72 h after irradiation with 5 J/cm² UVA. The unirradiated controls remained negative. We conclude that in rare cases *Heracleum* plants may cause severe photoallergic reactions that can be verified by photopatch testing.

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Conflicts of interest:

None declared.

Umbelliferae to which the genus of *Heracleum* plants belong are a common weed in many European countries. These plants contain various furocoumarins (psoralens) that frequently cause phototoxic reactions that are also referred to as phytophotodermatitis (1). In very rare cases, the occurrence of photoallergic reactions has been reported that may be difficult to distinguish from phototoxic reactions. We describe a case of photoallergic dermatitis after contact with *Heracleum giganteum* that was verified by photopatch testing.

Materials and methods

Case report

At the end of July, a 49-year-old woman presented at our university clinic with a generalized, highly pruritic rash. Five days before the consultation, she had been working in her garden with a machete to sever *Heracleum giganteum* plants that had been running riot. Several hours later, the patient experienced intense pruritus. This was followed by papulovesicular lesions that appeared on parts of her sun-exposed skin. She consulted the nearest hospital where she was treated with calcium tablets and dimetinden maleate gel. As the rash was getting progressively worse, the patient attended our outpatient ward. Initial examination revealed a widespread papulovesicular eruption

with irregular borders that was most pronounced on uncovered skin such as the forearms and neck. During the previous night the rash had also spread to covered parts of her body such as the abdomen and legs (Fig. 1). The patient had been exposed to *Heracleum giganteum* 1 year earlier without any skin problems. There was no history of atopic background. A patch test performed 10 years ago because of chronic hand eczema had been negative. The total IgE level was in the normal range.

Treatment was started with oral methylprednisolone 60 mg/day, which was tapered off over a 6-day period. In addition, the patient was given 2 mg dexchlorpheniramine tablets (three times daily over 5 days) and betamethasone cream twice daily. At a follow-up visit 7 days later, the patient's skin was completely cleared. A photopatch test was carried out 4 weeks after discontinuation of treatment.

Photopatch test

Minute amounts of the sap from *Heracleum giganteum* leaves, stems and seeds were gained by a prick lancet. These were applied in duplicate under occlusion by Finn chambers on the lateral aspects of the patient's upper arms. After 24 h, the Finn chambers and remnants of the sap were removed and the test areas on the left upper arm were exposed to 5 J/cm² UVA. The test substances on the right upper arm were shielded from light to serve as the



Fig. 1. The papulovesicular rash of the patient at the first consultation in our clinic.

unirradiated control. Reading was performed at 24, 48, 78 and 96 h after administration of the substances.

Results

Twenty-four hours after irradiation, a moderate maculopapular reaction to the UVA-irradiated extracts from the leaves and stems of the *Heracleum* plant was discernible. This reaction peaked at 72 h after UVA exposure when an intense erythematous papulovesicular reaction (+++) to the irradiated leaves and stems was seen (Fig. 2). The unirradiated saps did not elicit any response during the whole observation period of 96 h.

Discussion

Plants are nature's most efficient factories for producing a broad variety of chemicals. Of more than half a million known plant species, only about 12 000 have been investigated. Approximately 11 000 naturally occurring compounds have been isolated and identified.

The *Heracleum* genus belongs to the Umbelliferae family and comprises about 200 species. They can be found in many European countries, North America and Japan. *Heracleum* plants vary in their phototoxic potential depending on the amount of psoralens contained in the particular species (2). Furocoumarins, in particular, psoralens, are strong photosensitizers that commonly cause phototoxic reactions. In photochemotherapy, orally or topically administered psoralens are used in conjunction with subsequent UVA irradiation as an effective treatment modality for a broad range of skin disorders.

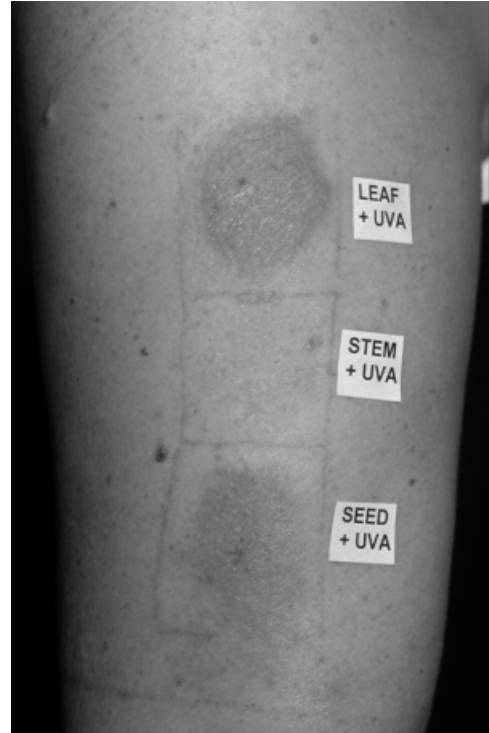


Fig. 2. Positive photopatch test at 72 h after irradiation with 5 J/cm² UVA.

Phototoxic skin reactions after topical contact with furocoumarin-containing plants are referred to as phytophotodermatitis and present as acute sunburn-like erythema and edema in an often linear or bizarre distribution reflecting the contact sites. These phototoxic reactions are non-immunologic in nature and can be elicited in all humans, provided that a sufficient concentration of the photosensitizing agent is photo-activated by an adequate dose of longwave UV (UVA) radiation.

Contrary to the common phototoxic reactions, very few reports are found in the literature on photoallergic reactions to plants or therapeutically used psoralens. Ljunggren (3) described a case similar to ours where a patient was sensitized over a period of years to parsley by garden work. Another patient with a possible photoallergic contact dermatitis to rhubarb wine has been described by Diffey et al. (2). Other authors have reported the occurrence of methoxsalen photoallergy during photochemotherapy of patients with psoriasis (4).

We assume that our patient had been sensitized to *Heracleum giganteum* during gardening 1 year earlier. The main components of this plant are the furocoumarins angelicin and bergapten. A clinical hint that a photoallergic reaction had taken place is itching as the predominant symptom (3). Other important features of a photoallergic reaction are the papulovesicular morphology and the spreading of the rash with irregular borders beyond the contact areas to non-exposed skin sites. Photopatch testing is the diagnostic mainstay to differentiate between phototoxic and photoallergic reactions although in an individual case the distinction may be difficult to make. In our patient the results of photopatch testing, the papulovesicular

morphology and the spreading of lesions beyond the application site clearly supported the clinical diagnosis of a photocontact allergy to *Heracleum giganteum*. A contact allergic reaction was ruled out by the fact that the unirradiated controls gave a negative result.

In summary, we describe a rare case of a photoallergic contact dermatitis to *Heracleum giganteum* that was characterized by a generalized, highly pruritic eczematous eruption and a positive photopatch test. Our report should alert dermatologists and allergologists to the fact that not every reaction to *Heracleum* plants necessarily is phototoxic in nature. Although a rare event, the possibility of a photoallergic reaction must be kept in mind

and has to be ruled out by a detailed history, thorough clinical examination and photopatch testing.

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