

Occupational allergic contact dermatitis caused by weeds of the Compositae, Fabaceae and Rosaceae plant families

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Phytoallergic and phytotoxic dermatitis is seen in outdoor workers, and has a seasonal appearance in late spring, summer, and early autumn. As the workers are exposed to a variety of plants, careful exposure analysis, followed by repeated patch testing, may be necessary to establish the diagnosis, as shown by this case report.

Case Report

In late 2005, a 36-year-old woodman was admitted to the Department of Dermato-Venereology, Aarhus University Hospital, with a florid facial dermatitis and skin eruption on exposed areas on the neck, arms, hands, and lower leg, following work in a meadow in summer and autumn (Fig. 1). The patient was previously healthy, except for seasonal rhinitis with known type I allergy to grass and birch, with no signs of atopic dermatitis. The skin eruption first appeared in 2003 after he had been cutting grass and plants with a brush cutter in a meadow. The dermatitis resolved when he was treated with topical and systemic corticosteroids and antibiotics. However, the rash reoccurred when he worked in the same area in the summer and autumn, but not in winter and early spring.

Initially, a polymorphic light eruption or a phototoxic reaction were suspected. Despite the use of sun block, and treatment with azathioprine followed by mycophenolate mofetil, as well as the use of relevant protective gear, the patient's condition was not satisfactorily treated. Finally, after patch testing with a series of plant specimens from the



Fig. 1. Initial presentation of severe airborne contact dermatitis.

meadow, occupational allergic contact dermatitis caused by several weeds was detected.

Phototesting with ultraviolet A and ultraviolet B irradiation gave normal findings. Urine porphyrin levels were also normal. The patient was patch tested with the European baseline series (TRUE Test; Pharmacia, Hillerød, Denmark), plant series, fragrance series, wood-tar mix, corticosteroid series, and photopatch test series (Chemotechnique Diagnostics, Vellinge, Sweden), and later tested with the constituents of fragrance mix I. Patch test readings were performed on D3 and D7, and scored according to guidelines (1). The positive and selected doubtful positive reactions are shown in Table 1. According to the patient, skin reactions were more pronounced in areas where he cut cow parsley

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Table 1. Initial screening: February 2006, Constituents of Fragrance Mix: June 2006

	Patch test	Photo patch test
Fragrance mix 6% pet.*	+	+
<i>Myroxylon pereirae</i>	–	+
<i>Chrysanthemum cinerariae</i> folium 1% pet.*	+	NT
L-Carvone 5% pet.*	+	NT
Parthenolide 0.1% pet.*	+?	NT
Tansy extract 1% pet.*	+?	NT
Isoeugenol 2% pet.†	+?	NT

NT, not tested.

*Initial screening: February 2006.

†Constituents of fragrance mix: June 2006.

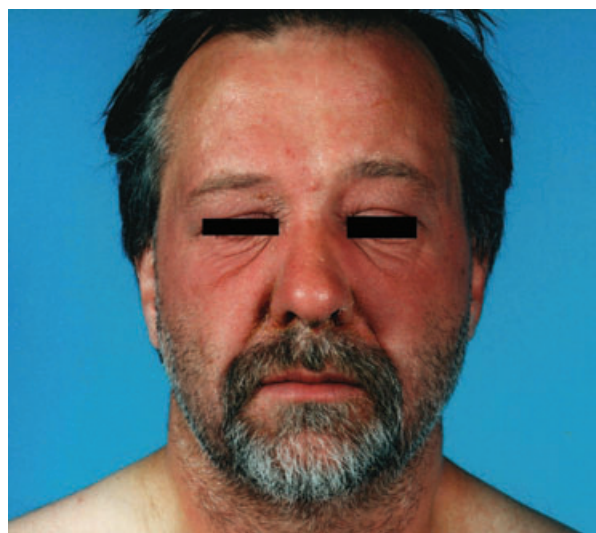
Table 2. Results of second patch testing, February 2008

	Patch test
Compositae mix 6% pet.	++
Sesquiterpene lactone mix 0.1% pet.	++
<i>Arnica montana</i> 0.5% pet.	++
<i>Tanacetum vulgare</i> 1% pet.	+
<i>Tanacetum parthenium</i> 1% pet.	++
<i>Argyranthemum frutescens</i> 3% pet.	+? (follicular)

(*Anthriscus sylvestris*), a known phototoxic plant. The initial conclusion was that the patient suffered from a phototoxic dermatitis and weak sensitization to tansy. The reaction to pyrethrum (*Chrysanthemum cinerariaefolium*) was attributed to cross-allergenicity with tansy, as this plant was not found in the area, as well as being a rare cause of contact dermatitis.

In 2008, the patient was referred for further patch testing with plant allergens at the Department of Dermatology and Allergy Centre, Odense, Denmark. The results are shown in Table 2. In the area where the patient worked, no arnica was found but there were plenty of tansies. The patient was deemed to be Compositae-allergic with several cross-reactions resulting from primary sensitization to tansy.

Despite all efforts to protect the patient from the suspected plants, he still suffered exacerbations when working in a small area of the meadow. Later in 2008, the patient contacted a local botanist and invited him to the meadow, to collect and identify specimens of the five most common plants for patch testing. Forty-eight hours after application of these five fresh plants, the patient had developed severe recall dermatitis on areas exposed earlier (Fig. 2) and reactions as shown in Table 3. Owing to the severity of the reactions, the patient was treated with prednisone at a dose of 25 mg daily. After clearing of symptoms, the patient was patch tested for 30 min with the offending plants to exclude a type I reaction; this test

**Fig. 2.** Recall dermatitis from patch testing.**Table 3.** Testing with plants 'as is' from his workplace and small ragweed from the allergen bank

	Extract	Leaf	Flower	Stem
European dewberry (<i>Rubus caesius</i>)	NT	–	NT	–
Meadowsweet (<i>Filipendula ulmaria</i>)	NT	+	+	–
Cabbage thistle (<i>Cirsium oleraceum</i>)	NT	–	–	–
Hairy vetch (<i>Vicia hirsuta</i>)	NT	++	NT	+
Ox-eye daisy (<i>Telekia speciosa</i>)	NT	+++	+++	++

NT, not tested.

gave a negative result. Seven non-Compositae-allergic volunteers were patch tested with the plant materials without developing a positive response. In conclusion, the patient had severe contact allergy to *Telekia speciosa*, *Vicia hirsuta*, and *Filipendula ulmaria*, to which he was exposed during work as a woodman.

Discussion

Plants belonging to the Asteraceae family occur both as weeds and as cultivated plants, and are characterized by their content of the allergenic sesquiterpene lactones. *T. speciosa*, which has the common name oxeye daisy or large yellow oxeye, is a member of the Compositae containing sesquiterpene lactones similar to those of the *Inula* species. It is grown in gardens, but has spread to wild areas such as meadows, and is considered to be an invasive species in Denmark (2). Paulsen et al. (3) have previously reported *T. speciosa* as a plant allergen in non-occupationally exposed patients. In this report, we show that *T. speciosa* may also be a cause of occupational dermatitis.

Sensitization to plants of the Rosaceae family is extremely rare. The Fabaceae family, on the other hand, comprises well-known sensitizers, such as balsam of Peru (*Myroxylon balsamum pereirae*), Brazilian rosewood (*Dalbergia nigra*), and pao ferro (*Macharium scleroxylon*) (4).

Vetch toxicosis in cattle (systemic granulomatous disease with pruritic dermatitis) after ingestion of *Vicia* species is well known (5), but, to the best of our knowledge, allergic contact dermatitis caused by *V. hirsuta* and *F. ulmaria* has not been described previously.

Conclusion

This case report emphasizes the importance of a careful exposure analysis when patch testing outdoor workers suspected of having allergic contact dermatitis from

plants. The commercial Compositae series, supplemented with extracts of important local Compositae sensitizers, do not always help in identifying the culprit plants. As the patient was negative to the sesquiterpene lactone mix at the initial testing, and had only weak reactions to tansy and pyrethrum, it is unlikely that large yellow oxeye was the primary sensitizer. The contact dermatitis caused by hairy vetch and meadowsweet may have paved the way for the gradually worsening Compositae sensitization. In this case, we were able to identify new allergenic plants with the help of a botanical expert. Patch testing with the selected plants as is helped us to find the plants causing occupational plant dermatitis.

In conclusion, the immortal words of Robert the Bruce, King of Scots, 'If at first you don't succeed, try, try and try again', are also relevant in patch testing.

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