

Allergic contact dermatitis from hydrangea – is it so rare?

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8 cases of allergic contact dermatitis from hydrangea seen in Angers, France, during the last 15 years are reported and compared to other cases found in the literature. In this review, allergic contact dermatitis from hydrangeas appears to be an occupational dermatosis among nursery workers, presenting as an eczema involving the hands and especially the first 3 fingers, with chronic features of fissuring and scaling and with a chronic course. Differential diagnosis from irritant contact dermatitis may be difficult. Patch tests with the stem as well as the leaf of hydrangeas gave strong positive reactions in all patients, and hydrangenol, the allergen of hydrangea, when tested, always also gave a positive reaction. Sensitization seems to occur after close and prolonged contact with the plant, which could explain the relative frequency in Angers because it provides almost 90% of hydrangea seedling production in France.

Key words: *Hydrangea macrophylla*; cultivars; hydrangenol; occupational allergic contact dermatitis; plants; nursery workers. © Munksgaard, 2000.

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Hydrangea, one of the 17 genera of the family of Hydrangeaceae, comprises 23 species found all over the world (1). Among these, the cultivars of *Hydrangea macrophylla* (Thunb). Seringe subsp. *macrophylla* are the most common and popular. They are cultivated abundantly as garden and ornamental plants. Allergic contact dermatitis from hydrangea has rarely been reported and thus seems to be rare. 11 cases have been reported (2–10) since Broers (11) published his 1st description in 1926. The 8 cases reported here have been observed during the last 15 years in Angers, France, a well-known centre for growing and cultivation of plants and flowers, especially hydrangeas.

Case Reports

All 8 patients were nursery workers (2 female, 6 male). The main clinical findings are summarized in Table 1. All patients except patient no. 7 had been exposed to hydrangeas during their work for a long time, 1 to 10 years, before the dermatitis appeared. In 4 patients, the lesions lasted 4 to 6 months, in 2 patients 1 year, and in the last 2 years before diagnosis. The dermatitis was localized on the hands and especially on the fingers, showing a

chronic course of the disease in 7 of the 8 cases. Usually, scaling and fissuring involved the pulp and sides of the thumb as well as the index and middle fingers. Only case no. 7 presented with acute contact dermatitis of the hands, with subsequent spread of the lesions to the face after a 3-day exposure to the plant. Previous sensitization was suspected, though could not be proven in this patient.

Patch tests with the leaves and stems were performed in all patients and showed strong positive reactions. Later, when hydrangenol (0.1 %, pet.) became available, provided by 1 of us (BMH), additional patch tests were performed in 4 of the patients. 2 gave a ++ reaction and 2 a +++ reaction at 3 days (D) (Table 1). Previously, patient no. 3 had been tested by 1 of us (MAA), giving a ++ reaction as well (10).

Patch tests with the European standard series (Trolab®) and a pesticides series (Trolab®) showed sensitization to nickel, colophonium and neomycin in patient no. 7 only. Type-I-allergy was demonstrated in patient no. 5 by a positive scratch test to natural rubber latex glove.

6 of the 8 patients improved when contact with hydrangeas was stopped. Patient no. 7 recovered completely and patient no. 8 had persistent fissur-

Table 1. Allergic contact dermatitis from hydrangea in Angers

Patient no.	Sex/age (years)	Occupation	Contact with hydrangeas	Localization of eczema	Clinical features	Duration	Other positive tests	Hydrangenol
1	M 43*	nurseryman	3 years	hands, fingers	chronic	4 months		NT
2	M 33*	nurseryman	several years	hands, fingertips	fissuring, scaling	8 months		NT
3	F 23 (10)	nursery worker	1 year	fingers	fissuring, scaling	6 months		++
4	M 42	nurseryman	7 years	fingers	fissuring, scaling	1 year		NT
5	M 25	nurseryman	8 years	hands	subacute	2 years	latex	++
6	M 32	nurseryman	4 years	fingers, wrists	fissuring, scaling	6 months		++
7	F 45	nursery worker	3 days	hands, eyelids	acute	3 days	nickel, colophonium, neomycin	+++
8	M 43	nursery worker	10 years	hands, fingers	fissuring, scaling	1 year		+++

* Oral communication at the 10th Cours d'actualisation en Dermatologie du GERDA, Montpellier, Oct. 1989.

Table 2. Reported cases of allergic contact dermatitis from hydrangea

Patient no.	Reference	Country	Sex/age (years)	Occupation	Localization	Clinical features	Other positive tests	Hydrangenol
1	(11)	Netherlands			face, eyes	acute	NT	NT
2	(2)	Australia	M 59	florist	hands, fingers, wrists	subacute		NT
3			F 16	florist	hands, fingers	subacute		NT
4	(3)*	Australia						NT
5	(4)	Germany	F 33	nursery worker	hands			++
6	(5)	Netherlands	M 57	nurseryman	fingers, nails	fissuring, scaling	tulipalin A	++
7	(7)	Netherlands	M 25	nurseryman	hands	fissuring, scaling		+++
8			F 46	amateur flower arranger	hands±face	acute	Myroxylon Pereirae fragrance mix, PTBPF resin nickel	+++
9	(8)	Netherlands	F 25	nursery worker (daughter of patient no. 5 above)	fingers, nails			NT*
10	(9)	Netherlands	M 28	gardener	hands, fingertips	fissuring, scaling	colophonium, kalanchoe leaf	++

* 1 case among 26 patients allergic to plants.

** Patient refused any further testing.

ing and scaling of his fingers 3 months after avoiding contact with the plant.

Discussion

10 other cases of allergic contact dermatitis due to hydrangea have previously been reported in (2–9, 11) (Table 2). The 1st patient reported by Broers (11) was not patch tested, and in the cases of Apted (2), Burry (3) and Bruynzeel (8), only a positive patch test reaction to the leaf or stem of the plant was obtained. In Bruynzeel's (8) 2nd case, a test with hydrangenol could not be performed as the patient refused any further patch testing. To date, hydrangenol has thus been tested in 5 patients reported in the literature and in 5 of the nursery workers presented in this paper. Patch tests with

the leaves and stems were always positive when done. In the published cases, reactions to tulipalin A (5) and to kalanchoe (9) were also described. Reactions to allergens of other origin were also seen in our patient nos. 5 and 7 (Table 2).

Except for the 2nd case of Meijer et al. (7), who

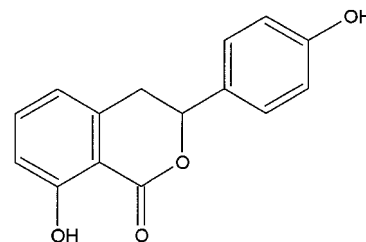


Fig. 1. Chemical structure of hydrangenol.

was an amateur flower arranger, and the case without details of Burry (3), all previously reported individuals had all also frequently been exposed to hydrangeas at their workplace as nursery worker, florist or gardener. Acute contact dermatitis was observed only in our patient no. 7. In all other cases, the dermatitis ran a subacute or chronic course, with scaling and fissuring of the pulps and sides of the thumb, index and middle fingers. A remarkable resemblance to the "tulip fingers" of Dutch nursery workers was evident.

The allergen of *Hydrangea macrophylla* subsp. *macrophylla* was isolated from common cultivars by Hausen (4) in 1982. Elucidation of its still unknown configuration and final confirmation of its structure by X-ray crystallography was reported by Schmalte et al. (12). The constituent proved to be 3,4-dihydro-8-hydroxy-3-(4-hydroxyphenyl)-isocoumarin. This compound had already been isolated in 1930 by Asahina & Asano (13), and named hydrangenol (Fig. 1), but its strong sensitizing properties remained unknown until 1991, when this was proven experimentally in guinea pigs (14). Hydrangenol is easily obtained from the leaves, stems and petals by extraction with diethyl ether. It occurs in various species of *Hydrangea*, though could not be detected in all samples investigated. In cultivars of *Hydrangea macrophylla* subsp. *macrophylla*, its concentration seldom exceeds 3% (14). Related species commonly yield less than 2% (15). A patch test concentration of 0.1% has been recommended (14). The isocoumarin hydrangenol is the only sensitizer known so far in *Hydrangea* species. Allergenic properties of other *Hydrangea* constituents, such as umbelliferone, kaempferol, hydrangea acid, phyllo-dulcin and lunularic acid, have not been described.

As listed in Table 2, only a few cases of allergic contact dermatitis due to hydrangea have been published between 1926 and 1992. A further case was observed by 1 of us (BMH) in 1998, but remained unpublished (gardener, flower shop owner, hand dermatitis, hydrangenol: +++ reaction at D3). Our 8 cases in Angers are the only ones reported from France. The province of Anjou, with its centre Angers, is a well-known region for horticulture in the west of France. Growing and cultivation of hydrangeas takes place in 2 steps: 1st the production of seedlings, which requires close and frequent contact with the plants. In the 2nd step necessary for obtaining the flowers, called "forcing", the plants are grown under glass and contact with the plants is less frequent. The city of Angers provides almost 90% of hydrangea seedling production in France. From here, raised seedlings are dispatched to various other nurseries in many cit-

ies of France and other places in Europe, where forcing is completed. This probably explains the high frequency of contact hypersensitivity to hydrangea in our region, as seedling production requires closer and more prolonged contact with the plants than forcing. We believe that many more cases do occur, but they are either not recognized or are misdiagnosed as an irritant contact dermatitis because of the scaling and fissuring of the fingers. Only patch tests with parts of the plant or with hydrangenol itself will finally help to clear occupationally-induced cases.

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