

Allergic contact dermatitis from *Dittrichia viscosa* (L.) Greuter

MARGARIDA GONÇALO AND SAUDADE GONÇALO

Clinica de Dermatologia, Hospital da Universidade, 3000 Coimbra, Portugal

9 cases of contact sensitivity to *Dittrichia viscosa*, mainly with an airborne pattern, are described. All patients reacted to the fresh leaf of the plant and to its ethereal extracts at 1 and 0.5% pet., and some of them also to that at 0.1% pet. Positive reactions to *Frullania dilatata*, *Laurus nobilis*, some other members of the Compositae, and helenin were observed, suggesting the diagnosis of a sesquiterpene-lactone-induced allergic contact dermatitis.

Key words: allergic contact dermatitis; occupational; *Dittrichia viscosa*; *Inula viscosa*; *Frullania*; Compositae; sesquiterpene lactones; plants; airborne contact dermatitis.

Accepted for publication 21 July 1990



Dittrichia viscosa (sticky elecampane) is an aromatic Mediterranean weed (Figs. 1, 2), occasionally used as a folk medicine (1). Widely scattered in Portugal, it grows along roads and tracks and in uncultivated fields. Its lanceolate leaves and stems are covered with fine glandular hairs: trichomes (2) (Figs. 3, 4).

The plant, a member of the Compositae family previously known as *Inula viscosa* Aiton (2), has occasionally been reported as a cause of allergic contact dermatitis (1, 3, 4). We report a study of 9 patients with contact sensitivity to this plant.

Figs. 1 and 2. *Dittrichia viscosa*.



Fig. 5. Patch test with the ethereal extract of *D. viscosa* at 0.1% pet. (Case no. 1).

0.5%, but 3 failed to react at 0.1% (Table 2).

50 controls tested with the extracts at 1% were negative. Among 25 tested with the leaf as is, we found 2 positive results (+), with negative reactions to the extracts; 1 patient had an allergic contact dermatitis from *Frullania* and the other to perfumes (oak moss) and *Frullania*.

All of the 8 patients patch tested with *Frullania dilatata* had a positive test: 7 of 8 reacted to helenin. Other positive reactions are detailed in Table 2.

Discussion

Contact sensitivity to *D. viscosa* was seen in 9 patients. 3 reported acute dermatitis of the hands, forearms and legs after coming into contact with weeds. This clinical pattern is observed in contact dermatitis from wild vegetation, especially with *Anthemis cotula* (6), though lichenified dermatitis, observed in 2 patients, is considered more common (7, 8). Spread of dermatitis to take up an airborne pattern is also a common feature of Compositae dermatitis (3, 7), as with *Parthenium hysterophorus* (5, 9). 1 patient had erythema-multi-forme-like lesions, occasionally reported in allergic contact dermatitis from strong allergens of plants and woods (10) and terpenes (11).

The allergen of *D. viscosa* is contained in

Table 2. Patch test results

Patch tests	Case	1	2	3	4	5	6	7 ¹	8	9
<i>D. viscosa</i> as is		+++	+++	+++	++	++	++	+++	++	++
<i>D. viscosa</i> 1%		+++	+++	++	++	NT	++	++	++	+
<i>D. viscosa</i> 0.5%		+++	+++	++	++	NT	+	+	+	+
<i>D. viscosa</i> 0.1%		++	+++	++	+	NT	—	+	—	—
<i>F. dilatata</i>		++	++	++	+++	NT	++	+++	+++	++
<i>L. nobilis</i>		NT	++	+	NT	NT	—	++	NT	NT
<i>C. myconis</i> ²		—	—	++	—	NT	—	—	—	++
<i>C. hortorum</i> ³		—	—	++	—	NT	—	+	—	NT
<i>Conyza bonariensis</i> ⁴		—	++	++	—	NT	+	—	—	NT
Helenin 1%		—	++	++	++	+	++	++	+++	NT
Arnica tinet.		—	—	++	—	NT	—	—	NT	NT
Laurel oil		NT	++	++	NT	NT	NT	—	—	NT
Pyrethrum		NT	—	—	—	NT	—	++	—	NT
B. Peru		—	—	++	—	++	—	—	—	+
Colophony		++	—	++	—	—	—	++	—	—
Perfume-mix		++	—	++	+	++	—	++	+	+++

¹ This patient had a ++ patch test with the trichomoes of *D. viscosa*.

² *Chrysanthemum myconis* is now known as *Coleostephus myconis* Reichb. f. (synonyms *Chrysanthemum myconis* L. and *Myconia myconis* Briq.).

³ *Chrysanthemum hortorum* is probably *Dendranthema* cv. indet.

⁴ *Conyza bonariensis* (L.) Cronq.

the leaves and in its glandular trichomes, as has been demonstrated by Rodríguez et al. for *Parthenium hysterophorus* (5, 7), and by Hausen for *Helianthus annuus* (12). Also, 1 of our patients reacted to the trichomes of *D. viscosa*. They are easily detached from the plant: we collected fragments of them on a glass slide after whipping up the stems and leaves of the plant in our laboratory. The airborne pattern of dermatitis could therefore have arisen from contact with detached plant fragments carried on the wind.

The main allergens of *D. viscosa* are sesquiterpene lactones. In 1987, Piñedo et al. (1) isolated 3 fractions from its ethereal extracts; 2 of them gave a color reaction with a sesquiterpene lactone reagent and were positive when patch tested at 0.1% pet.

D. viscosa contains neither alantolactone nor isoalantolactone (1), the main sensitizing lactones of the genus *Inula* (1, 8). However, only 1 of our patients (Case no. 1) failed to react to helenin.

In 1977, Bohlmann et al. (13) isolated 2 different sesquiterpene lactones from *D. viscosa*, namely 2-deacetoxyxanthinin and inuviscolide (Fig. 6), but neither human nor animal studies have been performed with them to confirm their sensitizing capacity.

We observed multiple positive reactions to sesquiterpene lactones with different structural skeletons, or to the plants in which they occur: (i) *xanthanolide* (2-deacetoxyxanthinin) and (ii) *guaianolide* (inuviscolide), which we presume were present in our sample of *D. viscosa* (13);

(iii) *eudesmanolide* as alantolactone and those usually isolated from *Frullania* (8); (iv) *pseudoguaianolide* as helenalin from Arnica tincture (8, 14), and (v) *germacranolide* as those from *Laurus nobilis* (laurenbiolide and costunolide) (8, 15) and pyrethrum (pyrethrosin) (8). Studies conducted in man have shown multiple simultaneous positive reactions to sesquiterpene lactones with different structures (16, 17), but they occur more frequently within the same or similar groups (14, 16).

Positive patch tests to *Frullania*, *Laurus nobilis* and other Compositae, frequently reported (3, 8, 15, 18–23), are due to cross-reaction (15–16, 20, 21, 24, 25) and to multiple concomitant sensitization to different sesquiterpene lactones (17). This explains the frequent recurrences of allergic contact dermatitis induced by different plants containing sesquiterpene lactones (15, 19, 20, 26), as in our patients. Moreover, as they are widely scattered in Portugal: *Frullania* spp. (18), *D. viscosa*, *Chrysanthemum myconis*, *Conyza bonariensis*, etc., rural patients cannot avoid them all, and, for those who become highly sensitive, life in the countryside may become extremely difficult.

In 8 of our 9 cases, dermatitis from *D. viscosa* was occupational, as it frequently is in both Compositae and *Frullania* dermatitis (9, 14, 18).

Acknowledgements

We are thankful to Professor Jorge Paiva from the Botanical Faculty of the University of Coimbra, for the identification and classification of plants.

References

1. Piñedo J M, De Canales F G, Hinojosa J L, Llamas P, Hausen B M. Contact dermatitis to sesquiterpene lactones in *Inula viscosa* Aiton. *Contact Dermatitis* 1987; 17: 322–323.
2. Valdés B et al. Flora de Andalucía Occidental. Barcelona; Ketres, 1987; vol. 3, p. 17.
3. Pecegueiro M, Brandão F M. Airborne contact

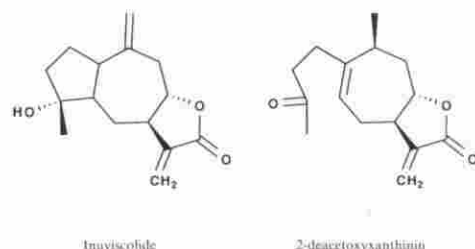


Fig. 6. Sesquiterpene lactones isolated from *D. viscosa* by Bohlmann et al. (13).

- dermatitis to plants. *Contact Dermatitis* 1985; 13: 277-279.
4. Sertoli A, Fabbri P, Campolmi P, Panconesi E. Allergic contact dermatitis to *Salvia Officinalis*, *Inula Viscosa* and *Conyza Bonariensis*. *Contact Dermatitis* 1978; 4: 314-315.
 5. Hausen B M. A simple method for extracting crude sesquiterpene lactones from Compositae plants for skin tests, chemical investigations and sensitizing experiments in guinea pigs. *Contact Dermatitis* 1977; 3: 58-60.
 6. Menz J, Winkelmann R K. Sensitivity to wild vegetation. *Contact Dermatitis* 1987; 16: 169-173.
 7. Arlette J, Mitchell J C. Compositae dermatitis. Current aspects. *Contact Dermatitis* 1981; 7: 129-136.
 8. Benezra C, Ducombs G, Sell Y, Fousereau J. *Plant contact dermatitis*. Toronto: Decker Inc., 1985: 105-149.
 9. Schmidt R J. Compositae. In: Guin J D and Beaman J (eds.): *Plant dermatitis. Clinics in Dermatology* 1986; 4: 46-61.
 10. Cronin E. *Contact dermatitis*. London: Churchill Livingstone, 1980: 29.
 11. Kirby J D, Darley C R. Erythema multiforme associated with a contact dermatitis to terpenes. *Contact Dermatitis* 1978; 4: 238.
 12. Hausen B M, Spring O. Sunflower allergy. On the constituent's of the trichomes of *Helianthus annuus* L. (Compositae). *Contact Dermatitis* 1989; 20: 326-334.
 13. Böhlmann F, Czersou H, Schoneweiß S. Neue Inhaltsstoffe aus *Inula viscosa* Ait. *Chem Ber* 1977; 110: 1330-1334, cited in Piñedo J M, De Canales F G, Hiuojosa J L, Llamas P, Hausen B M. Contact dermatitis to sesquiterpene lactones in *Inula viscosa* Aiton. *Contact Dermatitis* 1987; 17: 322-323.
 14. Hausen B M, Herrmann H D, Willuhn G. The sensitizing capacity of Compositae plants (I). Occupational contact dermatitis from *Arnica longifolia* Eaton. *Contact Dermatitis* 1978; 4: 3-10.
 15. Fousereau J, Muller J C, Benezra C. Contact allergy to *frullania* and *Laurus nobilis*: cross-sensitization and chemical structure of the allergens. *Contact Dermatitis* 1975; 1: 223-230.
 16. Epstein W L, Reynolds G W, Rodriguez E. Sesquiterpene lactone dermatitis. Cross-sensitivity in *Costus*-sensitized patients. *Arch Dermatol* 1980; 116: 59-60.
 17. Benezra C, Epstein W L. Molecular recognition patterns of sesquiterpene lactones in *costus*-sensitive patients. *Contact Dermatitis* 1986; 15: 223-230.
 18. Gonçalo S. Contact sensitivity to lichens and compositae in *Frullania* dermatitis. *Contact Dermatitis* 1987; 16: 84-86.
 19. Corres L F, Torres J L C. Dermatitis from *frullania*, *Compositae* and other plants. *Contact Dermatitis* 1987; 4: 175-176.
 20. Corres L F. Contact dermatitis from *frullania*, *compositae* and other plants. *Contact Dermatitis* 1984; 11: 74-79.
 21. Hausen B M. The sensitizing capacity of Compositae plants (III). Test results and cross-reactions in Compositae-sensitive patients. *Dermatologica* 1979; 159: 1-11.
 22. Larrègue M, Rat J-P, Gallet P, Bressieux J-M, Poussel, Eczéma de contact au pissenlit, à l'huile de laurier noble et au *frullania* par allergie croisée. *Ann Dermatol Venerol* 1978; 105: 547-548.
 23. Schmidt R J, Kingston T. Chrysanthemum dermatitis in South Wales; diagnosis by patch testing with feverfew (*Tanacetum parthenium*) extract. *Contact Dermatitis* 1985; 13: 120-127.
 24. Stampf J, Schlewer G, Ducombs G, Fousereau J, Benezra C. Allergic contact dermatitis due to sesquiterpene lactones. A comparative study of human and animal sensitivity to α -methylene- γ -butyrolactone and derivatives. *Brit J Dermatol* 1978; 99: 163-169.
 25. Schaeffer M, Talaga P, Stampf J, Benezra C. Cross-reaction in allergic contact dermatitis from α -methylene- γ -butyrolactones: importance of the cis or trans ring junction. *Contact Dermatitis* 1990; 22: 32-36.
 26. Hausen B M. Wild and cultivated plants causing contact dermatitis (abst.). *Excerpta Medica* 1989; 13: 290.

Address:

Saúdade Gonçalo
Clínica de Dermatologia
Hospitais da Universidade de Coimbra
3000 Coimbra
Portugal

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.