

PLANT DERMATITIS IN THE SOUTHERN TRANSVAAL*

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Plant dermatitis due to contact with sensitizing or irritating plants often presents a characteristic clinical appearance which is familiar to dermatologists but frequently puzzling to other practitioners. As the condition can be persistent and disabling, recognition of the clinical picture and subsequent identification of the offending plant is rewarding to the patient and physician. Doctors should be aware of the common sensitizing plants in the botanical area in which they practise.

Plant dermatitis may produce erythema, swelling, papular or vesicular eczema, and even urticarial lesions, and may be localized or widespread. The lesions are usually worst on exposed areas, but may occur on covered areas due to carriage of the sensitizer by the fingers, direct spread of persorbable antigen such as pollen under the clothing, or systemic dissemination. Typical lesions have a streaked, linear, blotchy, papular or clumped appearance (Fig. 1) occurring in random fashion and causing a rash which

Plant dermatitis is usually seasonal when due to an outdoor species, unless it is an evergreen, but certain hothouse and pot plants may produce dermatitis all the year round. Phytodermatitis is an occupational hazard for nurserymen, florists and woodworkers, but virtually anybody of any age may be affected at one time or another.

Most plants have to be broken or crushed to release the allergen or irritant, but some, like the primula, can sensitize from intact foliage. Plant sensitizers are commonly present in the oleoresin fraction of the sap, but a few occur in water-soluble fractions. They are classified as secondary products and do not enter directly into the active metabolism of the plant.²

In order to get some idea of the frequency and causes of plant dermatitis in the Southern Transvaal, recent cases have been reviewed.

CASES AND CAUSES

During the 27-month period of the survey, starting in July 1968, a total of 4 538 new patients were seen in a private dermatological practice in Johannesburg, of which 26 were cases of proved and suspected plant dermatitis, giving an over-all incidence of 0.57%. Excluding the 2 suspected cases, 24 proved cases were on file, representing 0.53% of all patients seen.

The patients with phytodermatitis in this series were all White. However, it is known that the Bantu may be affected,³ although dark-skinned people appear to be less susceptible.⁴ They were questioned about other allergies, and were regarded as having atopy if they had suffered from any one of the atopic conditions at some time during

TABLE I. 24 CASES OF PROVED PLANT DERMATITIS

Plant	Cases seen	Age range in years	Male	Female	Atopy	Additional cases
<i>Smodingium argutum</i>	11	5 - 49	8	3	5	33
<i>Rhus succadanea</i>	3	13 - 40	0	3	0	1
<i>Rhus radicans</i>	1	29	1	0	0	2
<i>Hedera</i> species	3	26 - 38	2	1	2	0
<i>Chrysanthemum</i> species	2	14 - 60	0	2	1	0
<i>Primula mallacoides</i>	2	60 - 67	2	0	0	0
<i>Monstera deliciosa</i>	1	26	0	1	0	0
Iroko wood	1	40	1	0	1	0
Totals	24	5 - 67	14	10	9	36

TABLE II. PATIENT'S OWN DIAGNOSIS

Diagnosis	No.
Plant dermatitis	8
Insect bites, caterpillars, sandworm	5
No idea	4
Food allergy	3
House paint	1
DDT spray	1
Brucella antigen contact dermatitis	1
Drinking of bird-bath water	1

24

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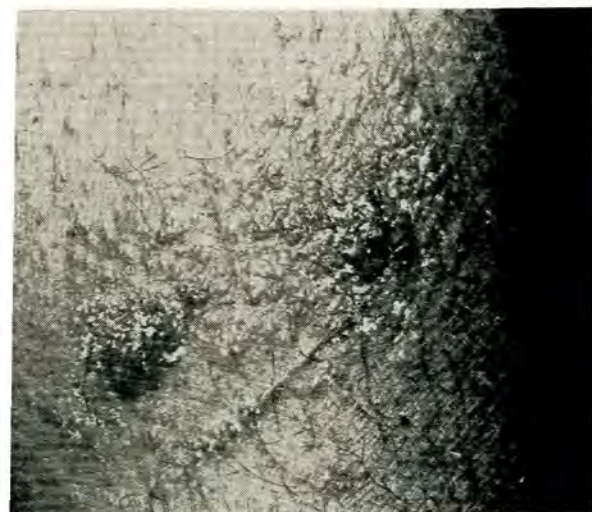


Fig. 1. Clumped and streaked blisters on the forearm in a case of smodingium dermatitis.

is often asymmetrical. However, a more uniform and widespread erythema and swelling sometimes occurs on the exposed areas of face, neck and hands due to repeated contact with flowers or leaves or to exposure to pollen or volatile substances. In milder cases of this nature only periorbital erythema and oedema may be seen. Non-specific patterns of plant dermatitis occur in a proportion of cases which might present with fissured, scaly or vesicular hand eczema, flexural eczema, urticarial eruptions and other lesions. Some plants contain photosensitizers and the resulting dermatitis only occurs following sun-exposure, and postinflammatory pigmentation is common. Other plants cause dermatitis by mechanical or chemical irritation, or by mixtures of both. Pseudophytodermatitis may be produced by mites, caterpillars, dyes, waxes or insecticides present on the surface of the plant.

their lives. Additional affected relatives or friends reported by these cases were also recorded. The causes, numbers of patients seen, age, sex, and atopic state of the 24 proved cases, and the numbers of other cases reported by them, are detailed in Table I. The patients' own diagnoses were often misleading, and for interest's sake are set out in Table II. Table III shows the source of the plant contact in these cases.

TABLE III. SOURCE OF CONTACT

Source	No.
Own garden	16
Friend's garden	3
Flower arranging	2
Own flat or house	1
School	1
Occupational	1
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	24
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Anacardiaceae

Members of this family caused 15 cases of plant dermatitis, forming by far the largest group in the series. Potentially poisonous species of the family Anacardiaceae throughout the world include the American poison ivy, poison oak, certain sumacs, the mango tree, the cashew-nut tree, the Japanese lacquer tree, the Indian marking-nut tree, and in South Africa the *Smodingium argutum*. The resin canals of these plants contain a milky sap which turns black on exposure to air. The sap is present in the roots, stems, leaves, flowers, berries and seeds, and is only released if the resin canals are broken open by actual damage to the plant.⁵ The oleoresin fraction of the sap is often termed urushiol and its antigenic properties, which are retained long after the plant is dead, are related to the presence of pentadecylcatechols. The sap adheres tenaciously to skin, hair, animal fur, clothing, garden implements, furniture, toys, tennis-rackets and so on, and with its persistent sensitizing potential it may remain a source of renewed dermatitis long after the offending plant has been destroyed. As these plants are deciduous the majority of the cases in this series occurred in the warmer months, but 4 patients were affected in winter from pruning plant stems in their gardens.

A point of interest, but not relevant to this series, is that the self-melanizing sap of certain species of Anacardiaceae found elsewhere in the world is used commercially in various inks, varnishes and lacquers and constitutes a further source of contact dermatitis.⁶

Smodingium argutum. Sometimes called the rainbow leaf,⁷ this plant is popular in parks and gardens by virtue of its striking multicoloured foliage present in autumn before the leaves fall. As far as is known this is the only member of the family Anacardiaceae indigenous to South Africa which causes dermatitis.⁸ It is only found in South Africa and its predominant natural habitat is in the Eastern Cape and Natal. Readily available at many nurseries, it is now quite common in Southern Transvaal gardens, and may be found growing as a shrub, creeper or tree. The leaves are recognizable by their trifoliate pattern and dentate margins (Fig. 2).

Smodingium dermatitis was seen in 11 patients in this series, being almost half of the proved cases. The dermatitis was usually very severe, with streaky papulation, oedema and blistering, patchy urticarial whealing and sometimes a generalized dissemination of the eczema. The course varied from 1 to 4 weeks, most cases taking about 3 weeks to clear. Several of the patients had had repeated attacks, and one of these was a 13-year-old schoolboy who mentioned an epidemic of similar cases at his school. It was established later that a total of 31 out of 90 children at the school were affected by smodingium dermatitis, including one whole class of 16 pupils. The offending bush was found in the middle of the playground, and the epidemic ceased after its removal and incineration. Another 3 cases of smodingium dermatitis were reported in friends or relatives of 2 other patients in the series. It would appear that the *Smodingium argutum* has the same marked ability to sensitize as the American poison ivy. For this reason, smodingium patch-tests should be avoided where possible. Patch-tests done on 6 suspect cases in the series were strongly positive, although the patients were advised to remove the patches at the first sign of a reaction in order to restrict its severity.



Fig. 2. The trifoliate leaf of *Smodingium argutum* with its dentate margins.

The smodingium oleoresin has not been analysed as yet, but cross-sensitivity reactions in patients in this series indicate that it is antigenically similar to the American poison ivy oleoresin which is known to contain a 1,2-dihydroxy benzene (catechol) with a 15-atom side-chain in the third position.⁵ Three patients with prior dermatitis from American poison ivy readily developed a smodingium dermatitis. One of these, an American by birth, had just arrived in this country and developed the dermatitis within 48 hours of touching a smodingium bush for the first and only time. Another patient with a known smodingium sensitivity showed a strong reaction to a patch test with a leaf from a *Rhus succadanea*, one of the sumacs known to cause dermatitis of the poison ivy type.

Rhus succadanea. This is a small tree with spreading branches which grows 6 - 12 ft high, and is considered to be one of the most beautiful of the sumacs.⁸ Its dependent compound leaves which are composed of smooth, narrow leaflets 2 - 4 in long (Fig. 3), turn from green to a brilliant yellow colour in the autumn. It is known as the wax tree and originates from China and Japan, and the Japanese make candles from the wax of its fruit. It is freely available at nurseries and is a common sight in Johannesburg gardens.



Fig. 3. The compound leaf of *Rhus succadanea* is composed of a variable number of smooth, narrow leaflets.

Three cases of dermatitis due to this plant were seen, and another case was reported affecting a cousin of one of the patients. The dermatitis was of a milder nature than that seen with smodgingium, and the plant would appear to be a less potent sensitizer.

Rhus radicans. This is the true American poison ivy, and its importation into South Africa is prohibited. Some garden enthusiasts, however, have been brought into the country, presumably for its bright autumnal colours. It usually grows as a woody vine and carries its leaflets in groups of three.

One case was seen with a persistent poison ivy dermatitis of the most severe type, which required 12 corticosteroid tablets daily for control. Traces of a blackish substance were still evident on this patient's arms when first seen. He developed the rash after pruning 2 large creepers covering the walls of his house. He stated that both his children and his dog were affected to a mild degree. One previous outbreak of poison ivy dermatitis has been described in a village not far from Johannesburg.⁹

Araliaceae

Members of the hederia species, the common evergreen ivies, abound in gardens in Johannesburg and the Witwatersrand. These creepers are popular owing to their attractive leaves which vary in shape and colour. The leaves and berries contain a glucoside, hederin, and are poisonous if eaten. These ivies are quite unrelated to the American poison ivy, although they occasionally cause dermatitis of a similar type. The varieties previously described in this connection, both with plain or variegated

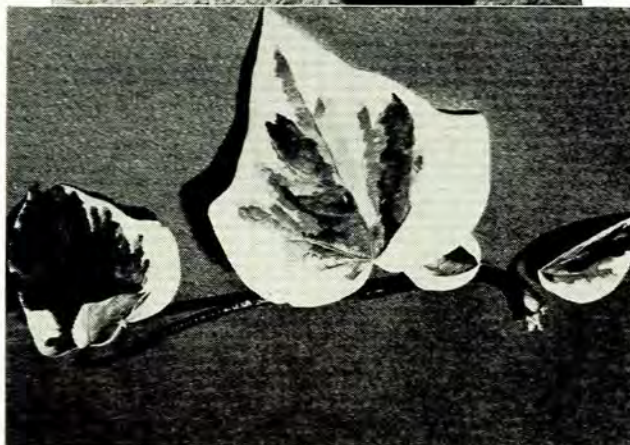


Fig. 4. Above: The 5-pointed leaf of *Hedera helix*. Below: The 3-pointed leaves of *Hedera canariensis*.

leaves, are *Hedera helix*, the English ivy,³⁰ which has 5-pointed leaves, and *H. canariensis* or Algerian ivy³¹ with 3 points to its leaves (Fig. 4). The sensitizing sap is present in the leaves, stems and roots which only release it if they are damaged or broken.

Three patients were seen in this series, 2 of whom had really severe dermatitis. The rash was contracted after pruning back the creeper or forcibly brushing against its leaves. Patch-tests for *H. helix* and *H. canariensis* were positive in all cases, and the one case so tested was also positive to *H. helix pedata*, the birdsfoot ivy, so it seems likely that the various hederas species cross-react. The sensitizing potential of the hederas must be low, for though the creepers are common the dermatitis is rare.

Compositae

Chrysanthemum and other daisy species are well-known causes of plant dermatitis. Chrysanthemum dermatitis used to be seasonal, as garden plants flower in autumn and early winter, but nowadays hothouse varieties are available throughout the year. Different species of daisies may be in flower virtually the whole year round. Florists and horticulturists are at particular risk from these plants as prolonged contact is usually required to set off a dermatitis. The common varieties of chrysanthemum are *C. indicum* and *C. sinense*, and asters and daisies are members of the same family,³² and so may cross-sensitize. As the sensitizer is present in resin canals in the pollen as well as in the stem the dermatitis may be widespread over the exposed face, neck and arms in addition to the hands. The possible allergens are pyrethrins I and II which are present in the oleoresin,³³ and to which cases of chrysanthemum dermatitis may cross-react.



Fig. 5. *Primula mallacoides* in bloom.

Two cases of mild chrysanthemum dermatitis were seen in this series. An elderly lady had got blistered hands for nearly 40 years from handling cut chrysanthemums, and a 14-year-old girl had acquired patchy dermatitis of the face after taking part in a flower-arranging competition.

Primulaceae

Primula dermatitis is relatively uncommon in South Africa, as the most dangerous species, *Primula obconica*, does not enjoy the same popularity here as it does in Europe. Primin, its sensitizer which readily penetrates intact skin, is found in and on the small glandular hairs on the undersurface of its leaves and on the stem. The structural formula of this substance is 2-methoxy-6-n-pentyl-p-benzoquinone, and synthetic primin has been used for patch-testing,³⁴ but primin may not necessarily cross-react with other species of primula.^{1,15} *Primula obconica* is on sale as a pot plant in nurseries in the Southern Transvaal in spring and summer, and colleagues have seen cases of dermatitis caused by it. The most abundant variety of primula here which is seen flowering in many parks and gardens in winter and early spring is the *Primula mallacoides* (Fig. 5). This is considered by some to be a rare cause of dermatitis, but others doubt its ability to sensitize.

Two cases of dermatitis due to *P. mallacoides* were seen in elderly patients in late winter. One had an area of vesicular dermatitis on the leg, and the other had a diffuse erythema and oedema of the face, neck and hands acquired from the 64 primulas in his greenhouse, and a patch-test caused such swelling and irritation of his arm that he was unable to sleep for 2 nights.

Araceae

Various members of the arum family (Araceae) are known to cause dermatitis. The microscopic needle crystals or raphides of calcium oxalate in their leaves, stems and underground organs may penetrate mucosal or skin surfaces if the plant is crushed, and cause severe primary irritation.³⁶ The latex and oleoresins from their leaves and stems may cause dermatitis on skin contact which is usually due to primary irritation, but in the case of philodendron at least is an allergic reaction³⁷ to a toxic principle which is apparently water-soluble and lying within the leaf.³⁸ Cases of dermatitis due to *Philodendron scandens* have been reported in dermatological journals³⁷⁻³⁹ and other causes of dermatitis among the Araceae include the dieffenbachia or dumb cane and the *Monstera deliciosa* or delicious monster.^{20,21} These 3 species are popular indoor ornamentals which are evergreen and might cause dermatitis the whole year round if handled, watered or cleaned. They are to be found in many houses, flats, offices, foyers and shops throughout Johannesburg and the Witwatersrand.

One young housewife with a recurrent periorbital irritation, swelling and erythema had negative patch-tests to all her cosmetics and to various other substances. Her clinical appearance and history were very similar to those of the first described case of philodendron dermatitis in whom only the eyelids were affected.³⁹ She lived in a flat and her dermatitis always improved when she was away on holiday. A patch-test with a piece of crushed and moistened leaf from the *Monstera deliciosa* in her lounge

iced a mildly positive reaction, and her dermatitis resolved a gradual and fluctuating resolution after removal of the plant.

As

various woods used in South Africa can cause dermatitis and these include imbuia, iroko, pine²² and tamboetie. A case of occupational dermatitis of the hands and arms due to contact with wood shavings was seen. The cause was *Chlorophora excelsa*, one of the Moraceae, commonly known as iroko wood or mvuli.

Other Causes

Many additional sensitizing plants are listed in other series or are known to colleagues and botanists here. Other possible causes of dermatitis in Southern Transvaal include buttercups, cinerarias, cosmos, daffodils, gerberias (including poinsettia), gaillardia, goldenrod, oleander, and pelargoniums, hyacinth and tulips, and acacias, eucalyptus, pepper and pine trees. Other hazards worth a mention are citrus peel, figs, pineapples, tomatoes, asparagus, carrots, celery, garlic, mustard and onions. An additional indoor ornamental evergreen capable of causing dermatitis is the sansevieria, or mother-in-law's tongue. Phytophotodermatitis has many causes, of which celery, figs, parsley and St John's wort (hypericum) constitute a few. Mechanical irritation from spines or thorns as found on acacias, cactus plants and pyracantha could be a problem. Plants causing urticaria such as the bush stinging-nettle may be encountered in bushveld in Southern Transvaal.

Two patients with seasonal rashes of the face suggestive of contact dermatitis were seen in this series, but no definite causes were found.

MANAGEMENT

General Diagnosis

Conditions seen in the survey period which could be confused with plant dermatitis included dermatitis artefacta, dermatitis herpetiformis, dermatographism and jelly-stings, constitutional eczema, contact dermatitis from cosmetics, cosmetics and vapours, photosensitivity, seborrhoeic dermatitis and urticaria.

Treatment

Mild cases usually responded to shake lotions, dilute corticosteroid creams and oral antihistaminics. Severe cases often required oral or even parenteral corticosteroids, sometimes in high dosage, and maintenance therapy was necessary for 2-4 weeks. Local corticosteroids were found to be relatively ineffective in severe contact dermatitis, confirming the experience of others,⁴ and a shake lotion consisting of menthol 0.5% and phenol 2% in a saline solution was more effective than any other single remedy tried. Persistently severe dermatitis was helped by frequent tepid baths in an attempt to cool the skin and by removal of the sticky oleoresin, and also by avoidance of plants and animals contaminated by the resin.

CONCLUSIONS

This series is too small for definite conclusions to be drawn. However, it can be noted that approximately 1 in 200 cases seen in a dermatological practice in the Southern Transvaal were derived from plant dermatitis. Only a third of these

patients suspected a plant cause, although two-thirds encountered the plant in their own gardens. About two-thirds contracted dermatitis from deciduous members of the family Anacardiaceae and although three-quarters of them were affected in summer, the remainder occurred out of season from winter pruning. Almost half of all cases were due to *Smodingium argutum*, an indigenous South African plant. Thirty-three other cases of smodingium dermatitis in relatives, friends or fellow scholars were reported by these patients, underlining the considerable sensitizing potential of this plant. Cross-reactions between smodingium, *Rhus radicans* and *Rhus succadanea* indicate that their oleoresins contain a similar antigenic component. One-third of all patients mentioned having had one of the manifestations of atopy at one time or another, but this may not differ significantly from such incidence in the normal population in the Southern Transvaal region.

SUMMARY

Twenty-six cases of plant dermatitis seen over a 27-month period in a Johannesburg dermatological practice are reviewed. The majority were caused by one of the Anacardiaceae whose sap produced a severe dermatitis of the American poison ivy type. Most of these cases were due to the *Smodingium argutum*, the only species of this family indigenous to South Africa known to cause eczema, and the remainder were caused by *Rhus succadanea* and *Rhus radicans*. Cross-reactions found in certain patients indicated the antigenic similarity of the oleoresins of these 3 plants. The remaining proved cases in the series were due to hederia species, *Primula mallacoides*, chrysanthemums, *Monstera deliciosa* and iroko wood. The cause of seasonal attacks of presumed plant dermatitis in 2 patients was not found. Clinical aspects of plant dermatitis and its causes, differential diagnosis and treatment are discussed.

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