PLANT DERMATITIS IN THE SOUTHERN TRANSVAAL*

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During the 27-month period of the survey, starting in July 1968, a total of 4538 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, although dark-skinned people appear to be less susceptible. They were questioned about other allergies, and were regarded as having atopy if they had suffered from any of the atopic conditions at some time during the 7-year period of the survey.

Additional Male Female Atopy cases

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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.

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

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### TABLE I. 24 CASES OF PROVED PLANT DERMATITIS

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

### TABLE II. PATIENT'S OWN DIAGNOSIS

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant dermatitis</td>
<td>8</td>
</tr>
<tr>
<td>Insect bites, caterpillars, sandworm</td>
<td>5</td>
</tr>
<tr>
<td>No idea</td>
<td>4</td>
</tr>
<tr>
<td>Food allergy</td>
<td>3</td>
</tr>
<tr>
<td>House paint</td>
<td>1</td>
</tr>
<tr>
<td>DDT spray</td>
<td>1</td>
</tr>
<tr>
<td>Brucella antigen contact dermatitis</td>
<td>1</td>
</tr>
<tr>
<td>Drinking of bird-bath water</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Source</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own garden</td>
<td>16</td>
</tr>
<tr>
<td>Friend's garden</td>
<td>3</td>
</tr>
<tr>
<td>Flower arranging</td>
<td>2</td>
</tr>
<tr>
<td>Own flat or house</td>
<td>1</td>
</tr>
<tr>
<td>School</td>
<td>1</td>
</tr>
<tr>
<td>Occupational</td>
<td>1</td>
</tr>
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</table>

### 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. 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 decidious 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.

**Smodingium argutum.** Sometimes called the rainbow leaf, 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. 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.](image-url)
**Rhus succedanea.** This is a small tree with spreading hedges which grows 6 - 12 ft high, and is considered to be of the most beautiful of the sumacs. Its dependent roud leaves which are composed of smooth, narrow leaflets 2-4 in long (Fig. 3), turn from green to a brilliant colour in the autumn. It is known as the wax tree and is native from China and Japan, and the Japanese make waxes from the wax of its fruit. It is freely available at nurseries and is a common sight in Johannesburg.

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

**Rhus radicans.** This is the true American poison ivy, and importation into South Africa is prohibited. Some men, however, have been brought into the country by enthusiasts, presumably for its bright autumnal colour. 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.

**Araliaceae**

Members of the Hedera 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, hedrin, 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 leaves, are:

*Hedera helix.*

*Hedera canariensis.*

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**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, which has 5-pointed leaves, and *H. canariensis* or Algerian ivy 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, 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, and to which cases of chrysanthemum dermatitis may cross-react.

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, but primin may not necessarily cross-react with other species of primula. *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 malacoides* (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. malacoides* 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. 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 reaction to a toxic principle which is apparently water-soluble and lying within the leaf. Cases of dermatitis due to *Philodendron scandens* have been reported in dermatological journals and other causes of dermatitis among the Araceae include the dieffenbachia or dumb cane and the *Monstera deliciosa* or delicious monster. 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 peri-orbital 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. 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

![Fig. 5. Primula malacoides in bloom.](image-url)
seed a mildly positive reaction, and her dermatitis ed a gradual and fluctuating resolution after removal e plant.

As rious woods used in South Africa can cause dermati- and these include imbuia, iroko, pine and tamboetie. case of occupational dermatitis of the hands and rms due to contact with wood shavings was seen. cause was Chlorophora excelsa, one of the Moraceae, nonly known as iroko wood or mvuli.

eleanous Causes

any additional sensitizing plants are listed in other tries or are known to colleagues and botanists here. ser possible causes of dermatitis in Southern Transvaal ns include buttercups, cinerarias, cosmos, daffodils, orbias (including poinsettia), gaillardia, goldenrod, ssae, oleander, and pelargoniums, hyacinth and tulip s, and acacias, eucalyptus, pepper and pine trees. en hazards worth a mention are citrus peel, figs, pine-, tomatoes, asparagus, carrots, celery, garlic, mustard onions. An additional indoor ornamental evergreen ble of causing dermatitis is the sansevieria, or mother-w's tongue. Phytophotodermatitis has many causes, of h celery, figs, parsley and St John's wort (hypericum) 1 constitute a few. Mechanical irritation from spines thorns as found on acacias, cactus plants and pyra- na could be a problem. Plants causing urticaria such se bush stinging-nettle may be encountered in bush ps in Southern Transvaal veld.

o patients with seasonal rashes of the face suggestive ant dermatitis were seen in this series, but no definite es were found.

MANAGEMENT

entral Diagnosis

nditions seen in the survey period which could be used with plant dermatitis included dermatitis arte- t, dermatitis herpetiformis, dermographism and jelly- stings, constitutional eczema, contact dermatitis from sols, cosmetics and vapours, photosensitivity, sebor- ic dermatitis and urticaria.

entrée

ild cases usually responded to shake lotions, dilute corticosteroid creams and oral antihistaminics.

vere cases often required oral or even parenteral corticosteroids, sometimes in high dosage, and maintenance therapy was necessary for 2-4 weeks. Local corti- roids were needed to be relatively ineffective in severe t dermatitis, confirming the experience of others, and se lotion consisting of menthol 0.5% and phenol 2% alamine lotion was more effective than any other single remedy tried. Persistently severe dermatitis was helped frequent tepid baths in an attempt to cool the skin and t removal of the sticky oleoresin, and also by avoidance bjects and animals contaminated by the resin.

CONCLUSIONS

series is too small for definite conclusions to be drawn. ever, it can be noted that approximately 1 in 200 cases in a dermatological practice in the Southern Transvaal red from plant dermatitis. Only a third of these patients suspected a plant cause, although two-thirds en countered 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 smod- gium, Rhus radicans and Rhus succardana 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 succardana and Rhus radicans. Cross-reactions found in certain patients indicated the antigenic similarity of the oleo­ resins of these 3 plants. The remaining proved cases in the series were due to hedera species, Primula malacloides, chry- santhemums, Monsera delicosa 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.

I am grateful to a number of people for their assistance in tracing toxic plants and gathering information for this paper, but must mention Dr B. de Winter, Deputy Director, Botanical Research Institute, Pretoria, Mrs Mayda de Winter, and M. J. Wells, Senior Professional Officer, Botanical Research Institute, Pretoria, to whom special thanks are due for their invaluable help and guidance which was available at all times.

REFERENCES