

# Clinical Patterns of Phytodermatitis

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## KEYWORDS

- Allergic contact dermatitis • Irritant contact dermatitis
- Phytodermatitis • Phytophotodermatitis • Botanic extracts

Cutaneous exposure to plants occurs mostly through outdoor activity. Campers, hikers, forestry workers, farmers, and gardeners at times develop skin eruptions from close interaction with the vegetal kingdom. Plants are also present indoors and can adversely affect homemakers, housekeepers, florists, cooks, and grocery store workers. Botanic extracts and plant derivatives are ubiquitous and found in a wide range of products, from foods to building materials, and from fragrances to topical and oral medicaments.

Most published textbook reviews describe phytodermatitis from a pathophysiologic or botanic perspective.<sup>1-3</sup> The present article puts the emphasis on the clinical presentation of cutaneous reactions to plants, highlighting some classic and less common patterns of dermatitis.

## POISON IVY DERMATITIS

Members of the family Anacardiaceae, 5 species of the genus *Toxicodendron* are widely distributed across the North American continent.<sup>4</sup> The 2 species of poison oak have different ranges, *T. diversilobum* being found along the Pacific coast, whereas *T. toxicarium* inhabits the south-eastern United States. Poison ivy is represented by 2 species: *T. rydbergii*, which grows in the northern and midwestern United States and Canada as a low-lying shrub, and *T. radicans*, a climbing vine found all along the eastern coast of the United States. All 4 species have pinnate (compound) leaves divided in 3 leaflets. Those of poison oak are deeply notched, such as oak leaves, while poison ivy leaflets are spoon-shaped (Fig. 1). The habitat of *T. vernix*, or poison sumac, is restricted to the eastern United States and

Canada. A tree that grows in marshy areas, it bears 7 to 13 smooth-edged, lanceolate leaflets on a long central petiole.

When bruised, all parts of the plant exude a sticky, strongly allergenic oleoresin, called urushiol. It could theoretically sensitize 70% of individuals who come in contact with it, and up to 50% of North Americans are presumably already sensitized.<sup>5,6</sup> The allergens are penta- or heptadecylcatechols, benzene rings that bear hydroxyl groups at position 1 and 2, and aliphatic side chains at position 3. The length of the side chain and the number of its double bonds determine the allergenicity of the molecule.<sup>7,8</sup>

Once an individual is sensitized, repeated contact will elicit cutaneous lesions within 12 to 48 hours. The reaction is an acute eczema that begins with pruritic, edematous, erythematous papules and urticarial-looking plaques that rapidly become studded with vesicles and tense bullae. Lesions appear where the plant has brushed against the skin, typically on the legs, thighs, hands, and upper limbs. They classically display a linear morphology of crisscrossing streaks (Fig. 2). The sticky sap can be transferred from the fingers to more distant sites, such as the face, trunk, and genitals. It may at times produce a bizarre-shaped, severely edematous and vesicular perianal and genital eczema in the unfortunate hiker who used a handful of poison ivy leaves instead of toilet paper.

New lesions will continue to erupt for 1 to 2 weeks. It is not rare for insufficiently treated episodes to last 4 to 8 weeks, or to flare up after short courses of systemic corticosteroids. In subsequent episodes, lesions tend to become

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**Fig. 1.** *Toxicodendron rydbergii* (poison ivy) showing the three leaflets of its pinnate leaves.

more severe, and they tend to appear after a shorter interval following exposure.

Depending on the type of exposure, the classic, streaky pattern may be blurred or unrecognizable. This may occur with weed-wacker dermatitis.<sup>9</sup> The victim, often clad in shorts, trims weeds with a rotating trimmer that projects a puree of vegetal particles. The resulting dermatitis is a diffuse papulovesicular eruption that involves the exposed front half of the body and is more severe on the shins. Exposure to smoke from burning poison ivy plants results in an airborne pattern of dermatitis that spares covered areas. Lesions do not follow a specific pattern when the dermatitis is acquired by proxy, such as after handling contaminated garments or tools, or petting a dog that went cavorting in poison ivy.

### SESQUITERPENE LACTONE DERMATITIS

The Asteraceae, or Compositae, family is the second largest of the vegetal kingdom. It comprises edible plants, such as lettuce, sunflower, tarragon, and artichoke; weeds like dandelion, ragweed, and thistle; and ornamental plants whose names cover the entire alphabet,



**Fig. 2.** Poison ivy dermatitis with linear distribution of papules and vesicles.

from aster to zinnia. Chrysanthemums, chamomile, coneflowers, dahlias, daisies, and black-eyed Susans, all belong to this family. Most of these plants bear small, tubular flowers densely packed on a flowering disk, or capitulum. The florets of the outer row are often ligulated, displaying rays of fused petals (**Fig. 3**).

Asteraceae produce chemicals known as sesquiterpene lactones (SLs), 15-carbon molecules made of a sesquiterpene linked to a lactone ring.<sup>10</sup> Approximately 750 of these molecules could theoretically sensitize, and allergenicity is increased by the presence of an  $\alpha$ -methylene group attached to the lactone ring.<sup>11</sup> SLs are present in fresh plants, pollen, and in particles from dried plants.<sup>12</sup>

Classically, SL-induced dermatitis affects men more than women, and is rare in childhood. Outdoor workers, such as farmers and gardeners, have a higher risk for sensitization, but florists, nursery workers, and cooks have also been affected. Sensitization occurs through direct and airborne skin contact. Subacute eczematous lesions initially involve the face, the neck, and the exposed areas of the upper limbs. The dermatitis is seen in the growing season of the plants and abates during the winter. With repeated yearly exposure, however, the disease-free interval gets progressively shorter, and a chronic, severely pruritic, and extremely lichenified dermatitis becomes perennial. On the face, massive lichenification gives rise to a leonine facies reminiscent of cutaneous lymphoma or actinic reticuloid. This pattern of involvement simulates photodermatitis, but in many patients, true photosensitivity eventually supervenes and progresses to severe chronic actinic dermatosis or full-blown erythroderma. SLs are not phototoxic or photoallergic, and the cause

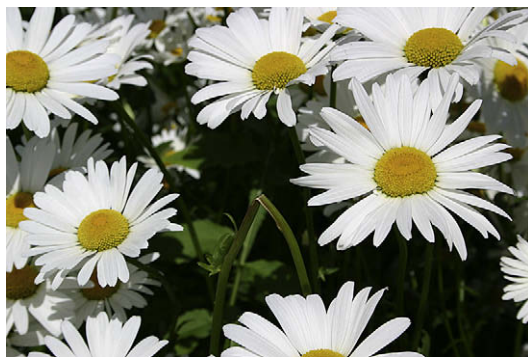


**Fig. 3.** *Leucanthemum vulgare* (oxeye daisy). Hundreds of tiny yellow florets are clustered on a flowering disk. The peripheral flowers bear white rays made of three fused petals.

of SL-associated photosensitivity therefore remains elusive.<sup>13</sup>

Asteraceae are not the only plants that produce SLs. They are also found in magnolias and laurels, and in liverworts, or bryophytes, moss-like organisms that grow on the bark of trees. *Frullania dilatata* and *F. tamarisci*, of the family Jubulaceae, have been identified as the cause of “cedar poisoning,” an occupational dermatitis of forest workers.<sup>14</sup> It is clinically indistinguishable from Asteraceae dermatitis, except that it flares during the wet winter months of the Pacific northwest logging season.<sup>15</sup>

### PRIMULA DERMATITIS

Among the 500 varieties of primroses, *Primula obconica* is a winter-flowering indoor plant that is still quite popular in Europe. It possesses broad and hairy leaves, and small goblet flowers that must be deadheaded to stimulate continuous blooming. Primin, or 2-methoxy-6-pentylbenzoquinone, is the main allergen, and its concentration in the plant is highest between the months of April and August.<sup>16</sup>

The dermatitis involves the fingertips, the dorsum of the fingers, and hands, sometimes the forearms. It presents as edematous papules and irregular or linear papulovesicular plaques. The eyelids, face, and neck may become secondarily affected by hand-borne transfer of the allergen.

Primin-free cultivars are now available and widely distributed. The beginning of the 2000s has seen a steady decline in the detection rate of primin allergy in Europe.<sup>17,18</sup> Contact dermatitis to primrose has always been rare in North America, and a study by Mowad<sup>19</sup> yielded only one positive reaction out of 567 consecutively tested patients.

### PHYTOPHOTODERMATITIS

Some families of plants contain psoralens or furocoumarins that trigger a phototoxic eruption when activated by exposure to ultraviolet A light after contact with the skin. This reaction is not immunologically mediated, and it affects anyone under appropriate circumstances. The plant chemicals loosely bind to DNA but, when photoexcited, become covalently bound to pyrimidine bases on DNA strands, leading to cell death.

Phytophotodermatitis is most often caused by contact with plants of the Apiaceae, or Umbelliferae, family. They include weeds and edible plants, such as hogweed, cowbane, carrot, parsnip, dill, fennel, celery, and anise. Their common botanic characteristic is their inflorescence known as an umbel, an umbrella-like cluster of long stalks radiating

from a central point (**Fig. 4**). Psoralens are also present in Rutaceae, a family that comprises shrubs and trees of the genus *Citrus*, the gas plant (*Dictamnus albus*), and rue (*Ruta graveolens*), an herb often used as a condiment. Amongst phototoxic Moraceae and Fabaceae are found, respectively, the fig tree (*Ficus carica*) and babchi (*Psoralea cordifolia*), from which psoralens were named.

The typical pattern of phytophotodermatitis is meadow-grass dermatitis, also known as dermatitis bullosa striata pratensis of Oppenheim. Lesions will appear within 8 to 24 hours of exposure to the sap of a psoralen-containing plant followed by sun exposure. Accompanied by a burning sensation, erythematous, irregular patches and streaks appear on areas that were exposed to both plant and light. Vesicles and large blisters may be present, but pruritus is not a major feature of the eruption, as opposed to allergic phytodermatitis. As the lesions heal, they are replaced by deeply pigmented macules that slowly fade in the course of weeks to months.

The juice of lime or other citrus fruits may flow around the mouth, spill over the hands, or drip on the body of vacationers lying around swimming pools, producing bizarre blotches and trickle-shaped streaks of pigmentation (**Fig. 5**). Contact with the cut ends of psoralen-containing celery caused an epidemic of phytophotodermatitis affecting the forearms of grocery store workers.<sup>20</sup>

### TULIP FINGERS

Originating from central Asia, *Tulipa gesneriana* was introduced in Holland in the 16th century.<sup>21</sup> There are now more than 2500 modern tulip cultivars in the family Liliaceae, propagated by their onion-like bulbs. Growers and sorters handle



**Fig. 4.** *Foeniculum vulgare* (fennel). This lateral view shows the umbrella-shaped umbel bearing secondary umbellules.



**Fig. 5.** Pigmentary stage of phytophotodermatitis caused by lime juice that trickled on the skin, producing a pattern reminiscent of berloque dermatitis.

them repeatedly, as they peel off dead tecta (outer skin) and bulblets from the main bulb. They often develop a severely fissured, hyperkeratotic dermatitis, at times accompanied by painful paronychia, involving the pulp of the first 3 fingers (**Fig. 6**).<sup>22</sup>

The allergen is tulipalin A, or  $\alpha$ -methylene- $\gamma$ -butyrolactone, an SL that does not cross-react with the SLs of the Asteraceae. It is hydrolyzed from tuliposide A, a glycoside present in all parts of the plant but more concentrated in the bulb. The same allergen also occurs in the stem, leaves, and petals of the Peruvian lily, *Alstroemeria aurantiaca*, a showy, trumpet-shaped flower with striped inner petals, which has become very popular in



**Fig. 6.** Tulip fingers. Painful, fissured, and hyperkeratotic dermatitis of the pulp of the first 3 fingers.

flower arrangements (**Fig. 7**). Sensitized florists who handle the plant and cut leaves along the stem develop a pattern of dermatitis similar to tulip fingers.<sup>23</sup> The dermatitis, however, often extends to the entire volar surface of the second finger of the hand that holds the paring knife (**Fig. 8**).

Cooks who slice garlic bulbs occasionally develop an allergic contact dermatitis that mimics tulip fingers. The lesions are often unilateral, limited to the nondominant fingers that hold the clove that is being sliced with the other hand. The allergen in this case is diallyl disulfide, a molecule unrelated to SLs.

#### LESS COMMON PATTERNS OF PHYTODERMATITIS *Other Anacardiaceae and Ginkgoaceae*

Mangoes, fruits of *Mangifera indica*, contain urushiol in their exocarp (outer skin). A mild to severe perioral dermatitis can occur when a sensitized individual bites into an unpeeled mango<sup>24</sup> (**Fig. 9**). Approximately 80% of Japanese cabinet-makers exposed to the varnish extracted from the lacquer tree, *Toxicodendron verniciflua*, develop a dermatitis that involves the hands and forearms.<sup>25</sup> Repeated low-grade exposure, however, induces some degree of tolerance, and the majority of lacquer workers can continue to ply their trade. Laundrymen in India, called *dhobis*, mark their customers' clothes with an urushiol-containing black oleoresin extracted from the nut of *Semecarpus anacardium*. The ink is unaffected by boiling and has caused numerous cases of "dhobi itch," allergic dermatitis at the site of contact, usually the nape of the neck<sup>26</sup> or around the waist. The closely related Brazilian cashew nut tree, *Anacardium occidentale*, bears reddish fruits that contain the kidney-shaped nut within a three-layered pericarp. The middle layer is filled with brownish oil rich in cardol and anacardic acid, chemically similar to urushiol. These



**Fig. 7.** *Alstroemeria aurantiaca* (Peruvian lily) displaying its striped inner petals.



**Fig. 8.** Hand dermatitis in a florist sensitized to *Alstroemeria*.

catechols are destroyed when the nut is properly roasted and processed, but harvesters have developed occupational dermatitis from exposure to the oil. Cashew oil is also used in the production of phenolformaldehyde resins, varnishes, inks, and brake linings. Exposed workers can become sensitized and develop eczematous lesions on exposed parts of the body.<sup>6</sup>

Although unrelated to the Anacardiaceae, the *Ginkgo biloba* tree is also a source of urushiol-like catechols. The tree is dioecious, that is, divided into male and female individuals. The allergenic ginkgolic acid is present exclusively in the flesh of the drupe-like ovule. In 1963, an epidemic of allergic contact dermatitis affected 35 schoolgirls who presented with eczematous lesions on legs that had been splattered with the juice of trampled ovules.<sup>27</sup> Urban planners who use the ginkgo as ornamental tree along streets and avenues now recommend planting male specimens only.

### Airborne Contact Dermatitis

The pattern of airborne contact dermatitis may be confused with photodermatitis, because both



**Fig. 9.** Subacute perioral dermatitis in a poison ivy-sensitive patient, caused by biting into an unpeeled mango.

involve exposed areas. But photodermatitis spares the upper eyelids and the submental and retroauricular regions, which are areas that are affected by an airborne allergen or irritant.

The disease may be acute, with severe edema and blisters, as when a sensitized individual is exposed to the smoke of burning poison ivy, or chronic and lichenified from contact with SLs of windblown ragweed pollen or trichomes and dried particles of *Parthenium hysterophorus*, also known as “congress grass” or “the scourge of India.” This plant, indigenous in the southern United States, was accidentally introduced in India in the 1950s and has rapidly spread throughout its country of adoption, sensitizing thousands in the rural population.

Sawmill workers, carpenters, cabinetmakers, and floor layers often work with indigenous and exotic woods from tropical areas. Pine, fir, and spruce softwood exudes a sticky resin from which are extracted turpentine and its solid residue, colophony, also known as rosin. These compounds are natural mixes of various terpenes, some of which are strong allergens in their oxidized form. Many tropical species contain allergenic quinones that are potent sensitizers (**Table 1**). Fine sawdust floating in the air sticks to the face and other exposed areas, giving rise to a true airborne contact dermatitis (**Fig. 10**). In addition, it infiltrates clothes and gets deposited in moist folds, hence the frequent involvement of antecubital fossae, axillae, waistline, and genitals.

### Irritant Contact Dermatitis

*Dieffenbachias* and *Philodendrons* are tropical species of the Araceae family, grown as indoor plants for their shiny decorative foliage. Their sap is rich in needle-like calcium oxalate crystals, or raphides, that penetrate the skin and cause burning erythema, blisters, and, at times, necrosis on parts of the body, usually the hands and forearms, that come in contact with broken leaves or stems. Small children may chew the leaves and develop a severe stomatitis accompanied by abundant sialorrhea and aphonia, hence the name “dumb cane” given to some species of *Dieffenbachia*.<sup>28</sup>

The century plant, *Agave americana* or *tequilana*, of the Agavaceae family, is widely cultivated in Mexico. This succulent plant develops, almost at ground level, thick, broad, serrated, and sword-like leaves arranged in a rosette pattern.<sup>29</sup> Its sap contains not only inulin, which is hydrolyzed and fermented to produce mescal and tequila, but also various saponins and calcium oxalate raphides. Machete-wielding workers chop the leaves

**Table 1**  
Some indigenous and tropical trees that cause allergic dermatitis

| Family                                         | Taxon                                                                                                                                                                                                             | Vernacular Name                                                                                                                | Allergens                                                                                                                                                                                                                                                                                 |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Anacardiaceae,<br>Ginkgoaceae,<br>Magnoliaceae | <i>Anacardium occidentale</i><br><i>Mangifera indica</i><br><i>Schinus terebinthifolius</i><br><i>Lithraea molleoides</i><br><i>Ginkgo biloba</i><br><i>Magnolia</i> spp                                          | Cashew nut tree<br>Mango tree<br>Brazilian pepper tree<br>Liter<br>Ginkgo<br>Magnolia                                          | Various heptadecylcatechols and<br>pentadecylcatechols, cardol,<br>anacardic acid, etc                                                                                                                                                                                                    |
| Bignoniaceae                                   | <i>Tabebuia avellanedae</i>                                                                                                                                                                                       | Lapacho, ipe                                                                                                                   | Deoxylapachol<br>Lapachenole<br>Lapachol                                                                                                                                                                                                                                                  |
| Cupressaceae                                   | <i>Thuja plicata</i>                                                                                                                                                                                              | Canadian red cedar, redwood                                                                                                    | B-thujaplicin<br>Thymoquinone                                                                                                                                                                                                                                                             |
| Fabaceae                                       | <i>Dalbergia nigra</i><br><i>Dalbergia latifolia</i><br><i>Dalbergia melanoxylon</i><br><br><i>Dalbergia retusa</i><br><br><i>Dalbergia cearensis</i><br><i>Machaerium scleroxylon</i><br><i>Bowdichia nitida</i> | Brazilian rosewood<br>Indian rosewood<br>African blackwood<br><br>Cocobolo<br><br>Kingwood<br>Jacaranda, pao ferro<br>Sucupira | R-4-methoxydalbergione<br>R-4-methoxydalbergione<br>S-4-methoxydalbergione<br>S-4-OH-4-methoxydalbergione<br>S-4'-OH-4-methoxydalbergione<br>R-4-methoxydalbergione<br>Obtusaquinone<br>Unspecified dalbergione<br>R-3,4-dimethoxydalbergione<br>2,6-Dimethoxybenzoquinone<br>Bowdichione |
| Meliaceae                                      | <i>Khaya anthotheca</i><br><i>Swietenia macrophylla</i>                                                                                                                                                           | African mahogany<br>American mahogany                                                                                          | Anthothecol                                                                                                                                                                                                                                                                               |
| Moraceae                                       | <i>Chlorophora excelsa</i>                                                                                                                                                                                        | Iroko                                                                                                                          | Chlorophorin                                                                                                                                                                                                                                                                              |
| Pinaceae                                       | <i>Abies balsamea</i><br><i>Picea glauca</i><br><i>Pinus resinosa</i><br><i>Pseudotsuga menziesii</i><br><i>Tsuga Canadensis</i>                                                                                  | Balsam fir<br>White spruce<br>Red pine<br>Douglas fir<br>Eastern hemlock                                                       | Colophony, a natural mix that includes:<br>D <sup>3</sup> -carene hydroperoxides, abietic acid,<br>dehydroabietic acid, dihydroabietic<br>acid, pimaric acid, etc.                                                                                                                        |
| Sterculaceae                                   | <i>Mansonia altissima</i>                                                                                                                                                                                         | Bete                                                                                                                           | Mansonon A                                                                                                                                                                                                                                                                                |
| Verbenaceae                                    | <i>Tectona grandis</i>                                                                                                                                                                                            | Teak                                                                                                                           | Deoxylapachol<br>Lapachol                                                                                                                                                                                                                                                                 |

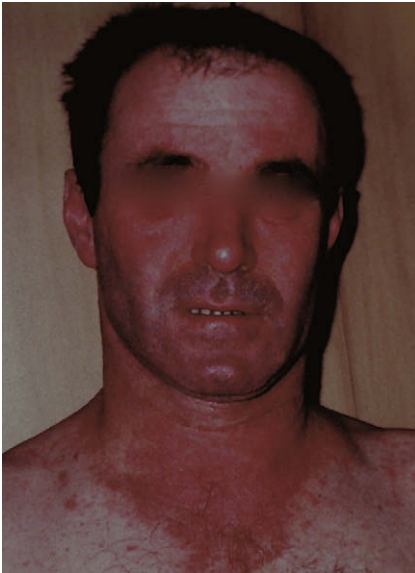


**Fig. 10.** Airborne allergic contact dermatitis in a woodworker.

to harvest the core of the plant. Sap is projected on exposed legs, hands, forearms, and face, quickly eliciting a burning sensation and a dermatitis referred to as “mal de agaveros.”<sup>30</sup>

Calcium oxalate and possibly various alkaloids also play a role in the induction of occupational dermatitis in growers and handlers of daffodils and hyacinths. These perennial, bulbous, early-blooming plants belong, respectively, to the Amaryllidaceae (*Narcissus pseudonarcissus*) and Liliaceae (*Hyacinthus orientalis*) families. “Daffodil itch,” or “lily rash,” affects up to 50% of flower cutters whose hands and forearms come in contact with the sap.<sup>21</sup> Secondary involvement of the face and genital region occurs by transfer of the sap from contaminated hands. The dermatitis is usually mild but at times becomes chronic or generalized. Hyacinth bulbs contain up to 6% by weight calcium oxalate crystals. The outer skin of these bulbs is brittle and easily breaks down into dust or tiny sharp scales that become airborne and release raphides when deposited on the skin. Nearly all bulb handlers experience pruritus or dermatitis, known as “hyacinth itch” or “bulb scabies.” Involved areas include the inner forearms, the face, thighs, anogenital region, and other areas where clothes rub on the skin.<sup>21</sup>

The so-called “sabra dermatitis” is another scabies-like condition, caused by mechanical rather than chemical irritation. It occurs in harvesters of prickly pears, the edible fruits of the cactus *Opuntia ficus-indica*. The dermatitis was first described in Israel and presents as an

itchy, papular eruption of the hands, fingers, wrists, chest, buttocks, and genitals.<sup>31</sup> It is secondary to cutaneous implantation of fragments of fine bristles known as glochids.

### **Erythema Multiforme**

Severe allergic contact dermatitis often becomes prone to autoeczematization and gives rise to disseminated lesions, distributed well beyond the initial site of contact. At times, these lesions display a concentric, target-shaped morphology. These targets are often atypical, being arciform or incomplete, lacking the dusky center of true erythema multiforme (EM). Histopathologic examination either reveals the characteristic interface dermatitis of EM or a spongiotic dermatitis, in which case the eruption is better called “EM-like.”<sup>32</sup>

Allergens of plant origin are most often responsible for such eruptions. They include *Toxicodendron spp.*,<sup>33</sup> numerous exotic woods, such as Brazilian rosewood, cocobolo, pao ferro, and so on; *Primula obconica*; plants of the Asteraceae family; and tea tree oil, extracted from the Australian tree *Melaleuca alternifolia*.<sup>34,35</sup>

### **Dermatitis from Plant Extracts and Botanicals**

Plant extracts and products based on plant derivatives are ubiquitous in daily life and include gums, balsams, adhesives, textiles, wooden objects, paper, foods and spices, perfumes, cosmetics, and topical medicaments. Of the 65 allergens or mixes tested by the North American Contact Dermatitis Group in its standard series, 9 are of plant origin: colophony, some components of the fragrance mix I (cinnamic alcohol, cinnamal, eugenol, isoeugenol, and oak moss absolute) and of the fragrance mix II (coumarin, citronellol, and farnesol), *Myroxylon pereirae* (balsam of Peru), SL mix and Compositae mix, propolis, tea tree oil, and ylang-ylang. It is beyond the scope of this article to describe every pattern of reaction caused by contact with these plant derivatives, but some are worthy of mention.

Phytophotodermatitis caused by psoralen-containing perfumes is known as berloque dermatitis. This pattern is rarely seen nowadays, because most manufacturers have removed from their formulations the phototoxic bergapten, present in the oil of the bitter orange bergamot (*Citrus aurantiaca*). Women who sunbathed after applying these perfumes, such as the older version of Shalimar by Guerlain, developed pigmented, curvilinear, pendant-like streaks on the sides of the neck, the inner wrists and arms, back of hands, and so on.

Massage therapy has become popular in recent years. Practitioners use a wide variety of fragrant essential oils, believed to possess stress relieving or other medicinal properties. Numerous therapists have become sensitized to lavender, eucalyptus, ylang-ylang, sandalwood, or jasmine and suffer from occupational hand eczema involving mostly the palms and the volar aspect of the fingers.

Botanic extracts are increasingly added to cosmetic and therapeutic preparations and, not surprisingly, the incidence of allergic contact dermatitis to these compounds has risen. Kiken and Cohen<sup>36</sup> published an extensive review of herbal extracts reported to cause contact allergy. *Arnica montana*, or mountain tobacco, an SL-producing member of the Asteraceae family, is probably the most common offender.<sup>37</sup> It is often used as a tincture or ointment for the treatment of sprains, bruises, and other musculoskeletal ailments. Belonging to the same family, Roman chamomile, *Anthemis nobilis*, and its slightly less allergenic German counterpart, *Matricaria chamomilla*, are often brewed as herbal tea, and the decoction is used as soothing compresses for burns and other skin irritations or infections. Both have been reported to cause allergic contact dermatitis.<sup>38,39</sup> In recent years, tea tree oil has seen its popularity increase as a cure-all for psoriasis, acne, eczema, and warts, and numerous reports of allergic contact dermatitis have been published.<sup>35,40,41</sup> Other allergenic extracts include lavender oil (*Lavandula angustifolia*), peppermint oil (*Mentha piperita*), Asiatic pennywort (*Centella asiatica*), rosemary (*Rosmarinus officinalis*), sage (*Salvia officinalis*), witch hazel (*Hamamelis virginiana*), and cucumber (*Cucumis spp.*).<sup>36</sup>

The principle behind homeopathy is to fight evil with infinitesimal dilutions of evil. Manufacturers of homeopathic remedies have marketed phytotherapeutic preparations containing toxicodendron extracts, as lip balms for the purported relief of herpes labialis and as salves for treatment of muscle pains. These products may contain up to 392 mg/g of urushiol, well above the 0.05 to 0.005 mg that are needed to elicit a positive patch test reaction.<sup>42</sup> These preparations have caused allergic contact dermatitis in sensitized individuals when introduced in North America, and patch testing with them has actively sensitized some subjects.<sup>43</sup>

### SYSTEMIC CONTACT DERMATITIS

Numerous botanic extracts, ingested as foods or medicaments, have the potential to induce widespread cutaneous reactions through allergic or

toxic mechanisms. Systemic contact dermatitis is described in greater detail elsewhere in this issue, and may present with the following patterns of reaction in subjects previously sensitized by cutaneous exposure: (a) widespread eczematous or maculopapular eruption, (b) recall of the original dermatitis, (c) localized hand and foot dyshidrosis, and (d) the baboon syndrome.

Hamilton and Zug<sup>44</sup> reported a representative example of the baboon syndrome. Their patient had a past history of poison ivy dermatitis and suffered 2 episodes of pruritic dermatitis characterized by brightly erythematous plaques covering the buttocks, inner thighs, and axillary regions. These lesions occurred within 36 hours of eating raw cashews. In a series of 31 Korean patients, sensitized to *T. verniciflua*, who ingested the lacquer to treat gastrointestinal problems, maculopapular eruptions ensued in 65%, whereas EM and erythroderma were also seen.<sup>45</sup> Herbal teas, such as chamomile, have also triggered widespread eruptions and anal pruritus in individuals sensitized to SLs in Asteraceae.<sup>39</sup>

Ingestion of large amounts of psoralen-containing plants has resulted in enhanced phototoxicity during PUVA therapy.<sup>46,47</sup> Cattle that feed on St. John's wort, or *Hypericum perforatum*, develop phototoxic eruptions. Human consumption of extracts of this member of the family Clusiaceae has increased since the scientific demonstration of the antidepressant properties of hyperforin, one of its constituents.<sup>48</sup> A few human cases of cutaneous phototoxicity have been reported from its ingestion.<sup>49–51</sup>

### SUMMARY

The characteristic pattern of allergic phyto dermatitis is an intensely pruritic papulovesicular eruption, featuring irregular plaques and criss-crossing linear streaks. Similar lesions may be seen in the initial stage of phytophotodermatitis, but their resolution into darkly pigmented macules sign the diagnosis. Allergic contact dermatitis to Asteraceae simulates photodermatitis and presents as subacute to chronic eczema with marked lichenification. It is important for the clinician to be aware of these classic modes of presentation and also of the less common patterns, such as "tulip fingers," "hyacinth itch" and "sabra dermatitis," herein reviewed. Botanic extracts are ubiquitous and may cause dermatitis from cosmetics or topical medicaments. Their ingestion may at times cause widespread eruptions in previously sensitized individuals, and cutaneous exposure may give rise to erythema multiforme. The cutaneous manifestations of adverse reactions to

plants thus cover a wide range of clinical patterns that the informed clinician will be able to recognize.

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