

Contact allergy and medicinal herbs

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Summary

Herbal treatments are becoming increasingly popular, and are often used for internal as well as dermatological conditions, both externally as well as orally. The prevalence of contact sensitization against several plants especially of the Compositae family is quite high in Europe. Sensitization seems to occur relatively frequent with a few species such as arnica, elecampane and tea tree (oil), and occurs rarely with the majority. Testing for plant allergy is problematic because of the limited number of commercially available standardized patch test substances and the danger of active sensitization when testing with plants, parts thereof, or individual extracts. Knowledge about the allergic potential of plants is limited. Although plants are regarded as critical allergens by dermatologists, the number of reported cases of contact dermatitis is relatively small. Many widely used substances are not licensed as drugs or cosmetics. While the positive effects are frequently questionable or limited, the side effects are often more evident. Adverse effects of herbal medicines are an important albeit neglected subject in dermatology, which deserves further systematic investigation.

Introduction

A medicinal herb is a plant that contains specific active ingredients that enable it to be used for healing purposes or symptom relief (<http://de.wikipedia.org/wiki/Arzneipflanze>). The term “medicinal herb” is relative and is based on the use of the plant regardless of its botanical classification or habit. Any plant that can be used for medicinal purposes is considered a medicinal herb. Wikipedia alone lists nearly 200 plants and their effects. Some

plants which were originally considered important medicinal herbs are now considered luxury goods (e.g., tea, coffee, tobacco), culinary herbs and spices (e.g., pepper, cinnamon, basil), or foodstuffs (e.g., apples and citrus fruits). Medicinal herbs may be administered externally or orally to treat cutaneous [1] or internal disorders [2].

The widely-held belief that herbal remedies are basically harmless, “gentle” drugs is a misconception. Not only do

many of the plants used contain pharmacologically-active substances with pharmaceutical applications, a far greater number contain toxic substances or are capable of adversely interacting with other drugs. Another important factor to be considered is that most medicinal herbs contain substances that (may) have various, even opposite, effects. A single plant may produce chemical compounds that both act to prevent cancer and are also carcinogenic [3]. The list of

unwanted effects in the use of medicinal herbs and aromatherapy is long and includes reactions such as contact dermatitis [4], Stevens-Johnson syndrome [5], anaphylaxis, photosensitivity, and pellagra. Another disadvantage compared with synthetic drugs is that it is difficult to standardize the active ingredients contained in herbal remedies given varying climate, regional, and production conditions. Depending on manufacturer and even batch, there can be considerable variation in terms of dose and preparation. Any herbal drug available at the pharmacy must, in theory at least, meet the strict requirements of the applicable state Pharmacopoeia. A specific active ingredient content is thus ensured. Certain traditional medicinal herbs have been removed from the

Pharmacopoeia due to severe side effects. Some have no effect at all while others are effective, but less so than synthetic drugs. In still others, effectiveness has not been adequately tested, in part due to lacking commercial interest. Lastly, as the present paper addresses, a number of plants and plant substances used in herbal medicine are capable of causing contact sensitization [3].

Medicinal herbs with allergenic properties

The collected work “Botanical Dermatology” by Mitchell and Rook lists more than 10,000 species, belonging to 1405 genera and 248 families, which cause irritative or allergic contact dermatitis [6]. This does not include poisonous plants, of which there are an

estimated more than 189,000 species worldwide. In Europe, there are about 250 recognized contact-sensitizing families of plants. Of these, more than 200 belong to the Compositae family, while the rest are in the primrose, onion, (Inca) lily, carrot, orchid, and gesneriad families [3]. Almost all medicinal herbs [7] belong to the Compositae family (Table 1), not counting plants such as garlic or carrots, which despite having pharmacological properties that make them useful for folk remedies, are considered foodstuffs rather than drugs.

The distinguishing feature of Compositae is their sesquiterpene lactone content. Sesquiterpene lactones are characterized by a γ -butyrolactone ring bearing an exocyclic α -methylene group [8]. Hundreds of these molecules have

Table 1: Sensitizing Compositae in herbal remedies (and cosmetics) [11].

Plants	Allergen	Prevalence
Elecampane (<i>Inula helenium</i>)	SLs including alantolactone and isoalantolactone	Relatively common
Arnica (<i>Arnica montana</i>)	SLs including helenalin, xanthalongin etc.	Common
Common mugwort (<i>Artemisia vulgaris</i>)	Psilostachyin, psilostachyin-C (SLs)	Rare
Costus (<i>Saussurea lappa</i>)	Dehydrocostus lactone and costunolide (SLs)	Formerly more common (perfume)
German chamomile (<i>Chamomilla recutita</i>)	Anthecotulide (SL), possibly bisabolol (sesquiterpene alcohol), pollen, herniarin (coumarin), flavonoids?	Rare given widespread use
Roman chamomile (<i>Chamaemelum nobile</i>)	SLs including nobilin, probably bisabolol (sesquiterpene alcohol), possibly terpenes	Probably rare with widespread use
Stinking chamomile (dog chamomile) (<i>Anthemis cotula</i>)	Anthecotulide (SL)	Occasional, nowadays use is unintended
Burdock (<i>Arctium lappa</i>)	Actipicrin (SL)	Relatively rare
Dandelion (<i>Taraxacum officinale</i>)	Taraxinic acid-1'-O- β -D-glucopyranoside (SL)	Rare
Feverfew (<i>Tanacetum parthenium</i>)	SLs such as parthenolide	Rare
Marigold (<i>Calendula officinalis</i>)	Loliolide	Unknown
Yarrow (<i>Achillea millefolium</i>)	SLs such as α -peroxyachifolide, flavonoids in tea?	Rare (few reports)
Purple cornflower (<i>Echinacea purpurea</i>)	Unknown (pollen)	Rare
French marigold (<i>Tagetes patula</i>)	α -terthienyl (thiophene)	Rare

SL = sesquiterpene lactones

already been identified; cross-sensitizations are also possible and depend on stereochemistry.

The present paper focuses on three such plants (arnica, chamomile, tea tree) which are commonly used folk and household remedies and whose properties, allergenic ingredients, and allergologic relevance are well documented. Several other plants, for which there are only a limited number of studies on sensitization, are mentioned briefly (Table 1). For a more detailed description of all medicinal herbs with relevant allergenic properties used in Europe, the reader is directed to relevant standard works [3, 7].

Elecampane (Inula helenium L.)*

Elecampane is one of the oldest medicinal herbs, having been used during antiquity by the Greeks and Romans and even considered a cure-all during the Middle Ages [3] (Figure 1). The roots and leaves of the plant are used for relief of coughing symptoms and to treat respiratory ailments; it is also used as a vermicide and gastrointestinal tonic. Although elecampane is no longer widely used in treating skin diseases, mainly due to related contact sensitization, books on natural cosmetics still recommend use of elecampane extracts to treat eczema and acne, as well as for general beauty care. Elecampane is also recommended by ENT specialists for softening cerumen (earwax). In much of German-speaking Europe, elecampane was once believed to ward off evil spirits, and in the Styria region of Austria this belief persists even today.

At least 17 different sesquiterpene lactones have been identified in the above-ground parts of the plant and 6 in the root [3]. The most important contact allergens are alantolactone and isalantolactone (Table 1, Figure 2). Sensitization potential is high. Given its limited use, there are only occasional reports of sensitization. Patch test materials consist of an ether extract in 0.1% Vaseline, alantolactone 0.01% to 0.1% in Vaseline, or isalantolactone 0.1% in Vaseline. The threshold for irritation is very low and direct testing of plant substances should be avoided. Ether extraction of plants should be brief. Even an ether extract obtained by brief contact and diluted to a concentration of less than 1 % may occa-



Figure 1: True elecampane (*Inula helenium*); from *Koehler's Medicinal Plants* 1887.

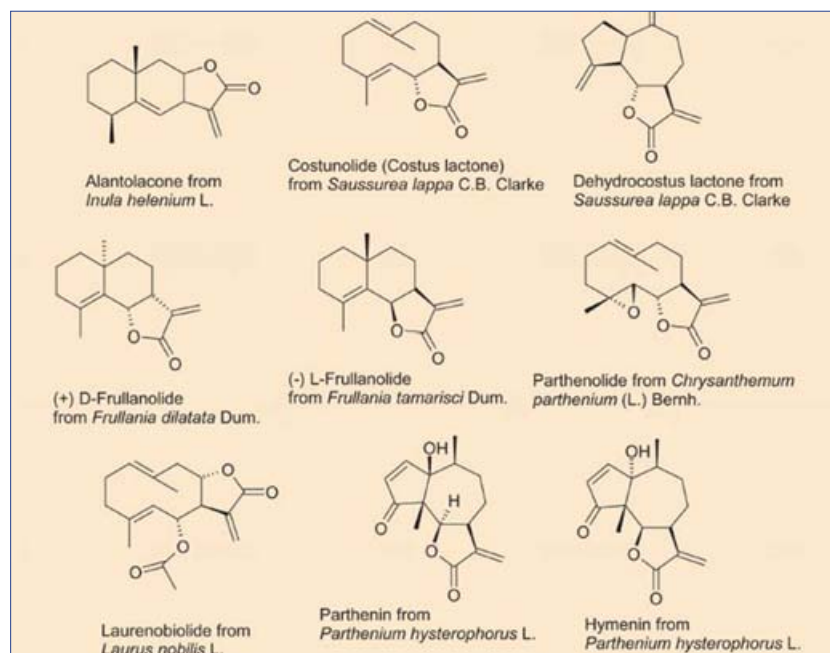


Figure 2: Chemical structure of selected allergenic sesquiterpene lactones (alantolactone, CAS 546-43-0, costunolide CAS 553-21-9, dehydrocostus lactone CAS 477-32-0, D-frullanolide CAS 40776-40-7, L-frullanolide CAS 27579-97-1, parthenin CAS 508-59-8 and its diastereoisomer hymenin, parthenolide CAS 20554-84-1 as well as laurenobiolide) [from 9].

* L. stands for Carl von Linné, the Swedish scientist who developed the modern binomial nomenclature for plants and animals, also known as the Linnean system. His name abbreviated as L. follows the scientific name of those plants described by him. This year is being celebrated by botanists as the year of Linné, for Carl von Linné was born on 23 May 1707 in southern Sweden and died in 1778 in Uppsala.

sionally cause severe irritation or even active sensitization [10]. Cross reactions also occur with chrysanthemums, sunflowers, and especially nodding bur-marigold.

Arnica (Arnica montana L.)

Arnica, which is a member of the Asteraceae (= Compositae) family, has been used in Europe since the 16th century as a household remedy, and since the 18th century in conventional medi-

cine [3]. Extracts from the flower head, leaves, stalk, and roots (Figure 3) are mainly used in topical remedies for bruises, muscle strains, crush injuries, hematomas, rheumatism, neuralgia, ischialgia, venous circulatory disorders, etc. It is also used in sanitary products, cosmetics, herbal liquors, bath additives, soaps, massage oils, first-aid ointments, and wound dressings for foot and mouth care. The most widely used form is arnica tincture, which is used in compresses

and bandages for sprains and minor sports-related injuries.

The ingredients found in arnica - hehelenalin, xanthalongin and carabron, as well as other sesquiterpene lactones - are classified as potential contact allergens (Table 1); a strong potential for sensitization has been found in the wild plant itself as well as the commercially-available drug substance and also isolated sesquiterpene lactones [3]. Because its uses are so varied, arnica allergy is relatively common [11]. Sensitizations are found among plant growers and harvesters as well as those who extract and process it, although the majority occurs in people who use arnica tincture or other topical remedies containing arnica [12]. One of the main causes of sensitization is due to improper use, i.e., failure to dilute the tincture when treating mild sprain injuries.

Patch test materials consist of either a 1:10 tincture prepared with ethanol, ether extract 0.5 % in Vaseline, or arnica sesquiterpene lactone 0.1 % in Vaseline [3]. It is important to note that while the (no longer commercially-available) Compositae mix contains arnica, it does not identify all patients with arnica allergy [13]. Cross reactions with other composites, especially tansy, yarrow, chrysanthemum, feverfew, and sunflowers are frequently reported. Cross reactions are also possible with other plants containing sesquiterpene lactones, e.g., bay leaf extracts or magnolia.

Common mugwort (Artemisia vulgaris L.)

Common mugwort was traditionally used in officinal and folk medicine as an antiepileptic and anthelmintic. It is now rarely used because it is poisonous, although it is still occasionally found in homeopathic medicine. The sesquiterpene lactones psilostachyin and psilostachyin-C (Table 1) are weakly sensitizing [11], and their concentration in European mugwort is low. Cross reactions should be expected in people with chrysanthemum allergy [3].

Costus (Saussurea lappa Clarke)

Costus is a Compositae that is widely used in traditional Indian medicine to treat bronchial asthma, cough, and cholera. The oil extracted from the root of the plant has been used since the end of the last century in perfume blends [3]. It contains various sesquiterpene lactones (Figure 2) and thus its sensitization potential is high, but reported



Figure 3: Arnica (*Arnica montana* L.): from Otto Wilhelm Thomé *Flora aus Deutschland, Österreich und der Schweiz*, 1885.

incidence of contact dermatitis remains low. Cross reactions with other Compositae are possible. It is mentioned because whatever is considered a good remedy in Indian folk medicine is bound to appear on the market sooner or later in Europe.

Chamomile (Chamomilla)

The name "chamomile" is used interchangeably for at least three different species, namely true or German chamomile (*Chamomilla recutita* L.) (Figure 4), Roman chamomile (*Chamaemelum nobile* (L.) All.), and dog chamomile (*Anthemis cotula* L.). German and Roman chamomile are both important medicinal plants, which, despite similar properties differ chemically [11].

Dog chamomile, or stinking chamomile (*Anthemis cotula* L.), was used in folk

medicine, just as true chamomile was, but it was not included in the pharmacopeia [3]. Since stinking chamomile is both strongly sensitizing (Table 1) and also has irritative properties, it is no longer used today and is thus not discussed further in the present paper.

True chamomile (*Chamomilla recutita* L.) is one of the oldest and most important medicinal herbs in the world; it has proven spasmolytic and anti-inflammatory effects and is found in a number of commercially-manufactured drugs either alone or combined with other extracts [3]. True chamomile is found in ointments, tinctures, laxatives, suppositories, medicinal soaps, cough and flu remedies, eye drops, acne lotions, prostate capsules, protective skin sprays, and numerous other products. More than 150 commercially-manufactured products are available in Germany. True chamomile is

also used widely in cosmetic and sanitary items, especially shampoos, conditioners, and bath additives, as well as in chamomile tea and chamomile vapors. True chamomile is one of the few plants whose healing effect is supported by experimental evidence. Its use rises annually, and now more than 60 % is imported in Austria. This is perhaps the root of the problem: possible contamination, since true chamomile is difficult to distinguish by appearance from stinking chamomile, which contains potent contact allergens [3].

True chamomile seems to have a very low sensitization potential, containing either no or only trace amounts of the sesquiterpene lactone anthecotulide (Table 1). Yet, in products of Chilean and Argentinian origin, levels of 0.003-0.01 % are found. In addition to anthecotulide, it appears that other ingredients are also potential contact allergens, since positive reactions are possible using a total extract of chamomile, despite negative test results for anthecotulide. Biologically-active compounds of the coumarin/flavonoid group, which are also present in true chamomile, may be responsible. The incidence of contact sensitization to true chamomile is very low. When sensitization does occur, the literature generally cites another species, usually stinking chamomile (*Anthemis cotula*), as triggering contact dermatitis. Patch test materials consist of 2.5 % of an ether extract in Vaseline, 0.1 % anthecotulide in Vaseline, or 1 % herniarin in Vaseline. People with chamomile allergy also react to a number of Compositae, especially chrysanthemum, common yarrow and marguerite.

Thus, although true chamomile seems to have a low potential for contact sensitization, the incidence and risk of immediate hypersensitivity are probably underestimated. Co-sensitization between chamomile pollen and mugwort or birch pollen is commonly reported [14]. Sensitization is triggered by Bet v1 and high molecular weight proteins which are responsible for the cross reactivity with other foods and pollen [14]. In addition, there are several reports that inhaling chamomile pollen or tea dust can trigger rhinitis or asthma, especially in occupational settings [15]. Anaphylactic reactions have also been observed after drinking chamomile tea [16] or after receiving a



Figure 4: True chamomile (*Chamomilla recutita* L.): from Koehler's Medicinal Plants 1887.

chamomile-containing enema during labor [17].

In addition to various other sesquiterpene lactones (Table 1), the most important of which being nobilin, Roman chamomile (*Chamaemelum nobile* L.) also contains flavonoids, the allergenic α -pinene and limonene as well as bisabolol. Its sensitization potential is thus moderate, although actual reports of sensitization are rare [3]. Patch test materials consist of a 1% ether extract in Vaseline, or 0.1% nobilin, or possibly other sesquiterpene lactones in Vaseline. Cross reactions with other Compositae are common. Allergic reactions have occurred in response to the version of Kamillosan[®] ointment sold in England which contains extracts and oil from Roman chamomile instead of German chamomile [18].

Burdock (Arctium lappa L.)

Extracts from the leaves and root of burdock have been used since antiquity in herbal teas for ailments such as rheumatism, gout, and skin rashes. Burdock oil is regaining popularity as a hair growth stimulant, used by patients with alopecia and dry seborrhea; its anti-inflammatory properties also make it useful in infusions and dressings in psoriasis and acne treatment [3].

The sesquiterpene lactone actiopicrin is presumably responsible (Table 1) for sensitization, although it is only weakly sensitizing. Patch test materials consist of 0.1 % actiopicrin in Vaseline or 10 % of an ether extract dispersed in Vaseline. Sensitization is rare. Cross reactions with other sesquiterpene lactone-containing Compositae should be expected.

Dandelion (Taraxacum officinale Weber)

Dandelions have been used in folk remedies since the Middle Ages, and are still used in a few European countries. Indications are numerous and include chronic eczema, warts, gallbladder disease, and gall stones. Dandelions are also used in salads, in cooking, and liquor and natural cosmetics [3]. Dandelions have only mild allergenic properties (Table 1); sensitization seems to require high exposure over a longer period of time. Two cases of contact allergy have been reported after treatment for warts, in one of which the patient had been directly exposed for a number of years as a result of feeding pet rabbits and turtles [19].

Feverfew (Tanacetum parthenium L. Schultz-Bip.)

Feverfew, another Compositae, is an old medicinal herb that was used to treat fever, headache, and stomachache as well as gynecologic and obstetric ailments (hence the colloquial name “mother herb”) [3]. It has recently become a popular folk remedy for migraine prevention. Severe inflammatory reactions involving the oral mucosa as well as swelling of the lips after ingestion of fresh plant leaves have been reported.

A 1% Vaseline extract is one of the components of the Compositae mix [20] (Table 1, Figure 2). Sensitizations presumably arise from direct contact with the plant itself or from cross reactions with chrysanthemum; at any rate these are more likely than sensitization to an herbal medicine or cosmetic product.

Marigold (Calendula officinalis L.)

As its Latin name indicates, the marigold has enjoyed widespread use in medicine for centuries, and the drug “Flores Calendula” is still available today in several countries in pharmacies [3]. Marigolds have traditionally been used primarily for wound-healing and treating skin diseases. Only recently, with its “rediscovery”, has the marigold become a popular ingredient in herbal cosmetics. Its allergens are unknown and it remains uncertain whether the sensitizing substance is a sesquiterpene lactone (SL) or the lactone loliolide (Table 1). Sensitization potential is weak and incidence is very low. No cross reactions have been reported to date. Yet, in contrast to the generally scant data supporting the incidence of sensitization [11] an Austro-German study found that out of 443 eczema patients tested consecutively, 9 were positive; in 4 patients the reactions were potentially clinically relevant and in 2 they were clinically relevant [12].

Yarrow (Achillea millefolium L.)

Yarrow is an old medicinal herb whose stalk and flowers are still sold in pharmacies. It has been used in preparations for internal and external remedies; also known as “knight's milfoil”, “soldier's woundwort” and “military herb”, it is presumed to have wound-healing activity [3]. Yarrow has spasmolytic effects and is thus used to treat digestive problems and liver disease. One of its main

uses today is in natural cosmetics as a “biological additive” [21].

The literature cites only few reports of sensitization despite its containing α -peroxyachifolide, an endoperoxide (Table 1). Recommended patch test materials are a 1% ether extract in Vaseline or α -peroxyachifolide 0.1 % in Vaseline. Cross reactions are common in people with Compositae allergies, especially with primary sensitization to chrysanthemum or feverfew. People with Compositae allergy should avoid any products containing yarrow such as herbal shampoos, cosmetics, and candies.

Purple cornflower (Echinacea purpurea L. Moench)

Originally a medicinal herb used by the Plains Indians in North America, purple cornflower has become a very popular herbal remedy throughout the western world [3]. Due to its posited immunostimulatory properties, purple cornflower is typically ingested orally for the prevention and treatment of upper respiratory tract infections or applied externally for recurrent genital candidosis. Its use as a topical remedy is based on its wound-healing activity which has been demonstrated in experiments. Side effects are rare, although there is the risk of severe immediate (even anaphylactic) reactions after oral ingestion [22]. Contact dermatitis has been observed in atopic patients, especially those with known sensitivity to Compositae. The allergens are not precisely defined (Table 1) and its specific sensitizing properties are still unclear.

French marigold (Tagetes patula L.)

The French marigold, of the Compositae family, is a strictly ornamental plant. It is known to contain phototoxic and allergenic α -terthienyl (Table 1). Sensitization has been reported in an aroma therapist [23].

Tea tree (Melaleuca alternifolia CHEEL)

“Tea tree” is broadly used to refer to a large number of shrubs and trees belonging to the Melaleuca (Figure 5) and *Leptospermum* genera, the most important of which is the Australia tea tree (*Melaleuca alternifolia*). Tea tree oil is advertised for the treatment of open wounds, various types of inflammatory skin conditions, acne, psoriasis, fungal



Figure 5: Tea tree (*Melaleuca alternifolia*, another species from which therapeutic oils can be distilled): from Koehler's Medicinal Plants 1887.

infections (nail, skin, or genital), decubitus, herpes (zoster, labialis, and genitalis), warts, gingivitis, muscle pain, lice, dandruff, neurodermatitis, burns, halitosis, rheumatism, diaper rash, sunburn, chilblains, varicose veins, corns, furuncles, insect bites, smoker's cough, sinus infections, and other disorders [3]. This is remarkable, considering that in Germany tea tree oil is neither registered nor licensed; nonetheless, it is aggressively marketed as a natural remedy for self treatment. Tea tree products are sold as creams, ointments, lotions, shampoos, soaps, lipsticks, and oils for cleansing, care and treatment of normal, dry, or oily skin. Toothpaste, mouthwash, blemish pads, blemish sticks, and bath oils are recommended as is aroma therapy. Tea tree oil does, in fact, possess antiseptic, bactericidal, fungicidal, and wound-healing properties, mainly attributed to

high concentrations of 1,8-cineole and rather low levels of terpinene-4-ol. The actual amounts contained in individual products have not yet been defined or documented.

Sensitization has been frequently reported in the past 15 years, and is typically due to d-limonene, α -terpinene, and aromadendrene, terpinene-4-ol, and p-cymene and α -phellandrene. Although sensitization potential has been shown by various test methods to be weak, the concentrations used were sometimes too low and the methods insufficiently sensitive. The incidence of sensitization has increased sharply since the mid 1990s and there are likely also a large number of unreported cases [24]. This increase is due to oxidation, partly caused by longer storage and frequent opening of bottles, which leads to increased sensitization potential. Similar to turpentine oil,

exposure to light, heat, and oxygen causes peroxides, hydroperoxides, and presumably also endoperoxides to develop, i.e., compounds that are much more powerful sensitizers than the original substance. The terpenes contained in tea tree oil are also present in other plants and plant oils such as jasmine oil. Reactions to other oils with the same ingredients should thus be expected. Patch test materials consists of 25% tea tree oil in diethylphthalate; undiluted tea tree oil occasionally leads to false-positive results [3].

Diagnosis

Whenever contact allergy to (medicinal) plants is suspected, a careful patient history is crucial and should include information on occupational or recreational contact, hobbies, trips, and visits. Certain aspects should be considered in establishing a diagnosis [3, 11]: if there is vague suspicion, patch testing with a commercially-available Compositae mix (no longer on the market due to the risk of active sensitization) or a sesquiterpene lactone mix, is an important, albeit often inadequate, first step (Table 2). The two mixes are not entirely identical; the Compositae mix [13, 20] has been shown to be superior to the sesquiterpene lactone mix [25] since some Compositae do not contain any of the three sesquiterpene lactones (alantolactone, costunolide, dehydrocostuslactone) in the sesquiterpene lactone mix. Its low sensitivity of 30 % could be at least partly explained by phytogeographic variation [26]. This could also explain why the Compositae mix (containing arnica, yarrow, tansy, German chamomile, and Roman chamomile) fails to positively identify some patients with sesquiterpene lactone allergy [27]. Other clues to plant-related contact allergy are positive reactions to perfumes, turpentine, and other common substances. If the reaction is believed to be caused by a specific plant, exact identification of the plant is necessary. There are unfortunately only a limited number of good, standardized test substances (Table 2) available on the market. In addition, not all manufacturers have allowed their products to be tested using the strict criteria of the Paul Ehrlich Institute. Possible test allergens include the patient's own personal care products as well as plant extracts and parts (root, stem, leaves,

Table 2: Commercial test extracts.

Substance	Test concentration	Manufacturer	Plant
Alantolactone	0.033 % in Vaseline	CT	Elecampane
Arnica flower extract	0.5 % in Vaseline	Hermal, CT	Arnica flowers
Arnica tincture	20 % in Vaseline	Hermal	Arnica
Chamomile flower extract	2.5 % in Vaseline	Hermal	True chamomile
Chamomile extract	1.0 % in Vaseline	CT	Roman chamomile
Compositae mix	6 % in Vaseline	Currently not on the market	Extracts from flowers of arnica, chamomile, feverfew as well as from the stalks of tansy and yarrow
Bay leaf oil	2 % in Vaseline	Hermal	Oils from the berry and leaves
Dandelion extract	2.5 % in Vaseline	CT	Dandelion
Feverfew flower extract	1 % in Vaseline	Hermal	Feverfew
Propolis	10 % in Vaseline	Hermal, CT	Propolis wax (INCI)
Tansy extract	1 % in Vaseline	Hermal, CT	<i>Tanacetum vulgare</i> (INCI)
Yarrow extract	1 % in Vaseline	Hermal, CT	<i>Achillea millefolium</i> (INCI)
Sesquiterpene lactone mix	0.1 % in Vaseline	Hermal, CT	e.g., in Compositae, cosmetics, and medicines

CT Chemotechnique

INCI International Nomenclature of Cosmetic Ingredients

flower, etc.) [3]. Recommendations available in the literature should be followed for patch testing in patients with potential plant allergy (Table 3); not only do

plants contain potent allergens, they may also contain strong irritants which can trigger irritative and questionably positive reactions (redness, edema). Any

positive reaction should thus be assessed against the backdrop of an appropriate patient history and the quality of the test substance and reaction; repeated open

Table 3: Allergens found in various plants as well as test concentrations.

Allergen	Substance class	Plant	Test concentration
Alantolactone	SL	Elecampane	0.05 %–0.1 % in Vaseline
Anthecotulide	SL	Dog chamomile	0.1 % in Vaseline
Arteglasin A	SL	American mugwort Chrysanthemum	0.1 % in Vaseline
Buteniny-2,2'-bithiophene	Bithiophene derivative	French marigold	0.1 % in Vaseline
Carabron	SL	Arnica	0.1 % in Vaseline
Costunolide	SL	Costus, bay leaf	0.1 % in Vaseline
Cynaropicrin	SL	Artichoke	0.1 % in Vaseline
Dehydrocostuslactone	SL	Costus root oil, bay leaf	0.1 % in Vaseline
1,1-dimethylallyl-caffeic acid ester	caffeic acid ester	Poplar buds, Propolis	0.1 % in Vaseline
Grossheimin	SL	Artichoke, Grossheimia species	0.1 % in Vaseline
Helenalin	SL	Arnica	0.1 % in Vaseline
Isoalantolactone	SL	Elecampane	0.1 % in Vaseline
Parthenolide	SL	Feverfew	0.1 % in Vaseline
α -Peroxyachifolide	SL	Yarrow	0.1 % in Vaseline
Taraxinic acid-1'-O- β -D-glucopyranoside	SL	Dandelion	0.1 % in Vaseline
α -Terthienyl	Thiophene derivative	Tagetes species	0.1 % in Vaseline

application test (ROAT) is (generally) not advisable for determining the relevance of contact allergies.

Clinical note

Although the specific therapeutic effect of many products containing medicinal herbs remains controversial, the available data hardly support an outright rejection of their use in folk remedies (and cosmetics). Despite widespread medicinal and cosmetic use of marigold, for instance, there are only isolated reports of sensitization. Indeed, aloe vera, one of the most popular modern herbal remedies, has not led to a single documented report of contact sensitization [28]. General recommendations that people with Compositae allergy should avoid any and all herbal remedies and natural cosmetics are thus not justified, although associated risks are difficult to quantify given the limited amount of data available. Kamillosan® is a special case. While immediate hypersensitivity is rarely associated with use of the product sold on mainland Europe, isolated reports do exist [18]. Reactions range from asthma and facial edema to anaphylactic shock. The same is true for contact sensitizations which are frequently associated with cross reactions to allergens in mugwort, yarrow, chrysanthemum, or marguerites [14]. The British Kamillosan®, which contains different ingredients, also has more contact allergens [18].

The aim of the present paper was not to address therapies that employ plant extracts, such as oral medications containing Chinese herbs in the treatment of atopic dermatitis which may lead to grave systemic problems [5], but rather to specifically discuss contact allergies associated with herbal medicine. Nonetheless, it is evident that the numerous, but largely ignored, adverse effects associated with the use of medicinal herbs deserve further study [5]. <<<

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