



Allergic contact dermatitis to flowers: the importance of personalized patch testing

Allergic contact dermatitis to flowers: the importance of personalized patch testing

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ABSTRACT

Plant contact dermatitis is a very common occupational problem. Flowers and leaves are reported to cause primary irritant dermatitis (both chemical and mechanical), allergic contact dermatitis, and phytophotodermatitis. Given the variety of plants that could potentially cause dermatoses and the way in which the diagnosis was established, we report a case of allergic contact dermatitis caused by the genus *Chrysanthemum* in a florist who had sought a diagnosis for more than 10 years. Fragments of the petals and leaves most frequently handled by the patient were used to create a personalized patch test that allowed conclusive diagnosis and, finally, appropriate management. We highlight the importance of carrying out personalized patch testing, especially in cases of suspected allergic contact dermatitis in which the standard test battery was negative and/or did not cover the suspected substances.

Keywords: Occupational dermatitis, allergic contact dermatitis, plants, *Chrysanthemum*.

RESUMO

A dermatite de contato por plantas é um problema ocupacional muito comum. Flores e folhas são relatadas como causadoras de dermatite irritativa primária, tanto química como mecânica, dermatite de contato alérgica e fitofotodermatites. Frente à variedade de plantas potenciais causadoras de dermatoses e o modo como foi concluído o diagnóstico, relatamos um caso de dermatite de contato alérgica pelo gênero *Chrysanthemum* em uma paciente florista que buscou seu diagnóstico por mais de 10 anos. Fragmentos das pétalas e folhas de manuseio mais frequente pela paciente foram utilizados para confecção de um teste de contato personalizado que permitiu a conclusão diagnóstica e correta condução da paciente. Assim, ressaltamos a importância da realização do teste de contato personalizado, em especial nos casos suspeitos de dermatite de contato alérgica, onde o teste (bateria padrão) resultou negativo e/ou as substâncias suspeitas não se encontraram contempladas.

Descritores: Dermatite ocupacional, dermatite alérgica de contato, plantas, *Chrysanthemum*.

Introduction

Plants are highly valuable in medicine for both their adverse and beneficial effects. Beneficial effects include treatment of ulcers, infectious diseases such as acne, herpes, and scabies, and inflammatory diseases such as psoriasis. However, plant can be responsible for several dermatoses.¹

Contact dermatitis from plants is a very common occupational problem,² and it is estimated that 50% of dermatoses among farm workers are due to plants, whereas reactions to pesticides and other chemical products account for less than 20%.^{1,2}

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The plants mostly involved in cases of dermatitis include those of the family *Asteraceae* (or *Compositae*), which has 1,535 genera and nearly 23,000 species. These plants are cultivated as ornamental, medicinal, apicultural, oleaginous, aromatic, insecticidal, and edible plants.^{3,4}

Given the wide variety of plants that could potentially cause dermatoses, the long patient journey to diagnosis, and the way in which it was established, we report a case of allergic contact dermatitis (ACD) from flowers of the genus *Chrysanthemum* in the family *Asteraceae*, highlighting the importance of personalized patch testing.

Case report

A 63-year-old female patient, florist, has complained of “body allergies” for 10 years. On dermatological examination, she presented with lichenification on the palm of her hands (Figure 1), excoriated brownish erythematous papules on her face, forearms (Figure 2A), and back in addition to erythema, fine desquamation, and hyperchromia on the right periorbital region (Figure 2B). The patient reported suffering from itching and erythema of the hands for 10 years, with worsening in the last two years and dissemination to other body sites. She told she had previously consulted six professionals and, at the



Figure 1

Palms of the hands: skin thickening with accentuation of palm lines (lichenification)

request of one of them, had undergone the patch test with a standard battery, which resulted negative. When asked about her occupation, she said she had worked with flowers for 25 years. Based on this information, we decided to perform a personalized



Figure 2

(A) Forearms: brownish erythematous papules, with some excoriations. (B) Right periorbital region: hyperchromia and fine desquamation

patch test using flowers and leaves most often handled by the patient.

Two leaves popularly known as “Guaricana” and “Avenção” (*Geonoma gamiova* and *Rumohra adiantiformis*, respectively) were included, as well as the petals and respective leaves of four flowers popularly known as “Chrysanthemum Calabria” (*Dendranthema grandiflorum*), “Chrysanthemum Rage” (*Dendranthema grandiflorum cv. Rage*), “Rose” (*Rosa spp.*), and “Canada goldenrod” (*Solidago canadensis*), totaling 10 possible allergens (Figure 3).

Specimens (leaves/flowers) were extracted, macerated, and applied directly on the skin, fixed with micropore tape.

In the first reading (48 hours) mild erythema was observed in test specimen number 1, and erythema and papules in test specimens number 3, 4, 5 and 6. In the final reading (96 hours) intense erythema, papules, and vesicles were observed in test specimens number 3, 4, 5 and 6, corresponding to Chrysanthemum Calabria petals, Chrysanthemum Calabria leaves, Chrysanthemum Rage petals, and








Plant	Popular names	Scientific name	Genus	Family	No. of test specimen
	Guaricana, Rabo-de-peixe	<i>Geonoma gamiova</i>	<i>Geonoma</i>	<i>Areaceae</i>	1
	Avenção, Leatherleaf fern	<i>Rumohra adiantiformis</i>	<i>Rumohra</i>	<i>Dryopteridaceae</i>	2
	Calabria, Chrysanthemum Calabria	<i>Dendranthema grandiflorum cv. Calabria</i>	<i>Chrysanthemum</i>	<i>Asteraceae</i>	3
	Chrysanthemum Calabria leaf	–	–	–	4
	Chrysanthemum, Red daisy, Chrysanthemum Rage	<i>Dendranthema grandiflorum cv. Rage</i>	<i>Chrysanthemum</i>	<i>Asteraceae</i>	5
	Chrysanthemum Rage leaf	–	–	–	6
	Red rose	<i>Rosa spp.</i>	<i>Rosa</i>	<i>Rosacea</i>	7

Figure 3
Possible allergens tested




Plant	Popular names	Scientific name	Genus	Family	No. of test specimen
	Red rose leaf	–	–	–	8
	Canada goldenrod	<i>Solidago canadensis</i>	<i>Solidago</i>	<i>Asteraceae</i>	9
	Canada goldenrod leaf	–	–	–	10

Figure 3 (continuation)
Possible allergens tested

Chrysanthemum Rage leaves, respectively (Figure 4).

In view of the result obtained, which is strongly suggestive of a causal relationship between patient's dermatitis and the tested plants, the diagnosis of ACD from flowers and leaves of the genus *Chrysanthemum* was established.

The patient was instructed on the need to avoid contact with the causative agent (*Chrysanthemum* genus plants) and/or using personal protective equipment such as mask and gloves. No topic or systemic medications were prescribed, only emollients. After one year of follow-up, the patient improved significantly, reporting only sporadic accidental contacts with symptom recurrence.

Discussion

Flowers and leaves are reported as causing primary irritant dermatitis, both chemical (e.g., venoms) and mechanical (e.g., thorns), ACD, and phytophotodermatitis.^{1-3,5} Furthermore, contaminants such as insecticides, agrochemicals, and arthropods may also be the responsible for dermatitis.⁵

Despite the small number of studies, a high incidence of ACD and phototoxicity from the family *Compositae/Asteraceae* are reported, with alantolactone, arcteglin A, arbusculin A, and other sesquiterpene lactones being the most commonly associated allergens.³⁻⁵



Figure 4
Personalized patch test: positivity for allergens 3, 4, 5 and 6 (*Chrysanthemum* Calabria petal, *Chrysanthemum* Calabria leaf, *Chrysanthemum* Rage petal, and *Chrysanthemum* Rage leaf, respectively)

Positive results in the personalized test for two flowers and their respective leaves of the genus *Chrysanthemum*, which is reported as an important causative agent of respiratory and cutaneous allergies within the family *Asteraceae*, corroborate current literature on the topic.⁴ In line with the present report, face and hands are the most involved sites.⁶

For the diagnosis of these dermatoses, the standard patch test may be useful, since there may be a possible cross-reaction between certain allergens and some substances used in the standard test battery (e.g., paraphenylenodiamine), contributing to diagnostic reasoning.⁵ A more effective alternative uses a mixture of sesquiterpene lactones or of *Compositae* plant extracts, detecting up to 90% of cases of allergy to this family. However, in daily clinical practice, these products are usually unavailable; therefore, the only feasible alternative is performing the patch test with the potential causative agents by applying them directly on the skin.⁴

The ethiopathogenic mechanism of the patch test is the same as that of ACD. Assuming a previous sensitization to the plant, the afferent pathway of ACD to the antigen was elicited. The performance of the patch test with the likely causative agents induces the formation of the afferent pathway by sensitized T lymphocytes and causes local injury. Reading of test results after 48h and 96h is justified by the time required for lymphocyte infiltration into the epidermis. The patch test was only indicated in this report because it was a case of ACD. In irritant contact dermatitis, the immunological phenomena described in ACD do not occur.

This report highlights the importance of a detailed history taking, especially in chronic/long cases, in which patients had already consulted several

medical specialties, underwent different treatments, and are sometimes skeptical about their problem. Furthermore, it is worth emphasizing that plants can cause dermatosis, especially those of the genus *Chrysanthemum*, which are widely used in floriculture. Finally, this report emphasizes the importance of personalized patch test, particularly in highly suspected cases and when the likely causative agents are not included in the standard test battery.

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