

CASE AND RESEARCH LETTERS

Allergic Contact Dermatitis Due to Tea Tree Oil[☆]



Dermatitis alérgica de contacto por aceite de árbol del té

To the Editor:

Tea tree oil is an essential oil that can be found in different everyday products, such as cosmetics, domestic products, massage oils, scented candles, mouthwashes, and personal-hygiene products.¹⁻³ Antioxidant, antibacterial, antifungal, antiviral, antiprotozoan, and antitumor properties have been attributed to this oil.⁴ It is usually applied topically, with a concentration ranging between 5% and 10%,² for the treatment of acne, seborrheic dermatitis, burns, fungal infections, and even chronic gingivitis.⁴

We report 2 new cases of allergic contact dermatitis due to tea tree oil. The first case (Fig. 1) is a 4-year-old girl who presented eczema-like lesions on the feet after spending 10 days at a summer camp. The patient was diagnosed with tinea pedis and had undergone treatment with a product containing tea tree oil. The second case (Fig. 2) is a 42-year-old man who presented eczema-like lesions on the eyelids and on the feet, which had appeared more than a year earlier and had worsened following topical application of tea tree oil during the last episode.

In both cases, we performed an epicutaneous study, applying the standard battery of the Spanish Cutaneous Contact and Allergic Dermatitis Research Group (GEIDAC) and the series of plants and cosmetics (Chemotechnique Diagnostic®). Moreover, in the first case, a study was performed with α -pinene and limonene, components of the tea tree that were available to us. Readings were taken on D2 and D4, as per the criteria of the International Contact Dermatitis Research Group (ICDRG) and positive results were found for colophony in the standard series and for tea tree oil in the cosmetic series in both cases. The diagnosis in both patients was allergic contact dermatitis due to tea tree oil with present relevance.

Tea tree oil is a volatile essential oil composed of a mixture of terpenic hydrocarbons and tertiary alcohols. It is distilled from the leaves of the *Melaleuca alternifolia* tree,^{1,2,4} a native of Australia that belongs to the *Myrtaceae* family, which includes approximately 3000 species.¹

Although it contains more than 100 components, current international standards establish the maximum and/or minimum amounts for 14 components of the essential oil.



Figure 1 A, Eczema-like lesions on the dorsal surface of both feet (Case 1). B, Positive epicutaneous tests (D4) for tea tree oil and for colophony (Case 1).



Figure 2 Positive epicutaneous tests (D4) for tea tree oil and for colophony (Case 2).

Nevertheless, it is highly complicated to define the exact components that cause the allergic contact dermatitis, as they are present in more than 100 different chemical substances, with a variable concentration in each commercially available product, in addition to the sometimes limited utility of the labeling. Certain factors, such as distillation and oxidation, can alter this oil. Oxidation of the essential oil can boost its sensitizing ability by as much as 3-fold^{3,5} and can occur through exposure to air or light.

Tea tree oil is toxic when taken orally^{4,6} and can cause vomiting, diarrhea, or coma.³ Although topical use of this

[☆] Please cite this article as: Martínez Campayo N, Goday Buján JJ, Fonseca Capdevila E. Dermatitis alérgica de contacto por aceite de árbol del té. Actas Dermosifiliogr. 2020;111:788–789.

oil is considered safe, different skin reactions have been reported in association with its use, including irritative dermatitis, erythema, erythema multiforme-like eruption, linear IgA bullous disease, systemic hypersensitivity reactions, and anaphylaxis.^{1,4,7}

In the cases described, we observed positive reactions to 5% tea tree oil and 20% colophony, considered as present relevance and cross reaction, respectively, in both patients. The cross reaction with colophony has been previously described in the literature.^{8,9} In the first case, we expanded the initial epicutaneous study to include α -pinene and limonene, which were both negative. Limonene is one of the components of tea tree oil and a positive result for this substance may be key to suspecting a possible contact allergy to tea tree oil.

Tea tree oil is an essential oil with considerable sensitizing power, especially in its oxidized form. Although allergic contact dermatitis due to this oil has been considered rare in our setting, the incidence has increased in recent years due to the popularity of alternative therapies and its presence in different commonly used products. In the epicutaneous tests, a positive result for limonene may be the key to suspecting possible contact allergy to tea tree oil and a cross reaction with colophony may be present.

Since 1991, approximately 100 cases of allergic contact dermatitis due to tea tree oil have been reported, of which only 5 have been reported in Spain.¹⁰ We report 2 new cases, one of which is the first case of allergic contact dermatitis due to this essential oil in a girl in Spain.

Funding

This study has not received funding of any kind.

Conflicts of interest

The authors declare that they have no conflicts of interest.

References

1. Crawford GH, Sciacca JR, James WD. Tea tree oil: cutaneous effects of the extracted oil of *Melaleuca alternifolia*. *Dermatitis*. 2004;15:59–66.

2. Larson D, Jacob SE. Tea tree oil. *Dermatitis*. 2012;23:48–9.
3. Aberer W. Contact allergy and medicinal herbs. *JDDG*. 2007;0(0), 071005084210002.
4. Pazyar N, Yaghoobi R, Bagherani N, Kazerouni A. A review of applications of tea tree oil in dermatology. *Int J Dermatol*. 2013;52:784–90.
5. Rutherford T, Nixon R, Tam M, Tate B. Allergy to tea tree oil: retrospective review of 41 cases with positive patch tests over 4.5 years: allergy to tea tree oil. *Australas J Dermatol*. 2007;48:83–7.
6. Hammer KA, Carson CF, Riley TV, Nielsen JB. A review of the toxicity of *Melaleuca alternifolia* (tea tree) oil. *Food Chem Toxicol*. 2006;44:616–25.
7. Khanna M, Qasem K, Sasseville D. Allergic contact dermatitis to tea tree oil with erythema multiforme-like id reaction. *Am J Contact Dermatitis*. 2000;11:238–42.
8. Selvaag E, Eriksen B, Thune P. Contact allergy due to tea tree oil and cross-sensitization to colophony. *Contact Derm*. 1994;31:124–5.
9. Groot AC, Schmidt E. Tea tree oil: contact allergy and chemical composition. *Contact Dermatitis*. 2016;75:129–43.
10. Sanesteban Muruzábal R, Hervella Garcés M, et al. Efectos secundarios de la aplicación tópica de un aceite esencial. *Dermatitis alérgica de contacto a aceite del árbol de té*. *An Sist Sanit Navar*. 2015;38.

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10 December 2018 19 March 2019

<https://doi.org/10.1016/j.adengl.2019.03.032>

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Erythema Papulosa Semicircularis Recidivans: A New Entity or a Subtype of Erythema Annulare Centrifugum?*



Eritema papular semicircular recidivante: ¿nueva entidad o subtipo de eritema anular centrifugo?

To the Editor:

Erythema papulosa semicircularis recidivans (EPSR) is a recently described entity characterized by the appearance of semicircular erythematous plaques with a centrifugal

extension and of a clearly seasonal nature, starting in spring or summer and resolving spontaneously in colder seasons.¹ The principal differential diagnosis is established with figurate erythema,² especially erythema annulare centrifugum (EAC) and, specifically, its annually recurring subtype (AR EAC).³ We report the case of a patient with recurring annular lesions that oblige us to consider the differential diagnosis between these 2 entities.

A 70-year-old woman with a history of ischemic heart disease, hypothyroidism, thromboembolic disease, and chronic gastritis visited our department in the month of May with a large erythematous plaque in the abdominal region that had appeared 2 weeks earlier and had expanded centrifugally (Fig. 1). The patient stated that the lesion caused pruritus and moderate pain. She had no fever, joint pain, or any other symptoms. In total, the patient had had 6 independent episodes of lesions in a similar location and of similar clinical characteristics. The first episode had occurred 9 years earlier (Fig. 2). All the episodes had begun in the spring or summer months and had resolved spontaneously in the early autumn.

* Please cite this article as: Bernia E, Requena C, Llombart B. Eritema papular semicircular recidivante: ¿nueva entidad o subtipo de eritema anular centrifugo? *Actas Dermosifiliogr*. 2020;111:789–791.