

Lichen Extracts

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Lichen-derived additives to commercial products are becoming a more frequent cause of allergic contact dermatitis. The most common lichen-derived additives are usnic acid and oak moss absolute. Both are useful for screening patients using “natural” or “botanical” products that may contain lichen-derived additives.

FROM “BABY CREAMS” to deodorants to face and body lotions, extracts of lichen and other botanicals are becoming common additives in personal care products. Numerous plant types are used in the same product, most often from the Compositae family of flowers and various lichens. Lichen-derived products are widespread in the United States and Europe; one estimate counted more than 90 deodorants and perfumes or colognes that explicitly list lichen-derived ingredients¹ and countless other such products that use potentially allergenic plants of the Compositae family. Many consumers use these products in a desire to be more “environmentally friendly” and “natural,” unaware that in addition to having biologic activity, these plant extracts are also potential causes of allergic contact dermatitis. Awareness of the allergenicity of lichen-derived compounds is essential.

The more than 17,000 lichen species found on about 8% of the earth’s surface have long been recognized as being useful to humans as a source of food, textile dyes, and medicines.² Native Americans in the Pacific Northwest of the United States used the lichen *Usnea longissima* for wound dressings,³ just as the ancient Egyptians used other lichens.² More recently, lichen extracts have been shown to possess activity against both gram-positive and gram-negative organisms (including vancomycin-resistant *Enterococcus* and methicillin-resistant *Staphylococcus aureus*) as well as antiviral, antimycobacterial, antifungal, and antiprotazoal properties.^{2,4} Because of these properties, lichen extracts are being added more frequently to topical

products, especially deodorants and moisturizing or “healing” creams for the skin.

The most commonly extracted product of lichen is usnic acid. Chemically, usnic acid is a dibenzofuran, which is related to the furocoumarins but is rarely photosensitizing.⁵ In addition to causing allergic contact dermatitis, usnic acid has been linked to hepatic failure from the ingestion of a slimming aid.⁶ Less frequently extracted allergenic compounds include atranorin and everinic acid.⁷ As opposed to usnic acid, atranorin has been reported as a photosensitizer. Lichen acid extract from *Evernia prunastri* (which grows on oak trees) is used as a fragrance component.

A commercial allergen approved by the Food and Drug Administration for patch-testing for suspected lichen extract allergy is not available in the United States. For custom extended-series patch testing, a lichen acid mix is available from Chemotechnique (Malmö, Sweden); it contains usnic acid, atranorin, and everinic acid, all at 0.1% in petrolatum. Each allergen is also available separately from Chemotechnique, and usnic acid 0.1% in petrolatum is available from Hermal (Reinbeck, Germany). Oakmoss absolute is one of the eight components of fragrance mix I and is also available separately from Chemotechnique and Hermal.

Patch testing with the standard lichen acid mix is a useful and helpful method for confirming lichen-related allergic contact dermatitis. In regard to commercially available leave-on products, patch-testing with the product “as is” should be considered. The addition of lichen extracts to the patch test series is indicated for patients who use products labeled with botanical, natural, organic, or aromatherapy-type ingredients or for those who use botanical products that do not produce a relevant positive reaction on patch tests with the standard screening tray.⁵ A suspicion of lichen derivatives in products and an awareness of their potential for causing allergic dermatitis

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are essential for diagnosing patients who use “natural” products.

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