

Lavender

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Lavender is a commonly used product in personal and household care items as well as for aromatherapy. It is increasing in popularity as a fragrance. Additionally, multiple recent publications attest to its antimicrobial activity. Whereas lavender has been associated with irritant dermatitis, allergic contact dermatitis, and photodermatitis, it is anticipated that with increasing exposure, more patients will experience these complications. Most cases of allergic contact dermatitis have been reported as being due to occupational exposures through massage and aromatherapy. One study of the Japanese population demonstrated an increased incidence of contact dermatitis from lavender (from 1.1% to 13.9% over 8 years). It is important that clinicians recognize lavender as a potential allergen.

ALTHOUGH LAVENDER has been used for centuries for therapeutic and cosmetic purposes, its impact on dermatology and medicine has only recently been recognized as its popularity increases.¹ It was named “Herb of the Year” in 1999 by the International Herb Association, and most of us are familiar with its scent in consumer products. It is most commonly used in dried form or as an essential oil produced by steam distillation of the flower heads and foliage. Lavender belongs to the family Lamiaceae and the genus *Lavandula*. There are four main species of lavender: *Lavandula latifolia*, *Lavandula stoechas*, *Lavandula intermedia*, and *Lavandula angustifolia* (formally known as *Lavandula officinalis*), the species most commonly used in essential oils. Lavender essential oil is a mixture of numerous ingredients; linalool, linalyl acetate, and camphor are the main components.

Traditionally, lavender oil has been thought to have carminative (smooth muscle-relaxing), sedative, antedepressive, antimicrobial, and acaricidal properties. It is commonly used individually and in combination as a fragrance in personal products such as soaps, cleansers, and moisturizers, and for aromatherapy or massage (Table 1).^{2,3} As its popularity as a fragrance or antimicrobial agent

increases, lavender may possibly be used in products that are not listed in Table 1. As an aromatherapy agent, lavender is thought to produce physiologic effects through the limbic system and may promote feelings of well-being. Linalyl acetate and linalool have narcotic and sedative actions,^{1,4} and lavender aromatherapy has been demonstrated to improve sleep in older patients and reduce anxiety in the intensive care unit setting.^{1,5,6} In animal studies, lavender

Table 1. Personal and Home Care Products Containing Lavender*†

Seventh Generation Natural Lavender Fabric Softener (Seventh Generation, Burlington, VT)
Seventh Generation Natural Lavender Laundry Liquid (Seventh Generation)
Paul Mitchell Tea Tree Special Shampoo (Paul Mitchell, Beverly Hills, CA)
Burts Bees Apricot Baby Oil (Burts Bees, Durham, NC)
Ivory Moisturizing Body Wash, Natural Honey (Procter & Gamble, Cincinnati, OH)
Ivory (Procter & Gamble, Cincinnati, OH)
Ivory Moisturizing Body Wash, Fresh Snow (Procter & Gamble)
Vaseline Intensive Care Lotion, Aloe & Naturals (old product) (Unilever, London, UK)
Avon Vintage Cologne Spray (Avon, New York, NY)
Pure Elements Hydrating Conditioner (Dry or Permed) (Naturelle, Chicago, IL)
Quit Nits Complete Lice Kit (Wild Child, West Perth, Australia)
Quit Nits Everyday Preventative Spray (Wild Child)
8in1 Perfect Coat Select Antibacterial Deodorizing Shampoo (8in1, Islandia, NY)

*Lavender may also be found in dish detergents, air fresheners, disinfectants, scented candles, herb teas, “natural” first-aid oils, nipple ointments, bath salts, hair coloring, lip creams, acne creams, and bite and sting remedies.

†This list is not comprehensive; the increased use of lavender as a fragrance and antimicrobial agent may result in its inclusion in new products not listed.

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has also been found to have antispasmodic actions in the ileum and uterine smooth muscle,¹ and it may have similar actions in humans.⁷ As such, it has been used in midwifery to relieve pain following labor, and *Lavandula stoechas* has been used as a muscle relaxant for headaches.¹

Recently, there has been renewed interest in lavender as an antimicrobial agent. *Lavandula angustifolia* oil was demonstrated to have action against drug-resistant bacteria, including methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus faecalis*,⁸ as well as *Haemophilus influenza*, *Streptococcus pyogenes*, *Staphylococcus aureus*, and *Escherichia coli*.⁹ The in vitro antimicrobial activities of lavender essential oil in cosmetic products against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Candida* sp, and *Aspergillus niger* were demonstrated by Kunicka-Styczynska and colleagues, who suggested that synthetic preservatives in products could be replaced by lavender or tea tree oil.¹⁰ Additionally, lavender oil and vapor have been shown to have antifungal properties; the oil has been shown to inhibit the germination and growth of *Botrytis cinerea*, whereas lavender vapor has been shown to inhibit the growth of *Aspergillus fumigatus* and is similar to tea tree oil in its in vitro antimicrobial activity. Lavender has been used for its acaricidal activity against mites, grain weevils, aphids, and clothes moths.^{1,11–13}

Lavender has also been associated with hormonal modulation. *Lavandula latifolia* has been used as an abortifacient,¹ and some references suggest that lavender be avoided in pregnancy.^{14,15} Lavender has been used to stimulate menstruation, although its action as an emmenagogue has not been established scientifically. Of interest, lavender and tea tree oil were linked to prepubertal gynecomastia in three boys; this was attributed to the estrogenic and antiandrogenic properties of the oils.¹⁶

In dermatology, lavender has been used for wounds, eczema, and psoriasis and even to promote hair growth in alopecia areata, with little supporting evidence. Although lavender and other essential oils have been investigated as alternative treatments of eczema, no significant difference was noted when aromatherapy massage and massage-only groups were compared.¹⁷ However, an open study of individuals treated with essential oils showed improvement in self-reported symptoms, confidence, and self-esteem in 14 of 15 persons with psoriasis.¹⁸ A mixture of lavender oil, rosemary, cedarwood, and thyme was studied by Hay and colleagues in 1998 in a randomized double-blinded controlled trial involving 86 patients with alopecia areata. Nineteen of 35 patients in the treatment group

reported improvement in their alopecia, compared to 6 of 28 individuals in the control group.¹⁹

Despite their potential therapeutic uses, lavender oil and vapor are associated with irritant dermatitis, allergic contact dermatitis, and in some cases, photodermatitis. It has been demonstrated that lavender oil and linalool is directly cytotoxic to human fibroblast and endothelial cells in vitro.²⁰ The mechanism of action is unknown but may be related to membrane compromise, which may lead to irritant dermatitis and allergic sensitization. Although linalool and linalyl acetate—the major components of lavender oil—are weak allergens and sensitizers, they produce several oxidation products immediately upon contact with air. These products include the following linalool and linalyl acetate hydroperoxides: 7-hydroperoxy-3,7-dimethylocta-1,5-diene-3-ol and 6-hydroperoxy-3,7-dimethylocta-1,7-diene-3-ol (by-products of linalool), as well as 7-hydroperoxy-3,7-dimethylocta-1,5-diene-3-yl acetate and 6-hydroperoxy-3,7-dimethylocta-1,7-diene-3-yl acetate (products of linalyl acetate). These hydroperoxides are stronger allergens; thus, exposing lavender oil to air increases its sensitizing potential.^{21–23}

Several case reports and case series have reported allergic contact dermatitis from lavender (Table 2).^{24–30} Hairdressers, aromatherapists, naturopathic therapists, reflexologists, physiotherapists, and massage therapists are particularly at risk of contact dermatitis from lavender oil.^{24,27,28,30} A study of massage therapists showed a high prevalence of hand dermatitis, and a significant risk factor was the use of aromatherapy products in oils, lotions, or creams.³¹ Patients also develop allergic contact dermatitis when they perform self-treatment. Airborne allergic contact dermatitis from lavender and essential-oil vapor was described in a 53-year-old man,²⁶ and a 28-year-old woman developed a complicated vulvovaginitis worsened by contact dermatitis to tea tree and lavender oil when she began treating her vaginal pruritus and soreness with products containing those ingredients.²⁹ The distribution of the dermatitis (whether on the hands, face, exposed head and neck, or areas of application) reflects the context of exposure. The most extensive study of the incidence of contact dermatitis from lavender oil to date was performed from 1990 to 1998 in Japan, where lavender oil has the highest market share of the essential oils.³² The overall rate of sensitivity to lavender oil was 3.7%, higher than the rates for the other fragrances tested, and the rate increased from 1.1% in 1990 to 13.9% at the study's end in 1998. The authors attributed the increase to the popularity of lavender oil in Japan in the 1990s and to increased encounters with lavender herb

Table 2. Patient Data from Reported Cases of Contact Dermatitis from Lavender

<i>Study or Case Report</i>	<i>Age (yr)</i>	<i>Gender</i>	<i>Occupation</i>	<i>Involvement</i>	<i>Exposure</i>
Brandao FM (1987)	18	F	Hairdresser	Hands, fingers, front of wrists	Lavender shampoo
Schaller M and Korting HC (1995)	53	M	(Patient)	Disseminated in all exposed areas (scalp, face, neck, hands)	Evaporated essential oil
Keane FM et al (2000)	41	F	Aromatherapist	Hands, forearms	Essential oils
Varma S et al (2000)	28	F	(Patient)	Groin	Cream with lavender oil (for pruritus)
Bleasel N et al (2002)	52	F	Masseuse, aromatherapist	Hands, forearms	Massage oils
	46	F	Masseuse, aromatherapist	Hands, forearms	Massage oils
	45	F	Natural therapist	Hands, face, neck	Massage oils
	29	F	Analytic chemist (with interest in aromatherapy and massage)	Hands, face, neck	Massage oils
Boonchai W et al (2007)	39	F	Masseuse, aromatherapist	Hands, feet	Essential oils
Trattner A et al (2008)	56	F	Naturopathic therapist	Hands, face	Essential aromatherapy oils
	61	F	Masseuse	Hands	Essential aromatherapy oils
	43	F	Masseuse, reflexologist	Hands	Essential aromatherapy oils
	51	F	Physiotherapist	Hands, extremities	Essential aromatherapy oils
	56	F	Reflexologist	Hands and disseminated	Essential aromatherapy oils

F = female; M = male.

gardens, lavender-scented household goods, and lavender aromatherapy in daily life. Lavender has also been described as a photocontact allergen, especially when used as a component of the ketoprofen vehicle. A 45-year-old woman with a rash on her left foot after using ketoprofen gel was found to be photopatch test positive to lavender oil.³³ In one series from Belgium, 3 of 15 patients with allergy to ketoprofen had positive photopatch-test reactions to lavender oil, and 1 of 15 patients had a positive patch-test result.³⁴

Lavender is an herb that has found many uses since ancient times and continues to be popular today. Its increased popularity as an essential oil in personal care and household products as well as in aromatherapy underscores the importance of clinicians' recognizing its role as a potential allergen.

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