

Contact Dermatitis. 2000 Feb;42(2):68-73.

Increase in sensitization to oil of turpentine: recent data from a multicenter study on 45,005 patients from the German-Austrian Information Network of Departments of Dermatology (IVDK).

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Contact allergy to oil of turpentine was reported to have become rare. However, the evaluation of standardized data of 45,005 patients tested 1992-1997 in 30 Dermatological Centers associated with the German-Austrian Information Network of Departments of Dermatology (IVDK) showed an increase in positive patch test reactions to turpentine from 0.5% during the years 1992-1995, up to 1.7% in 1996 and 3.1% in 1997. In particular, 17,347 patients tested in 1996-1997 were evaluated in detail by comparing 431 individuals with positive patch test reactions with the rest of the group found negative to turpentine. Using the so-called MOAHLFA index, the following characteristics were shown. Turpentine allergy (a) was found to be significantly less frequent in men and in patients with occupational dermatitis, (b) showed no difference in its association with atopic dermatitis, (c) patients with turpentine allergy had significantly less symptoms of the hands, more symptoms of the legs or in the face and (d) were significantly more often aged over 60 years. Also, patients sensitized to turpentine had increased rates of additional sensitizations. The definite reason for the increase in turpentine sensitization in the population tested here is not clear. Therefore, a detailed exposure analysis is necessary; the new increase in turpentine allergies may be due to popular topical remedies or household chemicals.

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[Allergic contact dermatitis to cosmetics containing *Melaleuca alternifolia* (tea tree oil)]

[Article in French]

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INTRODUCTION: *Melaleuca alternifolia* is a coniferous tree found in tropical regions, the needles contain an essential oil that is used in medical and cosmetic products. The essential oil contains turpentine (limonene, alpha-pinene, phellandrene) that are potentially allergenic. **PATIENTS AND METHODS:** In 1997, 1216 patients were patch tested in our dermatologic unit. Fourteen of them tested because of eczema used products containing tea tree oil. The patients used creams, hair products and essential oils containing *Melaleuca alternifolia* for cosmetic reasons and to treat skin affections. They were patch tested for a standard panel of allergens, topical emulgators, perfumes, plants, topical medications, metal, gloves, topical disinfectants and preservatives, dental products and rubber derivatives. Products containing *Melaleuca alternifolia* were tested concentrated or diluted. **RESULTS:** We report on 7 cases of patients with an allergic contact dermatitis due to tea tree oil. Two of them

also exhibited from a delayed type IV hypersensitivity towards fragrance-mix or colophony suggesting the possibility of cross reaction or an allergic group reaction caused by contamination of the colophony with the volatile fraction of turpentine. **DISCUSSION:** The allergic potential of low concentrations of *Melaleuca alternifolia* is presumed to be low on healthy skin. Photoaged *Melaleuca alternifolia* must be considered to be a stronger sensitizer.

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Compound tincture of benzoin: a common contact allergen?

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The results of patch testing to compound tincture of benzoin in 477 patients performed at the Contact Dermatitis Clinic at the Skin and Cancer Foundation in Melbourne during 1999 are presented. There have been fewer than 30 reported cases of contact allergy from compound tincture of benzoin, and none in the last decade. Our results showed 45 out of the 477 patients had a positive reaction to compound tincture of benzoin, which was the third most common allergen in our series. Of these 45 patients, 14 had strong positive reactions, but only two definitely recalled exposure to compound tincture of benzoin and these were clinically relevant. Twenty-eight of these patients had cross-reactions to similar allergens (fragrance mix, balsam of Peru, colophony and tea tree oil). Of the 14 patients with a strong positive reaction to compound tincture of benzoin, 11 had at least one other positive cross-reaction to the above allergens. This may explain the high frequency of reaction to compound tincture of benzoin found in our study.

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Results of patch testing with lavender oil in Japan.

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We report the annual results of patch testing with lavender oil for a 9-year period from 1990 to 1998 in Japan. Using Finn Chambers and Scanpor tape, we performed 2-day closed patch testing with lavender oil 20% pet. on the upper back of each patient suspected of having cosmetic contact dermatitis. We compared the frequency of positive patch tests to lavender oil each year with those to other fragrances. We diagnosed contact allergy when patch test reactions were + or <+ at 1 day after removal. The positivity rate of lavender oil was 3.7% (0-13.9%) during the 9-year period from 1990 to 1998. The positivity rate of lavender oil increased suddenly in 1997. Recently, in Japan, there has been a trend for aromatherapy using lavender oil. With this trend, placing dried lavender flowers in pillows, drawers, cabinets, or rooms has become a new fashion. We asked patients who showed a positive reaction to lavender oil about their use of dried lavender flowers. We confirmed the use of dried lavender flowers in 5 cases out of 11 positive cases in 1997 and 8 out of 15 positive

cases in 1998. We concluded that the increase in patch test positivity rates to lavender oil in 1997 and 1998 was due to the above fashion, rather than due to fragrances in cosmetic products.

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Gas chromatography: an investigative tool in multiple allergies to essential oils.

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Essential or fragrant oils are volatile odourous mixtures of organic chemical compounds that are widely used in aromatherapy and in the perfume industry. Because of their frequent use, allergy to essential oils is being increasingly recognized. We report 2 cases of multiple allergies to essential oils in professional aromatherapists. Gas chromatography/mass spectrometry was used to analyse the oils in order to identify a common allergen responsible for the contact dermatitis. In both the cases, alpha- and beta-pinene were found to be the most common constituent in the oils and thus appeared to be key allergens. alpha-pinene was confirmed as an allergen on repeat patch testing with pure alpha-pinene in both cases. 12 controls tested were negative for the same. Gas chromatography-mass spectrometry was found to be an extremely useful tool that could be utilized in investigating multiple allergies to essential oils.

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Degradation products of monoterpenes are the sensitizing agents in tea tree oil.

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BACKGROUND: Patients using tea tree oil (TTO) topically may become sensitized to this natural remedy. More than 30 cases have been documented in the literature since 1991. **OBJECTIVE:** Freshly distilled, as well as oxidized TTO, some fractions, and single constituents were used for experimental sensitization in guinea pigs. TTO was stored on a window sill to study the influence of light, oxygen, and warmth. The oxidized oil and different fractions were devoted to experimental sensitization in guinea pigs to determine their sensitizing potency. Fifteen constituents were patch tested in TTO-sensitive patients to find how many may play a role as contact allergens. **METHODS:** Guinea pigs were sensitized by a modified FCA-method (Freund's complete adjuvant) with freshly distilled TTO, oxidized TTO, the monoterpene and sesquiterpene fraction, and 1, 8-cineole. TTO-sensitive patients were tested with 15 typical constituents and degradation products. Gas chromatographic analysis was used to detect degradation products of the deteriorated TTO. **RESULTS:**

Fresh TTO was revealed to be a very weak sensitizing material whereas oxidized TTO was 3 times stronger. The monoterpene fraction showed to be a stronger sensitizer than the sesquiterpene fraction. All 11 patients reacted mostly with a +-plus or even a -plus reaction to alpha-terpinene, terpinolene and ascaridol. alpha-Phellandrene became positive in four patients, myrcene in only two. Gas chromatographic analyses showed that the formation of peroxides increased within 4 days from less than 50 to more than 500 ppm. Peroxides, epoxides and endoperoxides were formed. Deterioration products of alpha-terpinene were found to be mainly p-cymene, ascaridol, isoascaridol, a ketoperoxide, and colorless crystals that likely were 1,2,4-trihydroxy menthane. The p-cymene content increased dramatically from 2% to 11.5%. alpha- and gamma-terpinene, as well as terpinolene, were reduced to one half of their former concentration. Ascaridol and isoascaridol have never before been found in TTO. CONCLUSION: Tea tree oil kept in open and closed bottles or other containers undergoes photooxidation within a few days to several months, leading to the creation of degradation products that are moderate to strong sensitizers. Peroxides, epoxides and endoperoxides, like ascaridol and 1,2,4-trihydroxy menthane, are formed. These must be considered responsible for the development of allergic contact dermatitis seen in individuals treating themselves with the oil. A test series with 15 characteristic constituents is recommended for patch testing.