

Contaminating resin acids have not caused the high rate of sensitivity to oak moss

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Commercially available oak moss absolute patch test material has recently been shown to contain resin acids of the type found in colophony (colophonium). We wished to assess whether the high frequency of positive patch tests to oak moss absolute at this institute was likely to reflect significant contamination by resin acids. The rate of positive reactions to colophony among our oak moss-allergic patients patch tested during 1984–2000 was retrospectively investigated. 25,395 patients were tested to the European standard series during this period and 1,963 (7.7%) were allergic to the fragrance mix. 342 of these patients were allergic to oak moss absolute, of whom 73 (21.3%) were allergic to colophony. In comparison, 115 (13.4%) of 861 fragrance mix-positive but oak moss-negative patients were allergic to colophony ($p = 0.0002$, Fisher's exact test). This strongly statistically significant association between oak moss absolute and colophony shows only a small increase in rates of allergy to colophony in oak moss-positive patients. Thus we conclude that contaminating resin acids have not alone caused the high rate of sensitivity to oak moss.

Key words: allergy; colophonium; colophony; fragrance; oak moss; patch tests; resin acids. © Blackwell Munksgaard, 2002.

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Oak moss is now the most frequent sensitizing constituent in the 8% fragrance mix, accounting for almost 40% of positive reactions to the constituents of the mix in London (1). A recent paper found commercially available oak moss absolute patch test material (Hermal, Trolab, Germany and Chemotechnique, Malmo, Sweden) to contain a significant portion of resin acids of the type found in colophony (colophonium) (2). 9 of 17 patients allergic to colophony also reacted to oak moss absolute (53%). The authors suggested that a positive reaction to oak moss may imply allergy to colophony rather than to fragrance (2). To investigate this hypothesis, we have looked at the rate of positive reactions to colophony among our oak moss-allergic patients during the period 1984–2000.

Patients and Methods

The study was retrospective, and included all 25,395 patients who were tested to the European standard series at this institute between 1 January 1984 and 31 December 2000. Some patients thought from their history to be fragrance-allergic or who had a positive reaction to the fragrance mix were also tested to the constituents of the mix

(obtained from Hermal). These are oak moss absolute, cinnamal, cinnamic alcohol, isoeugenol, eugenol, hydroxycitronellal, geraniol, alpha-amyl cinnamal (all 1% pet.) and the emulsifier sorbitan sesquiolate (20% pet.). Positive reactions were defined according to the recommendations of the International Contact Dermatitis Research Group: ?+, faint erythema only; +, erythema, infiltration, possibly papules; ++, erythema, infiltration, papules, vesicles; ++++, intense erythema, infiltration and coalescing vesicles. Negative reactions were defined as those with no visible reaction or those classed as irritant. Among all patients tested, rates of positive reactions to the fragrance mix and to colophony were determined. In all fragrance mix-allergic patients, the frequency of positive reactions to colophony was sought. Among fragrance mix-allergic patients who were tested to the constituents of the fragrance mix, the frequency of positive reactions to colophony was compared in patients who had positive reactions to oak moss absolute and in those who did not.

Results

Of 25,395 patients tested to the European standard

Table 1. Patch test results with oak moss absolute (1% pet.) and colophony (20% pet., both by Hermal) in 1203 patients tested to the constituents of the fragrance mix between 1984 and 2000

Colophony	Oak moss absolute			% positive to oak moss
	Positive patch test	Negative patch test	Sum	
Positive patch test	73	115	188	38.8%
Negative patch test	269	746	1015	26.5%
Sum	342	861	1203	28.4%
% positive to colophony	21.3%	13.4%	15.6%	

series, 1,963 (7.7%) were allergic to the fragrance mix and 1,210 (4.8%) were allergic to colophony. 343 (17%) of those positive to the fragrance mix were allergic to colophony, confirming it as a marker for fragrance allergy. 1,203 patients were tested to the constituents of the fragrance mix. 342 of these were allergic to oak moss absolute. There was a highly statistically significant association between allergy to oak moss absolute and allergy to colophony, 73 (21.3%) of 342 oak moss-positive patients being allergic to colophony versus 115 (13.4%) of 861 oak moss-negative patients ($p = 0.0002$, Fisher's exact test) (Table 1).

Discussion

Oak moss absolute is prepared from a lichen, *Evernia prunastri*, which grows on oak trees. Tree moss absolute is composed of a mixture of lichens, mainly *Parmelia furfuracea*, which grow on pine species. Both oak moss and tree moss are harvested from bark, mainly in Eastern European countries, to be sold to fragrance chemical suppliers. Tree moss often contains pieces of bark and twig, which introduce resin acids to it. Tree moss is more widespread in nature than oak moss and much cheaper. As oak moss and tree moss have a similar scent, they are frequently mixed by the harvester or supplier to reduce costs (Dr T Schumacher, Hermal, personal communication). In addition, accidental contamination by tree moss may occur during the oak moss harvesting process.

We, too, found an association between allergy to oak moss and colophony. This is probably due to the presence of contaminating resin acids (abietic, dehydroabietic and 7-oxo-dehydroabietic acids) in the oak moss absolute patch test material that we used during the period 1984–2000. In patients attending our institute, 8% more reactions to colophony (21.3% versus 13.4%) were found among fragrance mix-allergic individuals who were allergic to oak moss than among those who were not. Our large retrospective study could not confirm the magnitude of the association reported by Lepoittevin et al. (2). This is likely to be due to skewing of his results by a very small sample size ($n = 17$). In addition, if his patients selected on the

basis of colophony allergy had very strongly positive reactions, small amounts of resin acids in oak moss and tree moss might be more likely to elicit a positive reaction in them. Our results are in keeping with those of Uter et al. (3) who also showed a substantial degree of association between allergy to oak moss and to colophony, but of a much smaller magnitude than indicated by the study of Lepoittevin et al. (2).

Hermal confirmed that they had found contaminating resin acids in their oak moss absolute patch test material subsequent to Lepoittevin et al.'s study (2), and that they have changed their supplier to one who guarantees pure oak moss and whose samples consistently test negative for abietic acid at a detection limit of 0.1%. In April 2000, the International Fragrance Research Association (IFRA) changed their guidelines on oak moss extracts used in consumer products, stating that they must be free of tree moss extracts. If suppliers do not adhere to the guidelines, and oak moss supplied to the perfume industry remains a mixture, sensitization to resin acids will still occur in users of fragranced cosmetic products. Thus 'impure' oak moss patch test material may be more representative of relevant exposure to sensitizers in cosmetics.

References

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