

- CONTRIBUTIONS TO THIS SECTION MAY NOT UNDERGO PEER REVIEW, BUT WILL BE REVIEWED BY THE EDITOR •

Allergic contact dermatitis resulting from multiple colophonium-related allergen sources

Lien Vandebuerie¹, Carolien Aerts² and An Goossens¹

¹Department of Dermatology, University Hospitals Sint-Raphael – KU Leuven, Leuven, B-3000, Belgium and ²Grimbergen, B-1850, Belgium

doi:10.1111/cod.12144

Key words: adhesive tape; allergic contact dermatitis; colophonium; double bass; depilating wax; fragrance; Meranti wood; musician; *Myroxylon pereirae* resin; phenol formaldehyde resin 2; rosin; shoes.

Contact allergy to colophonium is a common finding in patch test clinics, although identifying a relevant sensitizing source is not always easy, because, together with its derivatives, it is so widely used (1). We present here the case of a patient with several exacerbations of severe allergic contact dermatitis resulting from multiple colophonium-containing or colophonium-related allergen sources.

Case Report

A 22-year-old non-atopic woman was referred in November 2012 to our Contact Allergy Unit by her dermatologist (C.A.) for patch testing, because of a history of severely itching, eczematous to vesicular, sharply demarcated lesions at different locations and on different occasions.

The patient mentioned that she had been allergic to fragrance-containing products, jewellery and adhesive tape since childhood; a pair of shoes had caused eczematous reactions on the lateral sides of the feet; she had developed an acute eczema after waxing her legs with depilating strips; and a vesicular eruption on the upper arm, which she had developed some time before consulting her dermatologist, was attributed to contact with a garage door made of Meranti wood that was leaking a resinous substance. Finally, she had developed an eczematous dermatitis on the eyelids, cheeks and all fingers of the right hand (mostly pronounced on the ring finger), in relation to double bass playing and holding the bow (using the French bow grip). Despite this, patch testing had never been performed.

Correspondence: An Goossens, Department of Dermatology, University Hospitals St-Raphael, KU Leuven, Kapucijnenvoer 33, B-3000 Leuven, Belgium. Tel: +32 16 33 78 70; Fax: +32 16 33 78 72. E-mail: an.goossens@uzleuven.be

Conflicts of interest: The authors have declared no conflicts.

Table 1. Positive patch test results

Allergens	D2	D4
Colophonium	++	++
Phenol formaldehyde resin 2, 1%*	–	+
Fragrance mix I	+	+
Fragrance mix II	+	++
Limonene hydroperoxide, 0.3%	+	++
Linalool hydroperoxide, 1%	+	++
<i>Myroxylon pereirae</i> resin	–	+?
Eugenol	+	+
Compositae mix, 5%	–	+
Nickel	–	+
Instrument wax [†]	++	++
Garage-door wax [†]	++	++

*Tested in the context of a European Environmental Contact Dermatitis Research Group study.

[†]All allergens diluted in pet., except: as is, semi-open.

Each time, the skin lesions had responded well to treatment with topical corticosteroids, but did recur.

Patch tests were performed with the baseline series (Trolab, Hermal, Reinbek, Germany), as well as with the products brought in by the patient, with Van der Bend patch test chambers (Van der Bend, Brielle, The Netherlands), applied on the back with Micropore™ (3M Health Care, Borken, Germany), and additionally fixed with Mefix® (Mölnlycke Health Care, Göteborg, Sweden). The positive results are shown in Table 1 and Figs. 1 and 2.

Discussion

Colophonium, also called colophony in Europe and rosin in North America, is a complex mixture of >100 compounds derived from pine trees. Its exact constituents are difficult to pinpoint, as they vary with climate, type of pine tree from which the colophonium

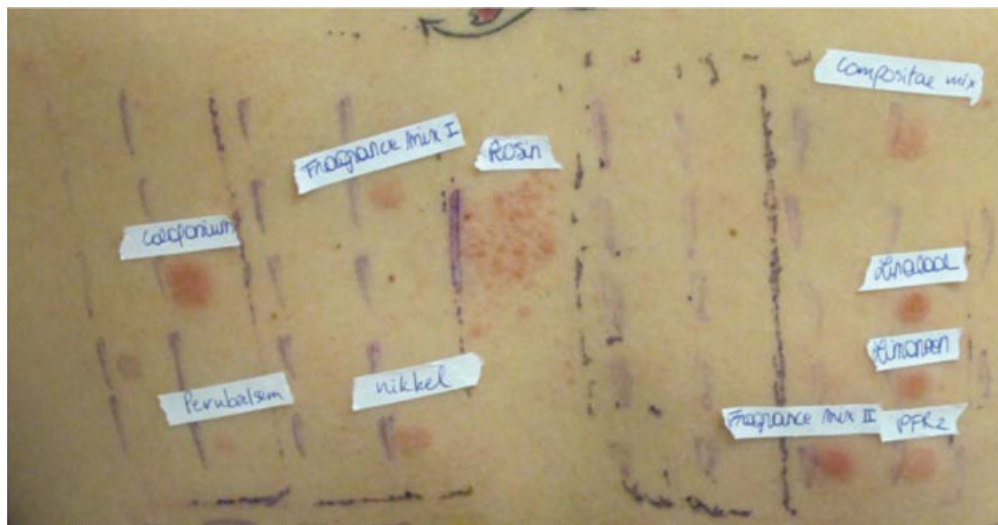


Fig. 1. Positive reactions to colophonium, *Myroxylon pereirae*, fragrance mix I, nickel, rosin for the instrument, fragrance mix II, Compositae mix, linalool and limonen hydroperoxides, and phenol formaldehyde resin 2 (PFR2).

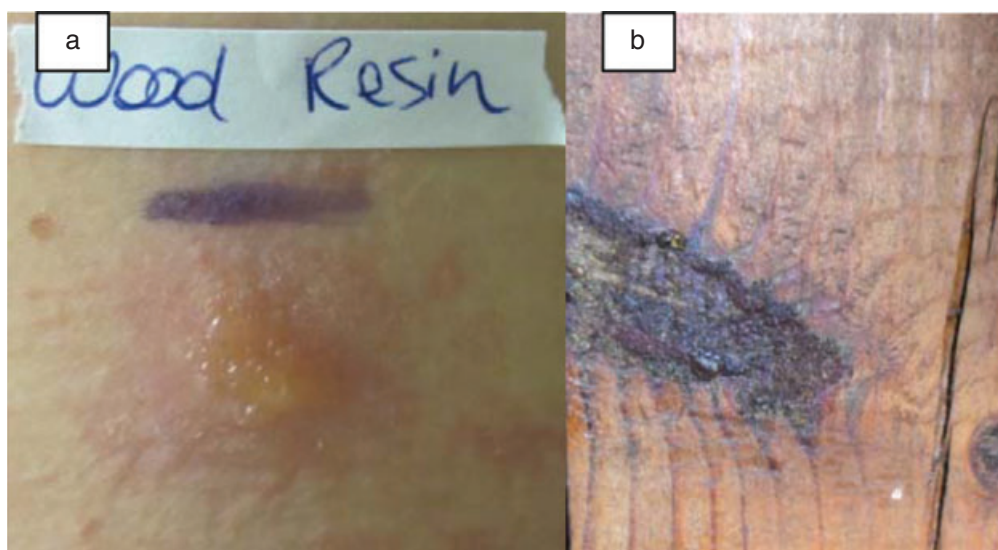


Fig. 2. Positive reactions to the wood resin leaking from the Meranti garage door.

is derived, and extraction and storage methods (1). It is a mixture of ~90% resin acids and 10% neutral fraction, consisting of terpenes, sesquiterpenes, terpene alcohols, aldehydes, etc. The resin acids can be divided into abietic types (abietic, palustric, levopimaric and dehydroabietic acids) and pimaric types (pimaric, isopimaric and sandarapimaric acids), the former being characterized by a double conjugated bond that is missing in the latter. Pure resin acids are not allergenic; however, they are readily prone to oxidation in the atmosphere (auto-oxidation), forming the allergenic oxidized culprits (1, 2).

Apart from nickel, all positive patch test reactions observed in this case are related to colophonium contact allergy, that is, adhesive tape, depilating wax strips (3), 'rosin' used for double bass playing (4–6), and the shoes, in which colophonium can be used as a tackifying agent or for leather treatment (7). These products, together with phenol formaldehyde resin (also known as a shoe allergen) may also cross react with fragrance allergens (8). Positive patch test reactions to colophonium are also linked to allergic contact dermatitis caused by fragrances, *Myroxylon pereirae*, Compositae mix, and essential oils, the

common chemical structures being (oxidized) terpenes (9); this may also explain the patient's reactions to limonene and linalool hydroperoxides. A similar case was previously described (4). Even the acute vesicular eczematous reaction on the upper arm following contact with the resinous material that leaked from the Meranti wood (genus *Shorea*; family Dipterocarpaceae) of the garage door is most probably related to colophonium, as this wood contains sesquiterpenes in its most important essential oils (10).

The patient was told to avoid all colophonium sensitization sources, and to replace the 'rosin' with the 'hypoallergenic' Super-Sensitive Clarity[®] rosin (Musical String Co., Sarasota, FL, USA), which is available for all bowed string instruments and is made from a synthetic hydrocarbon resin compound.

Recently, the patient was contacted again by telephone, and she had remained completely free of dermatitis since avoiding contact with all colophonium-containing materials.

References

- Downs A, Sansom J. Colophony allergy: a review. *Contact Dermatitis* 1999; **41**: 305–310.
- Gäfvert E, Shao L P, Karlberg A-T et al. Contact allergy to resin acid hydroperoxides. Hapten binding via free radicals and epoxides. *Chem Res Toxicol* 1994; **7**: 260–266.
- Goossens A, Milpied-Homsi B, Le Coz C. An epidemic of allergic contact dermatitis from epilating products. *Contact Dermatitis* 2001; **45**: 360 (Letter to the Editor).
- Murphy J, Clark C, Kenicer K, Green C. Allergic contact dermatitis from colophony and Compositae in a violinist. *Contact Dermatitis* 1999; **40**: 334.
- Alvarez M S, Braccaccio R R. Multiple contact allergens in a violinist. *Contact Dermatitis* 2003; **49**: 43–44.
- Kuner N, Jappe U. Allergic contact dermatitis from colophonium, turpentine and ebony in a violinist presenting as fiddler's neck. *Contact Dermatitis* 2004; **50**: 258–259.
- Nardelli A, Taveirne M, Drieghe J et al. The relation between the localization of foot dermatitis and the causative allergens in shoes: a 13-year retrospective study. *Contact Dermatitis* 2005; **53**: 201–206.
- Bruze M. Simultaneous reactions to phenol-formaldehyde resins: colophonium, hydroabietyl alcohol, balsam of Peru, perfume mixture. *Contact Dermatitis* 1986; **14**: 119–120.
- Paulsen E, Andersen K E. Colophonium and Compositae mix as markers of fragrance allergy: cross-reactivity between fragrance terpenes, colophonium and Compositae plant extracts. *Contact Dermatitis* 2005; **53**: 285–291.
- Kaur S, Daval R, Varschnev V K et al. GC-MS analysis of essential oils of heartwood and resin of *Shorea robusta*. *Planta Med* 2011; **67**: 883–886.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.