

# Contact dermatitis caused by a footwear label with a positive patch test reaction to 2-monomethylol phenol

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doi:10.1111/cod.12254

**Key words:** 2-monomethylol phenol; contact allergic dermatitis; patch test; trainers label.

## Case

A 42-year-old woman presented with a 3-month history of a symmetrical rash on the dorsa of her feet that had appeared in the summer when she started wearing new exercise trainers. She had no history of eczema or allergies. On examination, she had well-demarcated square eczematous plaques corresponding to the areas of contact with the plastic labels on the tongues of her footwear.

She was patch tested using Finn Chambers® (8 mm; Smart Practice, Phoenix, AZ, USA) on Scanpor® tape (Norgesplaster A/S, Vennesla, Norway) and tested with the extended British baseline series of the allergens (Chemotechnique®, Vellinge, Sweden), plastics and glue series and one of the labels (Fig. 1), with positive findings on D2 and D4 as shown in Table 1.

One of the labels was sent to the manufacturers, Nike®, for ingredient information. The manufacturers confirmed that the label contained 'phenolic resins' (Table 2).

## Discussion

Phenol formaldehyde resins are synthetic polymers, and are widely used as coatings and adhesives, especially in wood laminates and electrical circuit boards/insulation. Adverse reactions to these substances have previously been described (1). The synthesis of phenol formaldehyde resins involves heating the constituents (phenol and formaldehyde) in the presence of a catalyst. The initial reaction produces monomethylol phenols. Further heating continues the condensation reactions, resulting



**Fig. 1.** Results of patch testing with the Nike® label, showing a ++ positive reaction on D4.

**Table 1.** Patch test results

|                       | D2  | D4  |
|-----------------------|-----|-----|
| Nickel                | ++  | ++  |
| Trainer label         | +++ | +++ |
| 2-Monomethylol phenol | ?+  | ++  |

GMA, glycidyl methacrylate; HDDA, 1,6-hexanediol diacrylate.

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*Conflict of interest:* The authors declare no conflict of interests.  
*Funding source:* None.

**Table 2.** Ingredients/identity information found on trainers label

| Predominant compound       | %     |
|----------------------------|-------|
| Polyethylene terephthalate | 73–76 |
| Phenolic resin             | 5–8   |
| Polyester resin            | 1–3   |
| Polyurethane resin         | 1–3   |
| Polyethylene wax           | 3–6   |
| Stearamide                 | 2–4   |
| Carnauba wax               | 1–3   |
| Calcium carbonate          | 1–2   |
| Carbon black               | 4–6   |

in the resin curing. The low molecular weight phenol 2-monomethylol phenol has been shown to be a potent sensitizer, with stronger sensitizing capacities than

4-methylol phenol and 2,4,6-trimethylol phenol (2, 3). It is also known as saligenin or salicyl alcohol, and occurs naturally as a glycoside (salicilin) in the bark of willow and poplar. It has been reported that uncured low molecular weight intermediates persist in the final product, despite the curing process (4).

To our knowledge, this is the first case report of sensitization to phenolic resins in a cured clothing label. As we were only provided with broad information by the manufacturer, we can only speculate that 2-monomethylol phenol is contained in the 5–8% phenolic resin ingredient of the footwear label. This case report highlights an unusual source of consumer exposure to low molecular weight phenolic resins.

## References

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