

pile, rolling up the individual wrap and tying on a label which listed both the ingredients as well as the price (Figure 1). We hypothesize that as multiple wraps were regularly being rolled by hand there was likely to be direct transfer of colophonium from the hands to the skin on the face and eyelids, however, there was also the potential for air-borne exposure. The patient has denied any form of hand eczema this is most likely because the skin on the hands is thicker than the face and eyelid; it is likely if she has continued to handle the beeswax wrap; that she would have developed ACD on her hands as well.

DISCUSSION

Bees wax wraps are increasingly popular products used as a sustainable multi-use alternative to tin foil/cling film for wrapping and covering foods. They can be bought from eco-friendly retail shops and online sites. They can also be handmade with many popular internet sites displaying videos for how to make these items at home.

Colophonium (rosin) is the sticky sap produced by pine and spruce trees. It is used in a wide range of home and occupational products, most classically sticking plasters, cosmetics, waxes, polishes and paper products. Colophonium, in the form of pine resin, is often added to bees wax wraps to increase their adhesive properties.

Occupational colophonium ACD is most commonly associated with the wood industry, glues, metal working fluids and soldering materials.¹ Our patient is likely to have developed her colophonium ACD through regular contact with pine resin from the bees wax wraps

in her occupational setting. It is likely however that other patients may be similarly exposed in a home setting if making and using the wraps on a regular basis.

We present this case to raise awareness of bees wax wraps as a new potential eco-friendly source of colophonium ACD.

AUTHOR CONTRIBUTIONS

Iman Hamid: Writing – original draft; writing – review and editing.

Natalie Stone: Writing – review and editing; supervision.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

ORCID

Iman Hamid  <https://orcid.org/0000-0003-4922-2280>

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2,4,6-Tris(dimethylaminomethyl)phenol: The allergen which came in from the cold

Johannes Geier¹  | Heinrich Dickel²  | Claudia Schröder-Kraft^{3,4} | Michal Gina⁵  |
Dagmar Simon⁶  | Elke Weisshaar⁷  | Claudia Lang⁸  | Richard Brans^{3,9}  |
Andrea Bauer¹⁰  | Harald Löffler¹¹  | Steffen Schubert¹  | for the IVDK

¹Information Network of Departments of Dermatology (IVDK), Institute at the University Medical Center Göttingen, Göttingen, Germany

²Department of Dermatology, Venereology and Allergology, St. Josef Hospital, University Medical Center, Ruhr University Bochum, Bochum, Germany

³Institute for Interdisciplinary Dermatologic Prevention and Rehabilitation (iDerm) at the University of Osnabrück, Osnabrück, Germany

⁴Dermatologic Center, BG Klinikum Hamburg, Hamburg, Germany

⁵Institute for Prevention and Occupational Medicine of the German Social Accident Insurance, Institute of the Ruhr University Bochum (IPA), Bochum, Germany

⁶Department of Dermatology, Inselspital, Bern University Hospital, University of Bern, Bern, Switzerland

⁷Occupational Dermatology, Department of Dermatology, Ruprecht-Karls University Heidelberg, Heidelberg, Germany

⁸Department of Dermatology, University Hospital Zurich, Zurich, Switzerland

⁹Department of Dermatology, Environmental Medicine, and Health Theory, University of Osnabrück, Osnabrück, Germany

¹⁰Department of Dermatology, University Allergy Center, University Hospital Carl Gustav Carus, Technical University Dresden, Dresden, Germany

¹¹Department of Dermatology, SLK Hospital Heilbronn, Heilbronn, Germany

Correspondence

Johannes Geier, IVDK—Information Network of Departments of Dermatology, Institute at the University Medical Center Göttingen, Geiststr. 3, 37073 Göttingen, Germany.

Email: jgeier@gwdg.de

KEYWORDS: 2,4,6-Tris(dimethylaminomethyl)phenol, CAS 90-72-2, epoxy resin, patch testing, tris-DMP

2,4,6-Tris(dimethylaminomethyl)phenol (tris-DMP; CAS No. 90-72-2) is a hardener/accelerator frequently used in epoxy resin systems (ERS), especially at low ambient temperature.¹ First cases of contact sensitization to tris-DMP have been observed at the Finnish Institute of Occupational Health (FIOH) around 1990.² Since then, contact sensitization to tris-DMP has been described in several case reports from various European countries.¹ In the FIOH, 14 cases of contact sensitization to tris-DMP have been registered from 1991 to 2013, rendering it the second most frequent sensitizer among epoxy resin hardeners.¹ Since 2016, tris-DMP is available as patch test preparation at 0.5% in pet. from Chemotechnique, Vellinge, Sweden.

METHODS

The German Contact Dermatitis Research Group (DKG) included tris-DMP in the 'adhesives and glues' series and the 'building trade' series in October 2016. Tris-DMP 0.5% pet. has been patch tested following DKG guidelines³ in the departments of dermatology joining the Information Network of Departments of Dermatology (IVDK) in 5467 patients in the years 2017–2021. Results of these tests were retrospectively analysed.

RESULTS

Patch test results are shown in Table 1. Positive reactions to tris-DMP occurred in 28 patients (0.5%). Seven positive reactions (25%) would have been missed if patch tests would have been read until Day 3 (D3) only. In six patients, positive reactions occurred at D4, and in one patient at D7. In two patients, a weak positive reaction (+) at D3 evolved into a strong positive reaction (++) at D4. Patch tests had been read until D4 or even D7 in 1964 patients (35.9%). Of the 28 tris-DMP-positive patients, 23 were males; the mean age was 47.0 years. Four of the tris-DMP positive patients were floor

layers, four construction workers or bricklayers, three tile setters, and three painters. Additional details about those sensitized to tris-DMP, compared to those with a negative tris-DMP patch test, can be found in Table S1. Of the 28 tris-DMP positive patients, 27 were or had previously been patch tested with epoxy resin based on bisphenol A diglycidyl ether (DGEBA). Of these, 23 (85.2%) reacted to the DGEBA resin. In all, concomitant sensitizations to other ERS components occurred in 26 of the 28 tris-DMP positive patients (Table S2). For comparison, in the study period, sensitization to *m*-xylylenediamine (MXDA) was diagnosed in 63 of 5978 tested patients (1.1%), and to isophorone diamine (IPDA) in 32 out of 6097 patients (0.5%).

DISCUSSION

Consistent with the FIOH data,¹ we found sensitizations to tris-DMP less frequently than sensitizations to MXDA, but with a similar frequency as sensitizations to IPDA. Sensitization to tris-DMP without sensitization to other ERS components occurred less, but not significantly, frequently than in the FIOH (IVDK: 2/28 pet.; FIOH: 3/14 pet). However, 9 out of 14 FIOH patients (64%) sensitized to tris-DMP, but only 3 of the 28 tris-DMP positive IVDK patients (11%), were painters. Among our tris-DMP sensitized patients, there were more floor layers, bricklayers, construction workers, and tile setters.

One quarter of the 28 positive reactions to tris-DMP in our study did not occur before D4. As only about one third of the patch tests have been read after D3, the true frequency of tris-DMP sensitization might have been higher. In the FIOH, late readings at D4, D5, or D6 had been done routinely,¹ suggesting that their (higher) reported frequency of sensitization (1.9%) may be more realistic. However, it should be considered that far more occupational dermatitis patients are patch tested in the FIOH than in the IVDK,¹ which may explain the higher proportion of positive reactions.

According to information from ERS formulators, tris-DMP is used at higher concentrations in ERS designed for colder ambient temperatures. Thus, it may be that the products used by the Central European patients patch tested in the IVDK contained less tris-DMP than the products used by the Finnish patients tested in the FIOH. Unfortunately, this is not always evident from the safety data sheets, since usually no specific concentration, but rather a concentration range, is declared for tris-DMP.

Summing up, we can confirm that tris-DMP is a relevant sensitizer in ERS. In order not to miss cases of sensitization, late readings at D4 and D7 should be done when patch testing with tris-DMP.

AUTHOR CONTRIBUTIONS

Johannes Geier: Conceptualization; investigation; writing – original draft. **Heinrich Dickel:** Validation; writing – review and editing.

TABLE 1 IVDK, 2017–2021, patch test reactions to tris-DMP 0.5% in pet.

Reaction	Day 3		Day 3, 4 or 7	
	Count	Percent	Count	Percent
Negative	5412	99.0	5408	98.9
Doubtful	28	0.5	25	0.5
+	11	0.2	15	0.3
++	7	0.1	10	0.2
+++	3	0.1	3	0.1
Irritant	6	0.1	6	0.1
Total	5467	100.0	5467	100.0

Abbreviation: Information Network of Departments of Dermatology.

Claudia Schröder-Kraft: Validation; writing – review and editing. **Michal Gina:** Validation; visualization; writing – review and editing. **Dagmar Simon:** Validation; writing – review and editing. **Elke Weisshaar:** Validation; writing – review and editing. **Claudia Lang:** Validation; writing – review and editing. **Richard Brans:** Validation; writing – review and editing. **Andrea Bauer:** Validation; writing – review and editing. **Harald Löffler:** Validation; writing – review and editing. **Steffen Schubert:** Validation; writing – review and editing; supervision; data curation.

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ORCID

Johannes Geier  <https://orcid.org/0000-0002-5047-8948>

Heinrich Dickel  <https://orcid.org/0000-0001-6837-4402>

Michal Gina  <https://orcid.org/0000-0003-2871-3232>

Dagmar Simon  <https://orcid.org/0000-0001-8965-9407>

Elke Weisshaar  <https://orcid.org/0000-0002-7016-0224>

Claudia Lang  <https://orcid.org/0000-0003-0469-7661>

Richard Brans  <https://orcid.org/0000-0002-1245-024X>

Andrea Bauer  <https://orcid.org/0000-0002-4411-3088>

Harald Löffler  <https://orcid.org/0000-0002-2017-8469>

Steffen Schubert  <https://orcid.org/0000-0002-2359-2518>

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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A case of fixed drug eruption from cetirizine with cross-reaction to levocetirizine and hydroxyzine

Ana Sofia Pereira¹  | Duarte Flor¹ | Margarida Gonçalo^{1,2} 

¹Department of Dermatology, Coimbra University Hospital, Coimbra, Portugal

²Faculty of Medicine, University of Coimbra, Coimbra, Portugal

Correspondence

Ana Sofia Pereira, Department of Dermatology, Coimbra University Hospital, Coimbra, Portugal.

Email: sfigpereira@gmail.com

KEYWORDS: case report, cetirizine, cutaneous adverse drug reaction, fixed drug eruption, hydroxyzine, levocetirizine, patch tests

Fixed drug eruption (FDE) is a cutaneous adverse drug reaction most frequently caused by non-steroidal anti-inflammatory drugs (NSAIDs), antibiotics, anticonvulsants, or paracetamol.¹ Uncommonly, cetirizine and other H1 antihistamines have also been implicated in FDE.^{2,3} We report a case of cetirizine-induced FDE with cross-reaction with other piperazine derivatives confirmed by patch test.

CASE REPORT

An 18-year-old male with allergic rhinitis reported three episodes of multiple erythematous-violaceous oval plaques located on his

buttocks and proximal thighs. Lesions emerged repeatedly on the same areas and resolved within 8–10 days leaving greyish hyperpigmentation. Both clinic and histopathology were typical of FDE. The most recent episode occurred within 24 h after taking a 20 mg cetirizine tablet. The two previous episodes were possibly related with ibuprofen used for muscular pain, but the patient could not exclude exposure to H1-antihistamines used occasionally for allergic rhinitis. He denied other current or prior medications.

Two months after the acute episode, patch tests were performed on non-lesional skin of the back with the European Baseline series and a series of NSAIDs and anti-H1, and on residual pigmented lesions with