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Allergic contact dermatitis to phenoxyethanol: A rare, but possible cause of hand dermatitis

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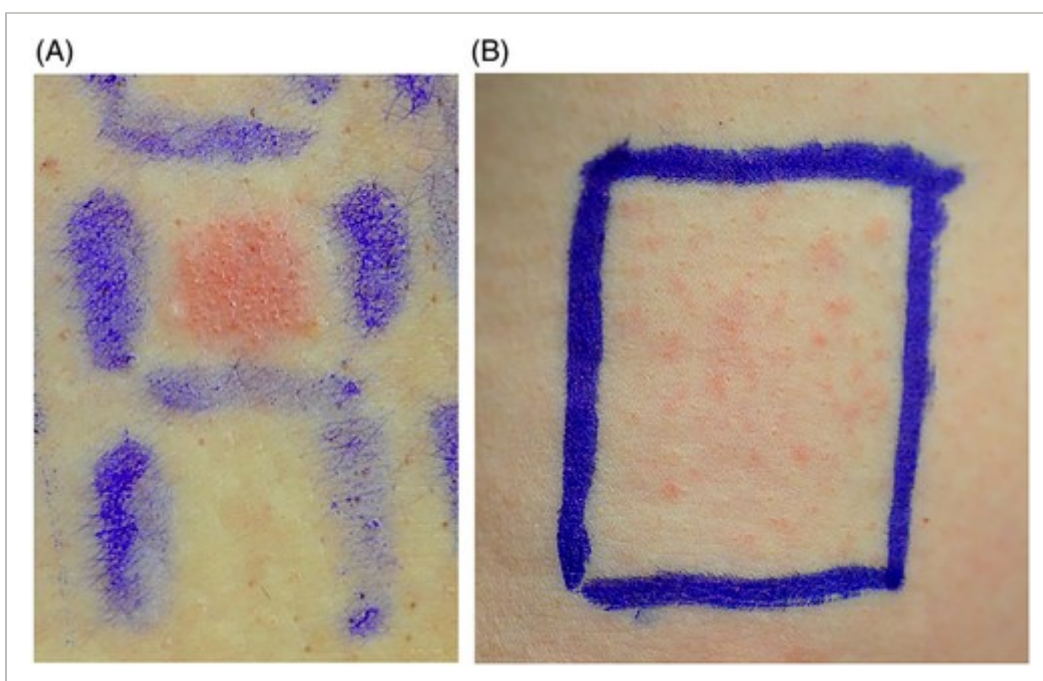
Phenoxyethanol (PE; Syn. 2-Phenyoxethanol; CAS no. 122-99-6) is one of the most commonly used preservatives in cosmetics and is also found in industrial products, including metalworking fluids. It is considered to have a low sensitization potential.¹⁻³

CASE REPORT

A 59-year-old male toolmaker presented with therapy-resistant, 1-year lasting hand dermatitis suspected to be of occupational origin. Despite being on work leave and treatment with alitretinoin for the past 5 months, severe dermatitis of hands and lower arms was observed (Figure 1). We performed patch tests and readings according to the guidelines of the German Contact Dermatitis Research Group (DKG)⁴ using the DKG baseline series; the DKG series for topical preparations, preservatives, rubber, disinfectants, acrylates, industrial biocides, and metalworking fluids; and the patient's own metalworking fluid. Patch tests were removed at day (D) 2 with the exception of the metalworking fluid, which was removed already at D1 and reactions were evaluated at D2, D3, D4, and D7. Solely, a 2+ reaction to PE 1% pet. (SmartPractice, Greven, Germany) from D2 to D7 was noted (Figure 2A). PE was not found in any of the available safety datasheets of the patient's workplace products, including the metalworking fluid. However, according to the product labels, it was an ingredient of the patient's skin care products "Eucerin UreaRepair PLUS 5% Hand Creme" and "Nivea 3IN1 Repair Hand Creme" (both from Beiersdorf AG, Hamburg, Germany), which he had regularly applied on his hands and lower arms after the onset of dermatitis. Repeated open application test (ROAT) with "Eucerin UreaRepair PLUS 5% Hand Creme," two times daily for 6 days on the inner sides of the patient's upper arm resulted in a positive reaction (Figure 2B). Dermatitis of hands and lower arms improved significantly after avoidance of these skin care products, indicating clinical relevance of the sensitization to PE as the contributing factor to the initially occupational irritant contact dermatitis.

**FIGURE 1**[Open in figure viewer](#)[↓ PowerPoint](#)

Hand dermatitis of the patient sensitized to phenoxyethanol

**FIGURE 2**[Open in figure viewer](#)[↓ PowerPoint](#)

(A) Positive patch test reaction to phenoxyethanol 1% pet. on day 3 and (B) positive repeated open application test to "Eucerin UreaRepair PLUS 5% Hand Creme" (upper arm) on day 6 of application

DISCUSSION

Despite its widespread use as preservative in cosmetic and pharmaceutical products as well as for other applications, only very few cases of allergic contact dermatitis and contact urticaria to PE have been reported.^{2, 5-7} Accordingly, a retrospective study of the Information Network of Departments of Dermatology (IVDK) revealed a very low sensitization rate of 0.24% among 6932 individuals patch tested in Germany, Austria, and Switzerland between 1996 and 2009.¹ Similarly, in 681 cutting metalworkers patch tested with the DKG metalworking fluids series in IVDK centres from 2010 to 2018, sensitization to PE was rarely observed (0.3%).⁸

Although rare, allergic contact dermatitis to PE should be considered and if undiscovered may lead to longstanding disease and inefficient treatments. The present case illustrates the importance of performing early patch tests to avoid delays in diagnosis and prevention measures. Diagnostic workup of patients with suspected occupational hand dermatitis should include patch testing and in doubtful cases also ROAT with patient's own skin care products.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

Michaela Kolodziej: Conceptualization (equal); investigation (equal); writing – original draft (equal); writing – review and editing (equal). **Alexander Kiewert:** Investigation (supporting); writing – review and editing (equal). **Christoph Skudlik:** Investigation (supporting); writing – review and editing (equal). **Richard Brans:** Conceptualization (equal); investigation (equal); supervision (lead); writing – original draft (equal); writing – review and editing (equal).

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