

DIMETHYL FUMARATE (A NOVEL POTENT CONTACT SENSITIZER) IN SHOES. ANALYTICAL METHOD PROPOSED FOR ITS MONITORING



Lo Balbo A., Gotelli M.J. and Gotelli C.
Centro de Investigaciones Toxicológicas S.A.
Juan B. Alberdi 2986 - 1406 Buenos Aires - ARGENTINA
Emergencias (24 Hs) +54 11 4643 - 1100 Consultas@ciquime.org.ar
www.ciquime.org.ar

INTRODUCTION

epidemic of severe contact dermatitis cases related to newly acquired shoes has
hold in Argentina.

ected patients and to identify the cause.

ients with contact dermatitis related to newly purchased pairs of shoes were studied.
analysed by gas chromatography-mass spectrometry. Compounds were identified
brary and semiquantitatively measured. Contact tests were performed with leather
and in the analysis.

the Asian shoes dermatitis epidemic is caused by contact allergy to a strange
ate (DMF) is a fungicide used by manufacturers during transportation of imported
theast Asia, in order to prevent fungal proliferation which can be caused due to
s like high wet and intense rainy seasons so typical in that part of the world.

CLINICAL REPORTS

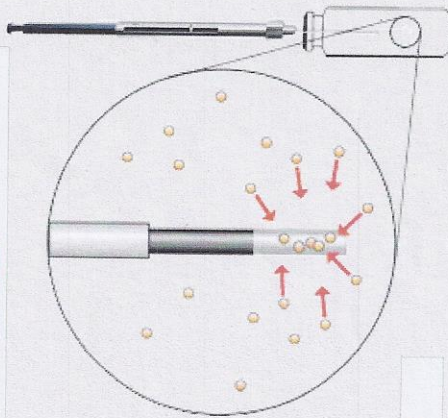
The patients showed erythematous lesions in both feet
soles with defined borders, fissures and clinical
symptomatology of pruritus and skin scaling.

Treatment: topical corticosteroids

PRIMARY SKIN IRRITATION

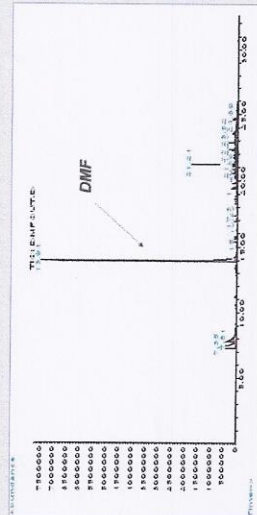
Severe erythema (beet redness) and severe edema
were observed after 24 and 72 Hs in rabbits. Under the
conditions of this study, the test article would be
considered a primary irritation of the skin.

SAMPLES ANALYSED

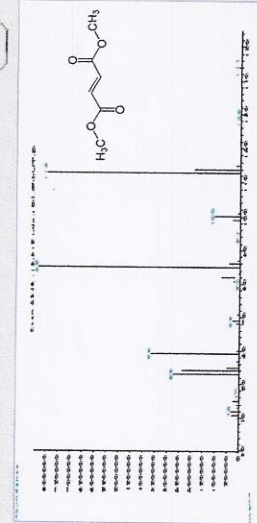


Samples, cut in small portions were heated in gas-tight ampoules
at 80°C for 30 min. Using a static headspace technique, the
gaseous phase was extracted in a 75µm Carboxen™-PDMS fiber
and then analysed by gas chromatography-mass spectrometry.

CHROMATOGRAPHY



HS-SPME-GC-MSD chromatogram of shoe matrix



MS Library report of peak TR= 13.91min

CONCLUSIONS

- ✗ Contact dermatitis is a localized rash or irritation of the skin caused by contact with a strange substance.
- ✗ An analytical method was developed in order to get a fast identification of the chemical sensitizer. DMF was revealed as the likely cause of the current footwear dermatitis epidemic.
- ✗ This method is simple and will rapidly indicate whether the product presents a risk for the customer.
- ✗ After finding the cause and stopping the allergen exposure, the dermatitis subsided in a few weeks with topical corticosteroid treatment in four patients.
- ✗ EC DECISION of 17 March 2009 "... to ensure that products containing the biocide DMF are not placed or made available on the market ..."