

Centre Hospitalier Universitaire de Montréal,
Montréal, QC, Canada

Key words: allergic contact cheilitis; D & C Yellow 11; lip balm.

In the USA, D & C Yellow 11 is approved by the Food and Drug Administration in drugs and cosmetics for external use only. Since 1973, a small number of case reports have described allergic contact dermatitis from this dye, but none has appeared in the English literature for more than a decade. Herein, we describe a case of sensitization to D & C Yellow 11 present in a lip cosmetic.

Case Report

A 38-year-old woman complained of recurrent desquamation, redness, and swelling of the lips. Over a period of 2 years, she used numerous lip balms, topical corticosteroids, and calcineurin inhibitor ointments, with minimal relief.

She was patch tested to the North American Contact Dermatitis Group standard series, to a comprehensive vehicles and cosmetics series, and to a bakers' series (all allergens provided by Chemotechnique Diagnostics, Vellinge, Sweden). In addition, she was also tested to four of her own lip cosmetics. Allergens were applied on Finn Chambers[®] (Epitest Ltd Oy, Tuusula, Finland) and on IQ Ultra[®] Chambers (Chemotechnique Diagnostics). Readings were performed at D2 and D4 and interpreted according to International Contact Dermatitis Research Group standards.

The patient's only reactions (+ on D2 and D4) were to two lip balms from the same manufacturer (Dans un Jardin[™], Dans Un Jardin, Paris, France) who provided their individual ingredients. When tested to the colouring agent D & C Yellow 11 (0.0016% pet.), present in both lip balms.

Discussion

D & C Yellow 11 (CI 47000) is also known as Solvent Yellow 33 or Quinoline Yellow SS. Its synthesis involves condensation of quinaldine with phthalic anhydride (1), yielding an oil-soluble quinoline dye called 2-(2-quinolyl)-1,3-indandione (CAS 8003-22-3) (Fig. 1). It has been used in a variety of cosmetics including lipsticks, fragrances, soaps, bath and

Allergic contact cheilitis from D & C Yellow 11

Contact Dermatitis 2009; 60: 294–295

Denis Sasseville¹ and Valérie Joncas²

¹Division of Dermatology, McGill University Health Centre, and ²Service de Dermatologie,

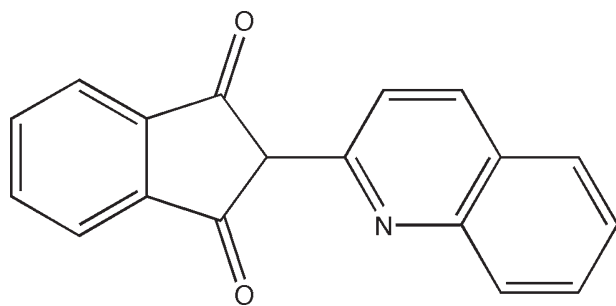


Fig. 1. Chemical formula of D & C Yellow 11 (CAS no. 8003-22-3).

body oils, facial moisturizers, eye shadows, and nail and hair cosmetics.

One publication described allergic contact dermatitis from occupational exposure in an explosive factory (2). In every other reported case, sensitization occurred from contact with cosmetics, namely face and neck dermatitis from colour cosmetics (3, 4), lipsticks (5), eye cream (6), hair care products (7), and toilet bar soap (8).

In some of these patients, the dermatitis was very severe and required treatment with systemic corticosteroids. One patient became sensitized by patch testing with D & C Yellow 11 diluted 1% in polyethylene glycol. This patient was so sensitive that, when later retested, he reacted to dilutions down to 0.00001% (1, 9).

D & C Yellow 11 was found to be a potent sensitizer in the guinea-pig (10–12). In a human repeat insult patch test, sensitization occurred in 14 of 56 subjects tested with a concentration of 20% in pet. (13); a concentration of 0.5% in pet. sensitized 15 of 20 subjects submitted to the maximization test (14). Our patient became sensitized from exposure to cosmetics that contained D & C Yellow in the range of 10–20 p.p.m., thus confirming the strong allergenic potential of this dye, especially if applied to damaged skin.

References

1. Björkner B, Niklasson B. Contact allergic reaction to D & C Yellow No. 11 and Quinoline Yellow. *Contact Dermatitis* 1983; 9: 263–268.
2. Noster U, Hausen B M. Berufsbedingtes Kontaktekzem durch gelben Chinophthalonfarbstoff (Solvent Yellow 33: C.I. 47000). *Der Hautarzt* 1978; 29: 153–157.
3. Larsen W G. Cosmetic dermatitis due to a dye (D and C Yellow # 11). *Contact Dermatitis* 1975; 1: 61.
4. Calnan C D. Quinazoline Yellow SS in cosmetics. *Contact Dermatitis* 1976; 2: 160–166.
5. Calnan C D. F D & C Yellow 11 in lipstick. *Contact Dermatitis* 1975; 1: 121.
6. Calnan C D. Quinazoline yellow dermatitis (D & C Yellow 11) in an eye cream. *Contact Dermatitis* 1981; 7: 271.
7. Monk B. Allergic contact dermatitis to D & C Yellow 11 in a hair cream. *Contact Dermatitis* 1987; 17: 57–58.
8. Jordan W P Jr. Contact Dermatitis from D & C yellow 11 dye in a toilet bar soap. *J Am Acad Dermatol* 1981; 4: 613–614.
9. Björkner B, Magnusson B. Patch test sensitization to D & C Yellow No. 11 and simultaneous reaction to Quinoline Yellow. *Contact Dermatitis* 1981; 7: 1–4.
10. Lamson S A, Kong B M, De Salva S J. D & C Yellow Nos. 10 and 11: delayed contact hypersensitivity in the guinea pig. *Contact Dermatitis* 1982; 8: 200–203.
11. Palazzolo M J, DiPasquale L C. The sensitization potential of D & C Yellow No. 11 in guinea pigs. *Contact Dermatitis* 1983; 9: 367–371.
12. Sato Y, Kutsuna H, Kobayashi T, Mitsui T. D&C nos. 10 and 11: chemical composition analysis and delayed contact hypersensitivity testing in the guinea pig. *Contact Dermatitis* 1984; 10: 30–38.
13. Rapaport M J. Allergy to D and C yellow dye # 11. *Contact Dermatitis* 1980; 6: 364–365.
14. Kita S, Kobayashi T, Kutsuna H, Kligman A M. Human maximization testing of D&C Yellow no. 10 and Yellow no. 11. *Contact Dermatitis* 1984; 11: 210–213.

Address:

Dr Denis Sasseville, MD, FRCPC
Division of Dermatology
McGill University Health Centre
Royal Victoria Hospital
Room A4. 17
687 Pine Avenue West
Montréal, QC
Canada H3A 1A1
Tel: 514 934 1934 ext. 34648
Fax: 514 843 1570
e-mail: denis.sasseville@mcgill.ca