CONTACT POINTS

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Airborne contact dermatitis from *Eucalyptus pulverulenta* 'Baby Blue' in a florist

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Contact dermatitis from *Eucalyptus* oil has been documented previously (1–4), whereas contact dermatitis from *Eucalyptus* plants has been reported only a few times previously (5). The bark and wood have been reported to induce dermatitis and the leaves contact urticaria (5). Due to the scarcity of more recent reports, we find it of interest to present a case of occupational airborne allergic contact dermatitis from a popular ornamental *Eucalyptus* species, *Eucalyptus pulverulenta* 'Baby Blue'.

Case Report

A 52-year-old male florist was referred on suspicion of airborne contact allergy and plant dermatitis. For 3 days, he had had swelling, erythema, and itching of his face to a degree that made it impossible for him to sleep at night. On referral (D4), the swelling had subsided, but the patient still had severe facial eczema (Fig. 1). At presentation, the patient suspected that the cause of his problem was twigs of *E. pulverulenta* 'Baby Blue', which he had defoliated manually, using fabric gloves with rubber pads, on the day before the eczema appeared. He had developed similar, although less pronounced, attacks of facial dermatitis two to three times yearly during the previous 3–4 years.



Fig. 1. Facial eczema in a florist 4 days after exposure to *Eucalyptus pulverulenta* 'Baby Blue'.

During the 27 years, he had worked as a self-employed florist and had handled bundles of *Eucalyptus* twigs occasionally. He used to remove leaves from the lower part of the twigs with unprotected hands, and he described how this defoliation produced a strong, pleasant fragrance in his store and subsequently irritation in his eyes.

His past medical history included hand eczema for the past 10–12 years; at first, the eczema was localized to the palms, and later, it involved mainly the dorsal aspects of both hands and fingers. He had noticed flares of the hand eczema when he handled bulbous plants such as daffodils and tulips but never when he removed leaves from *Eucalyptus*. Patch testing 10 years previously did not detect any contact allergies. He had no atopic history, but for years, he had experienced short attacks of severe rhinoconjunctivitis of unknown cause but suspected some orchid species as being responsible for conjunctival irritation.

The patient was patch tested 4 weeks after the first visit with our baseline series and selected plant allergens as well as leaves of *E. pulverulenta* 'Baby Blue'. The test material was applied in Finn Chambers® (Epitest

Table 1. Positive and selected doubtful positive reactions in a florist tested with the European baseline series and selected plant allergens and materials

Allergen	Reading on D3	Reading on D7
Colophonium 1500 μg/cm^2	++	0
Fragrance mix 450 μg/cm^2	−	−
Fragrance mix 8% pet.	−	−
Compositae mix 6% pet.	0	−
(−)-α-Pinene 15% pet.	0	−
(+)-α-Pinene 15% pet.	0	−
p-Cymene 5% pet.	−	−
Citronellol 1% pet.	0	−
α-Phellandrene 5% pet.	−	−
Tuliposide A 0.01% pet.	++	+
Leaf topside *Eucalyptus pulverulenta* moistened with water	++	+ (ulceration)
Leaf underside *E. pulverulenta* moistened with water	++	+ (ulceration)
Leaf topside *E. pulverulenta* moistened with ethanol	++	+ (ulceration)
Leaf underside *E. pulverulenta* moistened with ethanol	++	+ (ulceration)
Jonquil/daffodil oleoresin 1:10 (w/v) alcohol	+	0 follicular

0, doubtful positive reaction.

Ltd Oy, Tuusula, Finland) on Scanpor® (Actavis Norway AS, Vennesla, Norway) for 2 days and readings made on D3 and D7. Within 24 hr, the patient noticed severe itching under the panel with *Eucalyptus* leaves and a flare of his facial dermatitis. The results of the readings are shown in Table 1 and partly illustrated in Fig. 2.

Prick tests with standard inhalant allergens supplemented with latex 500 μg/ml and pollens of *Dahlia* and German chamomile (*Matricaria chamomilla*) (Soluprick®; ALK-Abello A/S, Hørsholm, Denmark) as well as *Gerbera* and 'lily' 'as is' were negative.

Ten consecutive patients were patch tested with *E. pulverulenta* leaves (topside and underside moistened with water); five patients were patch tested with leaves from the same specimen as the patient and the other five patients with another fresher specimen, and they were all negative on D3 and D7.

Discussion

The *Eucalyptus* genus belongs to the Myrtaceae plant family (the myrtle family) that comprises 3800 species in 140 genera (6). The majority of *Eucalyptus* species, according to Mitchell and Rook (5), are native to Australia (7). This also applies to *E. pulverulenta* Sims (silver-leaved mountain gum), a small tree up to 6 m high, which is a popular ornamental because it retains its silvery grey leaves beyond its young stages (8). It is extensively used in floristry as decorative cut foliage in bouquets.

The majority of the positive plant allergen reactions in our patient, namely colophonium, tuliposide A, and jonquil/daffodil oleoresin, were considered relevant for the sometimes severe exacerbation of his hand eczema, whereas the reactions to the *Eucalyptus* leaves were considered relevant for his facial dermatitis. On the basis of his history and the clinical features, the volatile oil was considered to have been the primary sensitizer.



Fig. 2. The 2+ reactions to leaves of *Eucalyptus pulverulenta* 'Baby Blue' moistened with water (upper two reactions) and ethanol on D3.

Eucalyptus oils are present throughout the plants in leaves, fruits, buds, and bark (7). Commercial *Eucalyptus* oil, used in medicinal, fragrance, and flavour products, was originally obtained by steam distillation of the leaves of *Eucalyptus globulus* Labill. (Blue gum) and other *Eucalyptus* spp., but now, it is also produced synthetically (7, 9, 10). The essential oil contains both non-oxidized and oxidized terpenes (4). Both groups comprise potential sensitizers, that is, pinenes, linalool, citronellal, and linalyl acetate. Brophy et al. in their study of the steam volatile leaf oil of Australian grown *E. pulverulenta* detected 41 compounds, the most abundant of which were 1,8-cineole (eucalyptol) (82.5%), α-terpineol (6%), α-pinene (3%), α-terpinyl acetate (2.8%), and limonene (2%) (8). Zrira et al., however, studied *E. pulverulenta* growing in Morocco, and they detected, among other constituents, in order of decreasing quantity: 1,8-cineole (eucalyptol) (75.1%), α-copaene (4.8%), α-pinene (4.6%), limonene (2.1%), *p*-cymene (2%), and verbenone (1.8%) (7).

According to older reports quoted by Mitchell and Rook (5), the oils were considered more irritant than sensitizing. A recent German study seems to confirm the low allergenic potential: Willms et al. patch tested 46 healthy subjects with two topical cold remedies containing *Eucalyptus* and pine needle oil, and none tested positive (11). However, Rudzki et al. tested 200 consecutive patients with 35 essential oils, and *Eucalyptus* oil elicited positive reactions in 3, 2 of whom were also turpentine positive (1). Likewise, Schaller and Korting described a case of sensitivity to multiple essential oils with cross-reactivity to *Eucalyptus* oil (2).

Primary sensitization from *Eucalyptus* oil has been reported in two aromatherapists (3, 4): the Norwegian patient tested positive to *Eucalyptus* oil 5% pet. (3), while the British patient was positive to *Eucalyptus* oil 2% pet. (4). Furthermore, the latter tested strongly positive to α-pinene 10% and 5%, but negative

to β-pinene and eucalyptol, indicating that α-pinene was a primary sensitizer in this case (4). α-Pinene is widely distributed in essential oils, and because the patient had handled and was tested with 60 essential oils, the α-pinene sensitivity may be due to other essential oils with a higher content of this monoterpene.

Therefore, there is only one case of probably primary sensitization to *Eucalyptus* oil where the patient tested positive to the oil in the recommended concentration of 2% pet. (4, 12).

As we did not know the botanical name of the 'Baby Blue' *Eucalyptus* at the time of testing, the allergens were selected on the basis of information on *oil of Eucalyptus* derived from *E. globulus* Labill. (9). The doubtful positive reactions to the two isomers of α-pinene make primary sensitization to this terpene unlikely; furthermore, the concentration of α-pinene is less than 5% in oil of *E. pulverulenta*, and the concentration of α-phellandrene is even lower (7, 8). Moroccan *E. pulverulenta* has a high oil yield (7), and if this applies to the plants used in floristry, it may be a contributory factor to the development of contact allergy in our patient. Furthermore, his chronic hand eczema, exacerbated through contact with spruce, fir, tulips, *Alstroemeria* (Peruvian lilies), and daffodils, to which he was also sensitized, probably facilitated the sensitization to *E. pulverulenta*, especially because the patient handled the bundles with ungloved hands. The fact that our patient was negative to fragrance mix I, which was positive in the three case reports on *Eucalyptus* oil allergy (2–4), also points to *E. pulverulenta* as a primary sensitizer rather than a cross-reactant with fragrance terpenes.

The fact that there is only one well-documented case of primary sensitization from *Eucalyptus* oil (4) and few reports on sensitization from *Eucalyptus* plants (5) supports the view of a low allergenic potential of the oil in particular and the plants in general. Thus, sensitization is most likely to occur in persons who are occupationally exposed on a daily and/or long-term basis such as aromatherapists or florists.

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