



African blackwood (*Dalbergia melanoxylon*)-induced occupational allergic contact dermatitis in a professional piccolo flautist

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KEYWORDS: African blackwood, case report, *Dalbergia melanoxylon*, occupational allergic contact dermatitis, piccolo flute

African blackwood (*Dalbergia melanoxylon*), also known as mpingo or grenadilla, is a small dry-climate African tree with grey bark and very dense red to black core wood. It is a member of the genus *Dalbergia*, and is distinct from ebony, which involves many different species in the genus *Diospyros*. Grenadilla can be used to manufacture

furniture, small decorative items and statues, hair brushes, knife handles, and chess pieces. Because of its good tonal features, grenadilla is especially suitable as a raw material for wooden musical instruments (oboes, clarinets, recorders, banjos, and piccolo flutes). Grenadilla, like various other tropical wood materials, can cause both

irritant and allergic contact dermatitis.¹⁻⁴ Allergic cross-reactions, especially with various rose woods belonging to the genus *Dalbergia*, are possible.³ Grenadilla was previously shown to cause allergic contact dermatitis in the lips in a hobby recorder player.⁵ Here, we report, to the best of our knowledge, the first case of occupational allergic contact dermatitis in a professional piccolo flute musician sensitized to grenadilla.

CASE REPORT

A 60-year-old female musician had played both transverse and piccolo flutes in a philharmonic orchestra from the early 1980s onwards. The piccolo was her primary instrument until the year 2000, after which she had played both piccolo and transverse flutes. She had a history of mild atopic dermatitis, but no signs of previous adulthood facial dermatitis. She was referred to the allergy unit of our clinic because of persistent lower-lip cheilitis and hand eczema, the symptoms of which had been present for approximately 18 months. The eczematous dermatitis in her hands, fingers, and lower lip, as well as the occasional exacerbation phases, were clearly connected with flute playing. Her symptoms became gradually more chronic and resistant to topical corticosteroids over time. Her own gilded transverse flute made of alloy was first expected to have caused allergic contact dermatitis (Figure 1).

Patch testing was performed with the international baseline series (Chemotechnique Diagnostics, Vellinge, Sweden) and with additional series, including metals, antimicrobials, cosmetics and preservatives, fragrances, topical corticosteroids, and plastics and glues. A small scratch sample of the inner part of the patient's piccolo flute pipe was initially added to the tests. Patch testing was performed according to ICDRG-approved criteria. Commercially available patch test allergens were applied on the healthy upper back skin with Finn Chambers (Epitest, Tuusula, Finland or SmartPractice, Phoenix, Arizona), and attached with Scanpor tape (Norgeplaster, Vennesla, Norway). The interpretation of the patch tests results was performed after 2 and 4 days.

The results of the patch tests showed contact allergy to *Myroxylon pereirae*, fragrance mix, tixocortol-21-pivalate, hydrocortisone-17-butyrate, and the patient's own grenadilla wood from the piccolo flute. To confirm the suspected contact allergy to grenadilla, we retested the pure untreated grenadilla sample provided by the Keefe Piccolo Company (Winchester, Massachusetts) and the almond oil (provided by the same manufacturer) that is used to treat the

instruments before they are sold to musicians. Almond oil gave negative results, but grenadilla yielded allergic reactions in all of the vehicles that were used (pet., ethanol, and physiological saline). To exclude the possibility of irritant reactions, we titrated grenadilla (sawdust) as follows: 33%-11% to 3.7%-1.2% in pet. The lowest concentration still gave an allergic ++ reaction, and all of the reactions to this serial dilution series clearly increased from day (D) 2 to D4, thus confirming contact allergy to grenadilla. Patch tests with grenadilla 50% pet. gave negative results in three control subjects. As previously shown, our patient also reacted to different samples of rose wood. Prick tests with grenadilla and both rose woods (sawdust) gave negative results in immediate and delayed readings.

DISCUSSION

Our patient developed occupational contact allergy to grenadilla and clinically relevant allergic contact dermatitis on the lower lip/chin and the hands after over a period of almost 40 years of professional piccolo playing. She had never previously suffered from any skin allergy symptoms related to the piccolos and transverse flutes that she had played over the years. The onset of the symptoms was preceded by a time period during which she had played and tested many different piccolos at her work. On patch testing, she had no reactions to any metals of the corresponding series, and gold sodium thiosulfate also gave a negative result. Contact allergies to tixocortol-21-pivalate and hydrocortisone-17-butyrate were also relevant, as she had used creams containing these corticosteroids to treat her dermatitis. These corticosteroid creams, however, did not exacerbate the symptoms, and she had started to use them long after the onset of the piccolo-associated lip and hand dermatitis. She even reported that these creams alleviated her symptoms. Allergy to fragrances had most evidently developed from common cosmetic sources earlier, and the patient had not used any scented oils or creams on her lips or hands prior to the dermatitis.

Contact allergy to rose wood is most likely attributable to a cross-reaction with grenadilla. The patient did not have a clear, or at least repeated, history of rose wood exposure in the form of flutes, other musical instruments, or any other objects. The possible common antigens between grenadilla and rose wood are, as earlier suggested, (S)-4'-methoxydalbergione and (S)-4'-hydroxy-4-methoxydalbergione, which are among the quinones present in various *Dalbergia* plants.^{3,6} Quinone-induced allergic contact dermatitis was shown in a violinist's neck area.⁷



FIGURE 1 Allergic contact dermatitis in the lower lip area and fingers caused by an African blackwood (grenadilla)-containing piccolo flute

The chin rest of the affected patient's instrument was supposed to be of rose wood origin. In contrast to true allergic contact dermatitis, a phenomenon called flautist's chin or lip is occasionally seen in professional musicians playing flutes.⁶ It is suggested to represent a form of irritant contact dermatitis resulting from the frequent mechanical friction caused by the instrument. A similar phenomenon occasionally affects violin players (fiddler's neck).⁸ Our patient had never experienced any irritative symptoms, which usually also correspond directly to the amount of flute playing. Her lip/chin and hand dermatitis was alleviated when she avoided the piccolo and continued with only her gilded transverse flute. Later, itchy, dry and cracked dermatitis on the lower lip, chin and hands/fingers in contact with the flute returned when she had to practise and play the piccolo for a concert, thus confirming clinically relevant allergic contact dermatitis. The patient has tried to play the piccolo with a silvery mouth piece and plastic cover in the lip contact region. Symptoms have nevertheless continued, especially in the hands, which are still in contact with grenadilla. Milder dermatitis was also present in lip area, possibly owing to a concomitant delayed type IV immunological reaction re-occurring at the site of previous grenadilla contact.

In conclusion, *D. melanoxylon*/grenadilla may also cause occupational contact allergy leading not only to chin area dermatitis but also to hand dermatitis. Contact allergy to tropical woods should be kept in mind when professional or hobby musicians develop eczematous dermatitis related to their instruments.

CONFLICTS OF INTEREST

The authors report receiving educational grants from Celgene, Novartis, Janssen, and Leo pharma.

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How to cite this article: Vihervaara A, Liippo J. African blackwood (*Dalbergia melanoxylon*)-induced occupational allergic contact dermatitis in a professional piccolo flautist. *Contact Dermatitis*. 2019;81:294–296. <https://doi.org/10.1111/cod.13285>