

Genipin in Temporary Jagua Tattoos – Black Dye Causing Severe Allergic Dermatitis

To the Editor:

Black henna tattoos are still popular and often result in allergic contact dermatitis due to high concentrations of *p*-phenylenediamine (PPD). Therefore, other black dyes, such as the sap of the jagua fruit of *Genipa americana* L., that are advertised as natural and safe have been recently marketed.

A 16-year-old adolescent girl had a temporary black tattoo painted by a tattooist on the back of her left hand (Fig. 1) using a ready-to-use jagua gel. After 8 days, erythema and itching started. Two days later, a papulovesicular contact dermatitis developed requiring topical corticosteroids (Fig. 2). The patient had never had any temporary or permanent tattoos before.

Patch tests were performed with the European standard series, a hairdresser series containing PPD and different *p*-aminophenol compounds (Almirall, Germany). The single components of the jagua gel (*G. americana*, phytosqualane, xanthan gum, potassium sorbate, citric acid) were applied for 2 days in IQ-ultra test chambers on the upper back as previously described.¹ Genipin (CAS no. 6902-77-8; TCI Europe, Eschborn, Germany) was tested at 1% dissolved in dimethyl sulfoxide and water 1:1. All patch tests were negative at days 2 to 4. On day 5, the bluish genipin test was infiltrated and pruritic and became papulovesicular 2 days later.

Analysis of the applied jagua gel did not reveal PPD. Repeated measurements showed genipin present at a mean (SD) concentration of 0.565% (0.032%) and its precursor geniposide below the detection limit of less than 0.001%.¹

Genipa americana L., known under the common name of jagua, is a tree originally from the Amazon basin.² Its fruit sap has been used by indigenous people as a wound treatment, an insect repellent, and a dye for ornamental tattoos.³ When applied to the skin, it turns into a dark blue–black color, which persists for approximately 7 to 10 days.²

Few cases of contact allergy from jagua tattoos have been reported. A dancer applying an ornamental stocking pattern was not further evaluated.⁴ A recent case had similar features: a beautician had previously applied black henna tattoos without adverse effects. Upon the first application of a jagua tattoo, she developed acute vesicular dermatitis after 3 weeks, resulting

in postinflammatory hyperpigmentation.⁵ In our 2 cases, genipin has been identified as a responsible allergen.¹ Apparently, short exposure to genipin in jagua dye may result in sensitization and long-lasting allergic contact dermatitis.

Genipin and its concentration are not labeled in commercial jagua tattoo dyes, and its natural origin may lead to variations among different products. Therefore, a test concentration of 1% was chosen. However, to avoid active sensitization by patch testing, we recommend using test concentrations of 0.5% or lower, and vehicles other than dimethyl sulfoxide/water could be feasible.

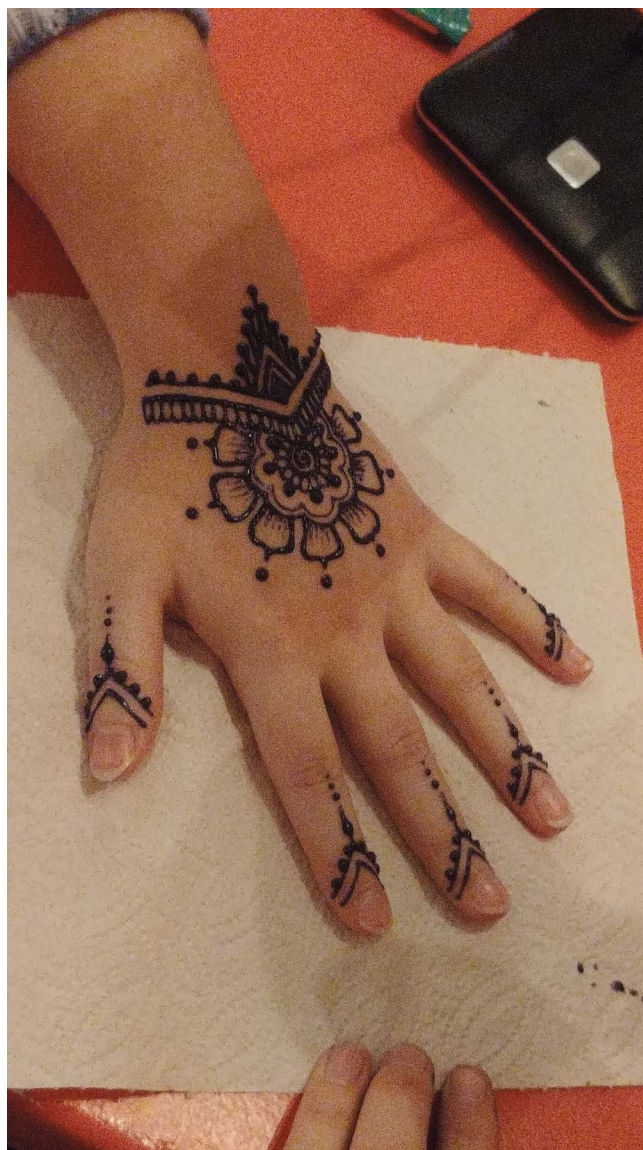


Figure 1. Freshly painted temporary black tattoo using ready-to-use jagua gel.

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Figure 2. Allergic contact dermatitis to genipin in jagua gel (approximately 14 days after the first application).

Genipin is currently used in traditional Chinese medicine, industrial processes, and topical medical devices. It may be used in the future in pharmaceuticals. Application in sensitized patients could result in systemic contact dermatitis or allergic exanthems. Dermatologists should be aware of this new contact allergen in temporary jagua tattoos and should discourage the application of such dyes.

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Psoriasis-like Dermatitis Developing in a Patient with Atopic Dermatitis Treated with Dupilumab

To the Editor:

Atopic dermatitis (AD) and psoriasis are chronic, inflammatory skin diseases that may be phenotypes at polar ends of the T-cell inflammatory milieu.¹ Type 2 T helper (T_H2) cytokines interleukin (IL)-4, IL-13, IL-31, and possibly IL-22 are implicated in AD pathogenesis. Type 1 T helper cytokines IL-17 and IL-23 are implicated in psoriasis, without activation of IL-4 or IL-13.¹ Dupilumab is a fully human monoclonal antibody targeting the IL-4 receptor α subunit, thereby blocking IL-4

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M.S. and J.I.S. had full access to all of the data in the study and take responsibility for the integrity of the data. J.I.S. conceived and designed the study. J.I.S., M.S., J.G., and T.T. performed the acquisition, analysis, and interpretation of data. M.S. and J.I.S. drafted the manuscript. J.I.S., M.S., J.G., and T.T. performed the critical revision of the manuscript for important intellectual content.

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