

Adverse reactions to the processionary caterpillar: irritant or allergic mechanism?

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The pine processionary caterpillar (*Thaumetopoea pityocampa*) and its urticating hairs are a well-described cause of skin reactions, usually produced by an irritant mechanism. Occasionally, an allergic mechanism underlying these reactions may occur.

Case Report

A 24 year-old-woman, with a history of perennial rhinoconjunctivitis, developed an urticarial reaction affecting her legs, arms, neck, and face that she attributed to indirect exposure to caterpillars when staying in a pine tree area. After a second exposure 2 months later, she developed severe facial angioedema, erythema, wheezing, chest tightness, nausea, and sickness for which she required repeated systemic therapy.

Skin prick tests (SPT) to common aeroallergens (pollens, mites, danders, and moulds) were performed, with a positive result only for dust mites. A pine processionary caterpillar extract was prepared (Bial-Aristegui Laboratory, Bilbao, Spain). A SPT with this extract elicited a positive response. Specific IgE determination with the caterpillar extract was carried out (Enzyme AllergoSorbent Test system, Hytec, Hycor Biomedical Ltd., Penicuik, UK) with a positive result: 0.40 kU/l (total IgE of 110 kU/l). In order to detect the allergen responsible for this reaction, we performed an SDS-PAGE immunoblotting, which showed an IgE-binding band around 59 kDa (Fig. 1).

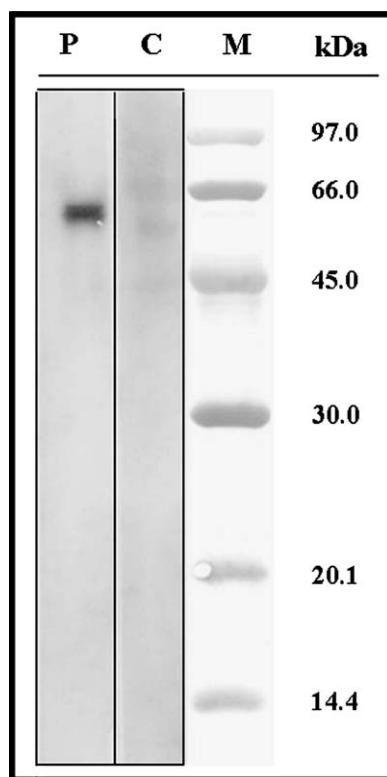


Fig. 1. SDS-PAGE immunoblotting of the pine processionary caterpillar extract. Lane P: patient's serum, lane C: control serum (pool from non-atopic subject's serum), and lane M: molecular mass markers.

Discussion

The pine processionary caterpillar is a nocturnal Lepidoptera of the Thaumetopoeidae family, plentiful in European forests. In humans, adverse reactions are caused by airborne exposure to its hairs. It is common to find such reactions in pine wood area workers, exposed to high levels of caterpillar hairs. Most of the patients with non-occupational exposure to processionary develop symptoms on the L4–L5 larvae stage (from February to May) when the caterpillars may have up to one million of these hairs (1).

Contact dermatitis and urticaria are the most frequent symptoms related to the exposure to this insect (2). These reactions are usually produced by an irritant mechanism due to contact with its urticating hairs, which, upon entering and breaking in the skin, produce basophil degranulation with histamine release. This IgE-independent degranulation is related to a protein contained in its hairs – thaumetopoein, which has histamine-releasing properties (3).

Occasionally, direct or indirect contact with the urticating hairs can induce more severe reactions (4), and frequently, there is an IgE-mediated mechanism involved in these cases.

Thaumetopoein was first described as a non-IgE-mediated mast cell degranulator, with a molecular weight of 28 kDa, composed of two subunits of 13 and 15 kDa (3). Later, several IgE-binding bands involved in allergic reactions were described (1, 2, 4–7). Moneo et al. (7) identified a protein, Thau p 1, with molecular mass around 15 kDa as a major allergen, but unfortunately, they could not compare its amino acid sequence with that of thaumetopoein.

We report a case of a patient who initially presented urticaria after exposure to processionary caterpillars but developed more severe symptoms after a second contact. We have demonstrated a type I hypersensitivity mechanism with an IgE-binding band involved with a molecular weight around 59 kDa.

Physicians should be aware that although cutaneous reactions after exposure with caterpillars are generally irritant, allergic reactions may develop and these may be severe.

References

1. Fuentes Aparicio V, Zapatero Remón L, Martínez Molero MI et al. Allergy to pine processionary caterpillar (*Thaumetopoea pityocampa*) in children. *Allergol Immunopathol (Madr)* 2006; 34: 59–63.
2. Vega J M, Moneo I, Armentia A et al. Allergy to the pine processionary caterpillar (*Thaumetopoea pityocampa*). *Clin Exp Allergy* 1999; 29: 1418–1423.
3. Lamy M, Pastureaud M-H, Novak F et al. Thaumetopoein: an urticating protein from the hairs and integument of the pine processionary caterpillar (*Thaumetopoea pityocampa*, Schiff., Lepidoptera, *Thaumetopoeidae*). *Toxicol* 1986; 24: 347–356.
4. Vega J M, Moneo I, Armentia A et al. Anaphylaxis to a pine caterpillar. *Allergy* 1997; 52: 1244–1245.
5. Fuentes Aparicio V, de Barrio Fernández M, Rubio Sotés M et al. Non-occupational allergy caused by the pine processionary caterpillar (*Thaumetopoea pityocampa*). *Allergol Immunopathol (Madr)* 2004; 32: 69–75.
6. Werno J, Lamy M, Vincendeau P. Caterpillar hairs as allergens. *Lancet* 1993; 342: 936–937.
7. Moneo I, Vega J M, Caballero M L et al. Isolation and characterization of Thau p 1, a major allergen from the pine processionary caterpillar *Thaumetopoea pityocampa*. *Allergy* 2003; 58: 34–37.

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