
Case report

Psoriasiform contact dermatitis due to propolis in a beekeeper

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Background: More than 250 cases of allergic contact dermatitis due to propolis have been described. A few of these occurred in beekeepers.

Objective: To describe a case of psoriasiform dermatitis caused by propolis in a beekeeper who thought that his lesions were related to honeybee stings.

Methods: A 45-year-old beekeeper experienced hand dermatitis for the past 5 years. He believed that the lesions occurred and worsened when he was stung by honeybees. He was prescribed topical corticosteroids several times, but because he was stung frequently, the drugs never helped control the lesions. In the past few years, he frequently had contact with propolis during honey collection, but he denied the role of propolis because he was wearing gloves while handling the beehives. For diagnostic evaluation, skin biopsy, skin prick tests (SPTs), identification of specific IgE antibodies, and atopic patch tests were performed.

Results: Skin biopsy showed psoriasiform contact dermatitis. Results of SPTs to honeybee and serum specific IgE for *Apis mellifera* remained negative. Results of the atopic patch test performed using *A mellifera* SPT material were also negative in the first 20 minutes and on the second and third days. However, propolis showed a positive erythematopapular reaction on day 2. The patient never again worked as a beekeeper, and neither did he, as far as he knew, use any medical or cosmetic products that contained propolis. His hand lesions improved almost completely.

Conclusion: Dermatitis due to propolis should never be disregarded in beekeepers, and every effort should be put forth to make a correct diagnosis and to convince the patients of the cause.

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INTRODUCTION

Propolis (Royal Jelly) is a secretion of the hypopharyngeal glands of young worker honeybees (*Apis mellifera*) and is widely used in the community as a health tonic. About half of its dry weight consists of protein; the other components are free amino acids, fatty acids, sugars, vitamins, and some minerals. Propolis is used by honeybees to seal crevices in the hives and to embalm dead invaders and other particles in the hive to prevent their microbial decomposition.¹ More than 250 cases of allergic contact dermatitis caused by propolis have been described. A few of these cases occurred in beekeepers. We describe a case of psoriasiform contact dermatitis due to propolis in a beekeeper who thought his lesions were related to honeybee stings.

CASE REPORT

A 45-year-old, nonatopic beekeeper had dermatitis on the palms and the sides of the fingers (Fig 1). He had been

working as a beekeeper for 25 years, and the first skin lesions appeared approximately 20 years after he started this occupation. Particularly within the past few years, the patient frequently had contact with beeswax (propolis) during honey collection. He believed that his hand lesions worsened when he was stung by honeybees. He reported that he was prescribed topical corticosteroids several times, but because he was stung almost every day, the drugs did not adequately control his hand lesions.

METHODS

Skin prick testing (SPT) was performed using commercially available *A mellifera* (300 µg/mL) (ALK, Copenhagen, Denmark). Histamine phosphate (10 mg/mL) and glycerinated saline were the positive and negative controls, respectively. The SPT result was regarded as positive when the wheal size was at least 3 mm larger than the negative control. *Apis mellifera* specific IgE (Pharmacia CAP system; Pharmacia, Uppsala, Sweden) levels were measured according to the manufacturer's instructions. For atopic patch testing, 1 drop of honeybee venom (ALK) was put on filter paper and then applied to the uninvolved skin of the patient's back using aluminum cups on adhesive tape (Finn Chambers on Scanpor; Epitest, Tuusula, Finland), which ranged in diameter from 8 to 12 mm. Patch testing was also performed using the Euro-

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Figure 1. Diffuse desquamation with some dyshydrotic vesicles and crust formation on the volar sides of the patient's hands.

pean standard series and propolis. Reactions were classified as positive if erythema with infiltration occurred. A skin biopsy sample was collected from the newly occurring skin lesion on his right hand, fixed in formalin, and stained with hematoxylin-eosin.

RESULTS

Results of SPTs to honeybee revealed neither wheal nor erythema. Serum specific IgE for *A mellifera* also remained negative. Skin biopsy findings confirmed the diagnosis of psoriasiform contact dermatitis (Fig 2). Results of patch testing performed using the European standard series were negative. Results of the atopic patch test performed using *A mellifera* SPT material (because the patient believed that his lesions deteriorated by sittings) also remained negative in the first 20 minutes and on the second and third days. However, propolis (10% petroleum) showed a positive erythematopapular reaction on day 2 (Fig 3). The patient never again worked as a beekeeper, and neither did he, as far as he knew, use any medical or cosmetic products that contained propolis. His hand lesions improved almost completely.

DISCUSSION

Propolis, a substance with strong adhesive properties, is used by honeybees to seal crevices in the hives and to embalm dead invaders and other particles in the hive to prevent their microbial decomposition.¹ More than 46 constituents have been found in this natural product.

The major source of propolis is the resinous exudate of poplar buds collected by the bees. The principal sensitizing agents seem to be 3-methyl-2-butenyl caffeate and phenylethyl caffeate. Besides these, there are probably other moderately sensitizing allergens in propolis.² Contact dermatitis to propolis is not rare. More than 250 cases of allergic contact dermatitis caused by propolis have been described. A few of these cases occurred in beekeepers.³ The increase in such contact dermatitis in the past 2 decades has been caused by

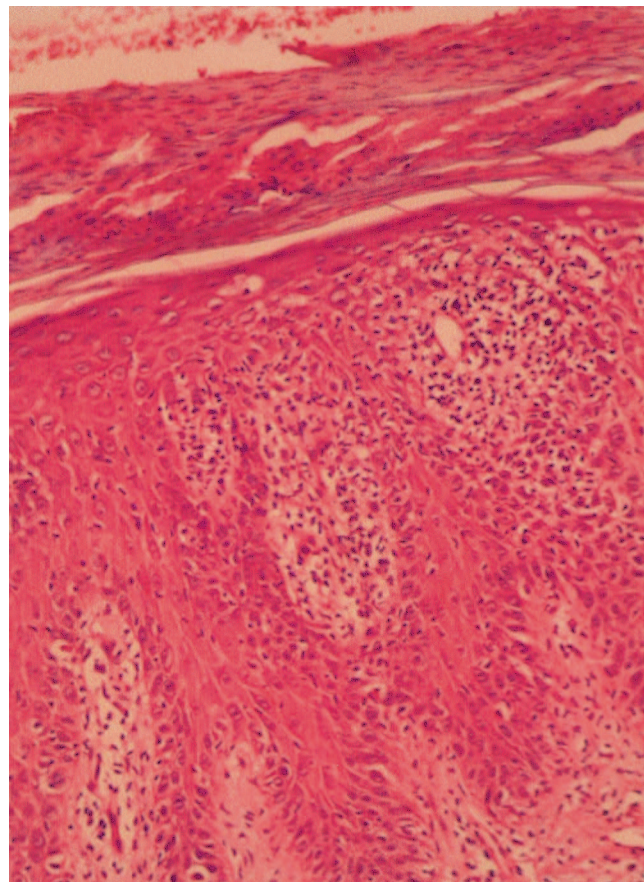


Figure 2. Histologically, there was thick, parakeratotic keratin tissue in superficial areas. In the epidermis, there was waste psoriasiform hyperplasia, lymphocytic exocytose, and focal spongiosis. In the superficial dermis, there was vascular proliferation surrounded by lymphocytes and a mixed inflammatory infiltrate (hematoxylin-eosin, original magnification $\times 200$).

the use of propolis in pharmaceutical and cosmetic preparations. Besides the sensitization of beekeepers, only a few other instances of occupational contact dermatitis have been reported: a forest worker and a farmer, who had contact with poplar trees while cutting branches⁴; an artist, who was molding with beeswax⁵; an instrument maker, who probably had contact with varnish containing propolis⁶; and a worker in a retail store, who probably had contact with varnish containing beeswax.⁷

The patient described herein frequently had contact with propolis during honey collection in the past few years, but he denied the role of propolis in the development of the hand lesions because he was continuously wearing gloves while handling beehives. Furthermore, he believed that his hand lesions worsened when he was stung by honeybees. Negative atopic patch test results and negative SPT results and the absence of specific IgE to honeybee allergens suggested that these allergens were not related to the dermatitis. However, there was a conclusive reaction to propolis on day 2, which



Figure 3. A, Atopic patch testing with honeybee allergen using Finn Chambers measuring 8 to 12 mm in diameter. Propolis in petrolatum was also applied using Finn Chambers. B, Results of the atopic patch test performed using *Apis mellifera* skin prick test material remained negative in the first 20 minutes and on the second and third days. However, propolis showed a positive erythematopapular reaction at 48 hours.

pointed to its role in the development of the dermatitis. Thereafter, the patient remembered that there was slight contact with propolis while he was taking off his gloves. With the guidance of the convincing role of the positive result of the patch test with propolis, the patient decided to quit working as a beekeeper. Although the patient was subsequently stung by honeybees, his hand lesions improved almost completely, because he never had contact with propolis again. In summary, dermatitis caused by propolis should never be disregarded in beekeepers with dermatitis, and every effort may be needed to make a correct diagnosis and to convince the patients of the cause.

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