

Occupational allergic contact dermatitis caused by basil (*Ocimum basilicum*)

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Basil (*Ocimum basilicum*) is a member of the Lamiaceae (formerly Labiatae) family. This family includes various herbs, such as hyssop, basil, marjoram, oregano, sage, rosemary, lavender, and thyme (1). Both type I and type IV hypersensitivity reactions to this family of plants have been reported. We present a case of a herb packer who developed occupational allergic contact dermatitis caused by basil.

Case Report

A 45-year-old atopic woman, with a history of asthma, was employed as a packer of herbs from April 2007 to December 2008. Her duties mainly consisted of putting flowerpots of herbs into plastic bags. After a few months of working, she developed pruritic erythema and blistering on the backs of the hands. She also complained of

shortness of breath and rhinitis. Her history suggested that the skin lesions were related to handling herbs at her workplace. Because of hand eczema, she was compelled to stop working, after which most of the skin symptoms disappeared.

We performed patch tests with the European baseline series, fragrance series, menthol (Chemotechnique Diagnostics, Vellinge, Sweden), and fresh leaves of plants from the workplace: basil (Fig. 1), mint (*Mentha piperita*), oregano (*Origanum vulgare*), common sage (*Salvia officinalis*), sweet balm (*Melissa officinalis*), thyme (*Thymus vulgaris*), and rosemary (*Rosmarinus officinalis*) (all 'as is'). Positive reactions at D2 and D4 are given in Table 1 and shown in Fig. 2.

Ten healthy volunteers were patch tested with leaves of herbs, but there were no positive reactions.

Prick tests with inhalant and food allergens showed hypersensitivity to *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*, *Lepidoglyphus destructor*, and tree pollens. Prick-to-prick testing with fresh leaves of herbs showed negative results at 20 min. Total serum IgE was normal (85.82 IU/ml), but IgE specific for *Dermatophagoides* was found (13.0 kU/l) (Unicap, Pharmacia,

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Fig. 1. *Ocimum basilicum*.

Table 1. Positive patch test results at D2 and D4

Allergen	D2	D4
Myroxylon pereirae	++	++
Fragrance mix I	+++	+++
Eugenol	+++	+++
Isoeugenol	+++	++
Basil leaf (as is)	+++	+++

Uppsala, Sweden). From the clinical findings, positive results of patch tests, and negative results of prick tests with herbs, our final diagnosis was occupational allergic contact dermatitis caused by *Ocimum basilicum* and atopic asthma.

Discussion

Allergic contact dermatitis solely attributable to *O. basilicum* has not been previously reported. Positive patch test results with essential oil of basil have been obtained in professional aromatherapists known to have multiple allergies to essential oils (2). Two cases of immediate allergic reactions after ingestion of basil in pesto sauce have been reported, confirmed by positive prick test reactions to various members of the Lamiaceae



Fig. 2. Positive patch test to basil leaf (as is).

family (3). Positive prick test results or IgE specific for basil were also recorded in patients with exercise-induced anaphylaxis (4). In contrast, our case is a type IV hypersensitivity reaction with positive patch test and negative prick test results.

There are some reports of allergic reactions to members of the Lamiaceae family: among others, allergic contact dermatitis caused by various species of mint, such as spearmint (*Mentha spicata*) (5) and pennyroyal (*Mentha pulegium*) (6), occupational allergic contact urticaria caused by pennyroyal (1), and allergic contact dermatitis caused by rosemary (7). Systemic reactions after the ingestion of oregano and thyme have also been reported (8). Positive patch tests results with oregano were noted among individuals with suspected allergy to spices (9). Contact allergy to essential oils of the Lamiaceae family, such as lavender oil, spearmint oil, or peppermint oil, has also been reported (10–12). Previous observations, clinical studies, *in vivo* tests and *in vitro* tests suggested cross-reactivity among the different species of the Lamiaceae family (7, 8) but, in our case, patch test results with all herbs except for basil were negative. Concomitant positive patch test reactions to basil and eugenol or isoeugenol may result from the fact that basil contains eugenol. Koeduka et al. showed that *O. basilicum* synthesizes and accumulates chemicals such as phenylpropenes, and possesses an enzyme that can use coniferyl acetate and NADPH to form eugenol (13).

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