
Allergic Rhinitis Due to the Ornamental Plant *Sansevieria trifasciata*

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Sansevieria trifasciata is a plant that is widely found in homes and parks and is commonly known as “snake plant” or “mother-in-law’s tongue”. It is a herbaceous, perennial, succulent plant with long lanceolate leaves that belongs to the Asparagaceae family, in the Asparagales order. [1]. *S trifasciata* is mostly used as an indoor ornamental plant and to improve indoor air quality [2]. Allergic rhinitis associated with indoor plants has been described [3], although no cases of sensitization to *S trifasciata* have been reported to date.

We report the case of a 37-year-old man previously diagnosed with atopic dermatitis and rhinitis by sensitization to grass pollen who attended our allergy service with a 1-year history of perennial sneezing and nasal congestion that he associated with being at home, especially in his living room, where he had several plants.

An allergological study was carried out using a skin prick test (SPT) with extracts of common allergenic sources (pollen from *Cupressus arizonica*, *Platanus acerifolia*, *Olea europaea*, *Lolium perenne*, grass mix, *Artemisia vulgaris*, *Salsola kali*, and *Parietaria judaica*, as well as *Dermatophagoides pteronyssinus*, *Dermatophagoides farinae*, cockroach, *Alternaria alternata*, *Aspergillus fumigatus*, *Cladosporium herbarum*, and dog and cat dander) and pollen profilin (Pho d 2, Roxall). The results were positive for pollens from grass (3×3 mm) and *Lolium perenne* (3×3mm). A prick-prick test (PPT) was also performed with the plants present in the patient’s home (*Ficus benjamina*, *S trifasciata*, *Pilea peperomioides*, *Monstera deliciosa*, *Aloe vera*, kentia, pote, and bamboo). The results were positive only for *S trifasciata* (4×5 mm). A PPT with *S trifasciata* was also performed in 4 nonallergic individuals, yielding a negative result in all 4 cases.

An SPT performed for edible foods from the Asparagales order, including onion, garlic, and asparagus, revealed slight sensitization to asparagus (2×3 mm). The patient had never experienced problems with these foods.

An in vitro study was performed to determine total serum IgE (39.9 kU/L) and specific IgE (ImmunoCAP; kU_A/L) to

rBet v 1, rBet v 2, rPhl p 12, rPru p 3, and extracts from garlic, onion, asparagus, and latex. The results were positive for garlic (0.88), onion (0.74), asparagus (0.69), and latex (0.67).

Finally, a protein extract from *S trifasciata* leaf was prepared by homogenization in phosphate-buffered saline (20% wt/vol) followed by dialyzation and lyophilization. An SDS-PAGE immunoblotting assay with *S trifasciata* leaf extract was carried out under standard conditions (2-mercaptoethanol) as described by Laemmli [4]. The assay was performed using 3 different polyvinylidene difluoride membrane blockers (skimmed milk, egg white, and fish collagen), and the same results were obtained, namely, an IgE-reactive area between 100 and 37 kDa and 2 IgE-binding bands of 17.5 and 18.5 kDa (Figure, result with skimmed milk).

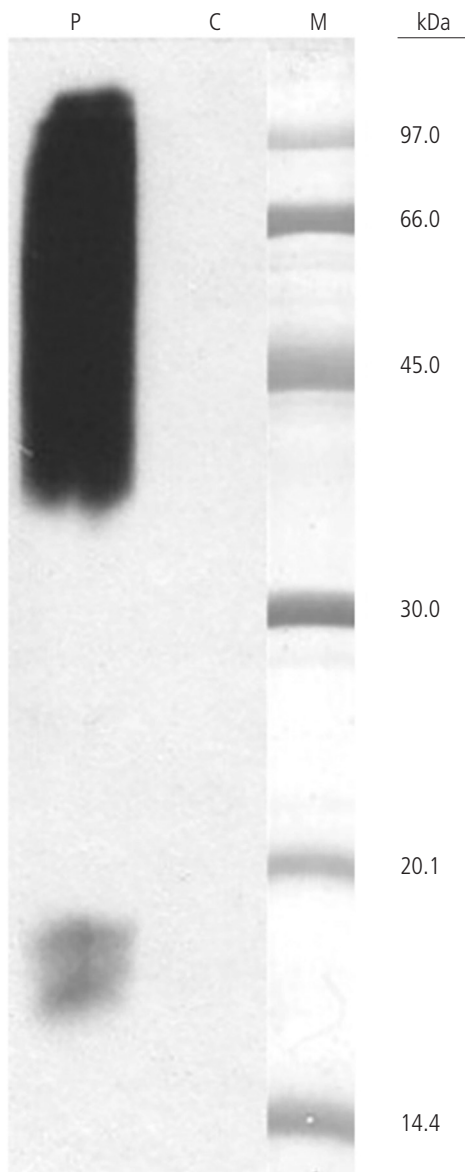


Figure. SDS-PAGE immunoblotting with *Sansevieria trifasciata* leaf extract.

Lane P, Patient's serum; Lane C, Control serum (pool of sera from nonatopic individuals). M indicates molecular mass standard.

The patient was instructed to avoid exposure to *S trifasciata*. His clinical condition improved significantly once the plant had been removed.

Allergy to ornamental plants is unusual, although some studies, such as that of Goldberg et al [5], have reported that the incidence of sensitization to 11 species of ornamental plants was 17%-23% among the general population and 52% in flower growers. In the latter group, 45% had nasal, ocular, and respiratory symptoms associated with exposure to the plants tested. Other studies stress the degree of exposure, since high degrees of exposure are associated with a greater frequency of sensitization. Moreover, Axelsson et al [6] studied the plant *Ficus benjamina* and found no evidence of sensitization in office workers exposed only at work, unlike those who had the plant at home and who were mostly sensitized. This observation is consistent with the findings of our study, where the patient also had the plant at home.

Patients often relate their symptoms to exposure to the plant, as in the study by Herrera-Lasso et al [7], who reported a case of hypersensitivity to another houseplant, *Spathiphyllum wallisii*, where the patient presented with bronchospasm and severe rhinoconjunctivitis on exposure to the plant she had at home.

Atopic patients are more vulnerable to sensitization, although some cases of allergy to ornamental plants in nonatopic patients have been reported [8]. Aydin et al [9] showed that among individuals who owned ornamental plants, atopic individuals were more sensitized to ornamental plants than nonatopic individuals (74.6% vs 31.9%). In the present case, the patient had a history of atopy, atopic dermatitis, and rhinitis due to sensitization to grass pollen. Axelsson [8] analyzed the allergenic source of ornamental plants in the case of *F benjamina* and concluded that the allergen in this case emanated from the milky sap of the plant. Water diffuses through the leaf and brings out the allergen by osmosis on the upper surface of the leaf, where the dust sucks up the water. Once the water evaporates, the allergens mix with the dust and become airborne and, therefore, can be inhaled. In the present case, sensitization to *S trifasciata* may have occurred by a similar mechanism, although we were unable to prove this. In any case, the novelty of our study was that we used immunoblotting to demonstrate the presence of IgE-reactive proteins from *S trifasciata*, thus explaining the IgE-mediated response of the patient to the plant.

The sensitization to latex we detected is striking. However, since the patient had had sporadic contact with latex utensils with no complications, we do not consider it clinically relevant. Furthermore, there is no taxonomic relationship with *S trifasciata* that could cause cross-reactivity.

Significantly, the patient was sensitized to asparagus, garlic, and onion (foods from the Asparagales order, for example, *S trifasciata*) probably due to cross-reactivity. However, in the present case, this finding has no clinical relevance, since the patient tolerated all these foods.

Once the most common causes have been ruled out, we conclude that indoor plants should be taken into consideration in the study of persistent and/or perennial allergy symptoms.

To the best of our knowledge, this is the first reported case of a patient with symptoms of allergic rhinitis associated with

exposure to *S trifasciata*. Sensitization was demonstrated by PPT and SDS-PAGE immunoblotting, which was able to detect serum specific IgE that recognizes plant leaf proteins.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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