

Allergy to Weeping Fig – A New Occupational Disease

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During the last decade green plants have become more common in interior decoration. There are companies specializing in the leasing of green plants to public buildings and offices. Weeping fig is one of the most popular green plants. Dust and dry components of the plant are usually removed by vigorous shaking. In this way the allergen becomes airborne. During a few months we have seen several plant keepers who have developed airway allergy to weeping fig. Two of them have been thoroughly investigated. Both are atopics. Extracts were made from leaves and branches and both patients had positive skin prick tests and RAST. The risk of sensitization in plant keepers who work with weeping fig is probably considerable.

Key words: allergy; asthma; *Ficus benjamina*; gardener; occupational disease; weeping fig.

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The genus *figus* belongs to the mulberry family (Moraceae) with about 1000 species, most of them occurring in rain forests. Fig, sycamore and India rubber trees belong to this genus.

Weeping fig (*Ficus benjamina*) grows wild in tropical Asia, usually epiphytically on larger trees, but gradually develop into ground plants by sending down roots. Aerial roots also descend from the branches. Weeping fig is one of the most popular pot plants in Scandinavia, it is common in public buildings, offices and in many homes, being a very decorative plant and easy to cultivate. Indoors the plant is often cultivated into a small tree.

During recent years, companies specializing in the leasing of green plants to offices and public buildings, have been established. This means that employees of the leasing companies deliver and take regular care of the plants. The workmen who do this job are often in close contact with weeping fig. During a few months we have seen several plant keepers who have developed airway allergy to this plant. We have investigated two of them thoroughly.

PATIENTS AND METHODS

Case 1

A 22-year-old man who has had bronchial asthma since he was 10 years old. An allergological investigation at that time showed sensitization to birch pollen and animal dander. He was hyposensitized against these allergens for 3½ years with a good result. In connection with airway infections he still had problems with his asthma, however. In spite of his allergy, he studied to become a gardener. He then worked for 18 months in a green-house without worsening of his asthma. In the autumn of 1983 he began to work for a company that leases various green plants. During work, he transports the plants in a small van, waters, nourishes, cleans the leaves, removes withered parts and replaces old specimens with new ones. The weeping fig requires special management, because of its many small leaves. It is vigorously shaken to remove dust, and any dry leaves. A few months after starting

this work, the man noticed a deterioration in his bronchial asthma and developed symptoms of allergic rhinoconjunctivitis. He suspected these symptoms to be related to exposure to weeping fig. Routine skin prick tests were 3+ for animal dander, 3+ for birch pollen and 2+ for mite allergen. Scoring of test reactions was made according to the Nordic guidelines with histamine chloride 1 mg/ml = 3+ (6). The occurrence of these sensitivities, however, could not explain the worsening of his symptoms at work.

Case 2

A 44-year-old man suffering from increasing symptoms of itching in his eyes, rhinitis, and a non-productive cough for 4 years. Earlier he had no allergic manifestations. He has worked as a plant keeper for 8 years doing the same kind of work as Case 1. He also handles the weeping fig in the same manner. His symptoms are provoked when doing this work, but similar symptoms may occur while working with other plants and in dusty environments. This patient has clearly noted a reduction of his symptoms when off work at weekends and on vacation. The standard skin prick test was 3+ for birch and 2+ for mugwort and negative for other common allergens. There was no worsening of allergic symptoms during the pollen season.

Test results with weeping fig extracts

Extracts from weeping fig were made by cutting leaves and twigs into small pieces and extracting 1 g overnight in 9 ml physiological saline with 0.3 % phenol. Two control groups comprising 10 non-atopic, healthy persons and 10 atopic patients sensitized to common allergens were tested with the extracts. All of the non-atopic subjects and eight of the atopic showed negative skin prick tests (5) to both leaf and twig extracts. One of the atopic patients had a 1+ reaction to both leaf and twig and another 1+ to leaf extract. Both plant keepers showed strongly positive reactions. In Case 1 they were 4+ to leaf extract and 3.5+ to twig extract and in Case 2, 3.5+ and 4.5+, respectively.

0.1 ml of the allergen extracts 1/10 w/v was coupled to 20 CNBr-activated paper discs, and RAST (1, 8) was performed according to the manufacturer's instructions (Pharmacia Diagnostics AB, Uppsala). The discs were checked with a non-atopic serum with an IgE level of 4000 kU/l. There was a significant unspecific uptake which corresponded to approx. 0.4 PRU/ml. All RASTs were negative in the non-atopic control group. Nine of the patients in the atopic control group were negative to this allergen, while one of the skin-positive control patients had a weakly positive RAST (0.6 and 1.3 PRU respectively). In Case 1 the RAST was

Table 1

Results in skin test and RAST of weeping fig, and total IgE in two plant keepers, 10 atopic control patients and 10 non-atopic subjects. Skin prick test with histamine chloride 1 mg/ml = 3+

		Skin prick test		RAST (PRU)		Total IgE kU/l
		Leaf extract	Twig extract	Leaf	Twig	
Case 1		4 +	3.5 +	2.3	1.2	300
Case 2		3.5 +	4.5 +	6.3	13	970
Control group 10 atopics	Pat 1	1 +	1 +	0.6	1.3	1100
	Pat 2	1 +	neg	neg	neg	150
	8 pts	neg	neg	neg	neg	20-340
Control group 10 non-atopics		neg	neg	neg	neg	7.2-150

positive (class 2) for both leaf and twig (2.3 and 1.3 PRU respectively) and in Case 2 the RAST was class 3 (6.3 and 13 PRU respectively). The results of skin test and RAST, and the IgE concentrations are summarized in Table 1.

DISCUSSION

Allergy against weeping fig is not previously described. The reason may be that significant exposure is a relatively recent event. People nowadays use many more green plants in interior decoration, and weeping fig has become one of the most popular during the last decade. A new occupational group has emerged: plant keepers who have the responsibility for plants in various localities. We estimate that in the Stockholm area (ca 1 million inhabitants) there are about 100 persons involved in this occupation.

Both patients belong to this group. They handle the weeping fig in the same manner i.e. by shaking it vigorously. In this way the allergen becomes airborne, leading to sensitization of the respiratory tract. This is another example of the risk of sensitization which follows exposure to respirable antigen dusts such as detergent enzymes, coffee dust and isphagula (2, 3, 4, 9). Occupational allergy among green-house workers exposed to freesia and paprika plants have recently been described (7).

The skin responses to the extracts found in the atopic control group were weakly positive in two patients. One of them also had weakly positive RAST tests to weeping fig allergens. This patient had a comparatively high IgE level (1100 kU/l) which might have given unspecific uptake. However, a control serum with a higher IgE level gave a relatively low uptake. We therefore consider the result of the RAST to represent a true, although weakly positive test result. Skin prick tests more often give false positive results due to non-specific irritating effects or possibly the occurrence of lectins. Therefore, it is not unlikely that the single positive skin test to leaf extract observed in the second atopic control patient is a false positive reaction, even if this extract did not elicit any

reaction in the other eight atopic patients and the 10 non-atopic controls.

The first patient is strongly atopic, and thus, it is easy to imagine that exposure evoked allergic sensitization. The second patient was also atopic but to a lesser degree. It therefore seems that occupational exposure to weeping fig can cause allergy even in persons with low tendency to allergic disease.

The personal history of both patients strongly suggests a correlation between exposure to weeping fig and symptoms, but to obtain convincing documentation, provocation tests or careful monitoring of the patients with recording of symptoms and PEF measurements is necessary. After the preparation of this paper we have seen additional patients of the same profession and with similar symptoms in whom positive challenge tests with weeping fig extracts were found.

Persons working on premises with many green plants also represent a group that is exposed to allergen from weeping fig. The exposure and the risk of sensitization is probably considerably less, but a large number of persons are involved. Since one, possibly two, of the atopic control patients showed evidence of sensitization in spite of a low exposure the risk can not be considered negligible and is yet to be elucidated.

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