

Phytophotodermatitis caused by *Ficus pumila*

Marius Rademaker^{1,2} and José G. B. Derrai^{3,4}

¹Dermatology Department, Waikato Hospital, Hamilton, Waikato 3204, New Zealand, ²Tristram Clinic, 6 Knox Street, Hamilton, Waikato 3204, New Zealand, ³Liggins Institute, University of Auckland, Private Bag 92019, Auckland, New Zealand, and ⁴Disease and Vector Research Group, Institute of Natural Sciences, Massey University, Albany Campus, Auckland, New Zealand

doi:10.1111/j.1600-0536.2012.02026.x

Key words: allergic contact dermatitis; patch test.

There are over 750 species in the genus *Ficus* (Moraceae), most of which occur in the tropics or subtropics, varying in growth habit (from climbers to trees) and stature (from small shrubs to very tall rainforest emergents) (1). Numerous *Ficus* species are widely cultivated as ornamental plants, but *Ficus carica*, or the fig tree, is particularly valued for its fruit.

Ficus pumila is reported to be native to China, Japan, and Taiwan, but it is now cultivated in numerous countries around the world (2). It is commonly known as 'creeping or climbing fig', and is sought for its ornamental value as a creeper, often being used to cover vertical surfaces, such as walls and concrete structures (Fig. 1) (2).

In traditional medicine, *Ficus latex* has been used as an anti-helminthic (3, 4), and the leaves of *F. pumila* are used in folk medicine in China and Japan as an analgesic (5). However, the latexes of some *Ficus* spp. are known to cause phytophotodermatitis (6), a toxic reaction caused by direct skin exposure to certain plant compounds, followed by exposure to ultraviolet (UV) light.

Nonetheless, despite the relatively wide distribution of *F. pumila*, reports of dermatological reactions to this plant are extremely rare. We present here the first account of phytophotodermatitis caused by *F. pumila*.

Case Report

A 54-year-old man developed phytophotodermatitis 2 days after trimming a wall covered with *F. pumila* (Fig. 1c). The once-yearly task of trimming the creeping fig was usually performed delicately by his wife, with the aid of an electric hedge-trimmer. However, being a typical New Zealand male, he used a Stihl® petrol chainsaw instead. He wore eye and ear protectors, gloves, safety boots, long trousers, and a T-shirt. While he was trimming the creeping hedge, his forearms, antecubital fossae, neck and forehead were extensively splattered with small pieces of damaged leaves and stems of *F. pumila*. Although this task was performed at midday during mid-autumn, the UV index was still high, at 6–7.

Three days later, the patient noticed a slightly pruritic, punctate eruption on the radial aspect of the forearms and forehead, with more confluent eruptions over the antecubital fossae. Over the next 24 hr, the eruptions became purpuric, and then vesicular (Fig. 2).

Correspondence: Prof. Marius Rademaker, Dermatology Department, Hamilton, Waikato Hospital, Waikato 3204, New Zealand. Tel: +6478398944; Fax: +6478382032. E-mail: rademaker@xtra.co.nz

Conflicts of interest: The authors have declared no conflicts.



Fig. 1. *Ficus pumila*: (a) leaves (photo by F. Starr and K. Starr); (b) fruit and leaves (photo by F. Starr and K. Starr); and (c) creeping habit, entirely covering a wall (photo by M. Rademaker).

The eruptions slowly resolved over 6–7 days with the aid of clobetasol propionate cream.

Six weeks later, the patient noticed confetti-like hypomelanosis on the forearms, forehead, and neck, corresponding to the original dermatosis. This became largely repigmented over the course of 3 months, with no additional treatment or UV exposure.

Photo patch testing (with 5 J at D2) with 1 cm² (cut but not bruised) of a leaf of *F. pumila* gave positive results at D2 (+/–) and D4 (++) . Ordinary patch tests (without UV) showed a (+/–) reaction at D2 and no reaction at D4. Photo patch tests with similarly prepared leaves of both *F. carica* and *Ficus benjamina* gave negative results. Photo patch testing in 5 normal controls gave negative results, although these tests were performed with leaves harvested in winter.

Discussion

Although *F. pumila* is a common amenity plant, there are very few reports of adverse reactions in the literature. The plant was recognized to be an eye irritant as



Fig. 2. Confluent eruption over the anticubital fossae, showing early vesicle formation, 5 days after contact with *Ficus pumila* (photo by A. Yung).

early as 1920 (7). An Australian report described severe conjunctivitis caused by the sap of *F. tumila* [sic] in 4 men admitted to hospital, one of whom suffered permanent visual impairment in one eye (8). More recently, a Danish group described immediate urticaria-like reactions (9). Sporadic cases have been observed in Brazil, such as that of a 9-month-old girl who chewed or ingested part of an *F. pumila* leaf, and reacted promptly with intense crying and sialorrhoea; subsequent medical examination showed mild irritation of the oral mucosa, which resolved without complications (R. B. Oliveira, pers. comm. 2011).

In the Australian report, several men involved in the clearing and burning of *F. tumila* [sic] suffered contact dermatitis of various degrees, the symptoms of which varied from blotchy erythema to papulobullous eruptions (8). However, these reactions were not phototoxic, as the effects on the uncovered forearms were minor, in contrast to the more severe symptoms observed in the genital area, which were probably caused by sawdust or latex being carried down by sweat or inadvertent hand transfer during visits to the toilet (8).

F. pumila contains a number of sesquiterpenoid glucosides as well as triterpenes (10, 11). However, in the case of our patient, the reaction was probably induced by a furocoumarin, as two such compounds (bergapten and oxypeucedanin hydrate) have previously been isolated from this plant (12). Although photoallergic reactions are possible, phototoxicity is more usual. Two types of toxic reaction occur: one is oxygen-independent, where the UV-activated furocoumarins bind to RNA and nuclear DNA; another is oxygen-dependent, where the induced compounds cause cell membrane damage and oedema (6, 13–15). These reactions consequently lead to cell death (sunburned cells and apoptotic keratinocytes).

The reaction to UV light peaks 30–120 min after contact with furocoumarins (13). Bizarre configurations of erythema, oedema and bullae usually appear after 24 hr, and peak at 72 hr. However, in this case, the distribution of the rash was more in keeping with a 'string trimmer's

dermatitis' (16), reflecting the damage that the chainsaw inflicted on the plant. This is more commonly seen with Weed-Eater™-induced or Strimmer™-induced damage to lawns containing hogweed (*Heracleum sphondylium*) or cow parsley (*Anthriscus sylvestris*). Phototoxic reactions are more prevalent in mid-summer to late summer, when psoralen concentrations are higher, and more skin is exposed. Wet skin, sweating and heat all enhance the phototoxic response (13–15).

Hyperpigmentation often develops 1–2 weeks after the acute reaction, and may last for many months. This psoralen-induced hyperpigmentation occurs through increased melanocyte mitosis and dendricity, melanocyte hypertrophy, increased tyrosinase activity, and changes in the size and distribution of melanosomes (13). In this case, the patient developed hypomelanosis instead. Although the underpinning mechanisms are less clear, it presumably involved apoptosis of melanocytes.

Phytophotodermatitis resulting from contact with fig trees is well recognized (6). The leaves and unripened fruit of figs contain furocoumarins (psoralen and bergapten), as well as coumarins (umbelliferone, 4',5'-dihydroxy-psoralen, and marmesin) (6, 17). There has been some discussion as to whether the phytophotodermatitis is always phototoxic in nature, or whether photoallergy to 8-methoxypsoralen is also possible (18). In the present case report, the slower progression of the dermatitis, the predominance of itching over pain and the post-inflammatory hypomelanosis are more suggestive of this having been a photoallergic reaction.

In future, the management of the *F. pumila*-covered wall will be left to the patient's wife.

Acknowledgements

We thank Fernando B. da Costa and Rejane B. de Oliveira (Faculdade de Ciências Farmacêuticas de Ribeirão Preto, Universidade de São Paulo) for providing valuable information. We also thank Forest Starr and Kim Starr for kindly allowing us to reproduce their photographs.

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