

Primary sensitization to *Morus alba*

MORUS ALBA (MA) is a tree belonging to the Moraceae family. The involvement of MA pollen (MAp) in cases of respiratory allergy (1) and in contact urticaria has been recently reported (2).

The leaves of MA are deciduous, and are used to feed silkworms. The fruit, the mulberry (MAf), is occasionally eaten in Spain, where MA can be found as an ornamental tree. Our bibliographic search found no report of MA leaves (MAI) or fruit as a source of allergens.

The case of a 46-year-old woman is described. She had been previously diagnosed as having rhinitis and extrinsic asthma due to hypersensitivity to several pollens (*Olea europaea*, *Chenopodium album*, *Salsola kali*, and *Plantago lanceolata*) and oral allergy syndrome caused by fruits (Rosaceae). Apart from the MA pollination period, she developed several episodes of asthma when she was near MAI and then presented an anaphylactic reaction after eating a mulberry.

Prick tests with the usual pollens (ALK Abelló SA, Madrid, Spain) were performed, including MAp extract (5% w/v). As expressed by the largest diameter, the tests were positive to *Alnus* (10 mm), *Betula* (12 mm), *Olea* (5 mm), MAp (5 mm), *Salsola* (10 mm), *Chenopodium* (10 mm), and *Plantago* (6 mm). Prick tests with MAI and MAf (both 5% w/v) gave 7 and 11 mm, respectively. The prick test with natural fruits (Rosaceae) was positive with apple, peach, pear, cherry, and mulberry. In three control pollinosis patients, prick tests with MA extracts (pollen, leaf, and fruit) were negative.

The nonspecific bronchial provocation test (BPT) with methacholine was positive (PD₂₀ FEV₁ 7.5 UA). A specific BPT with MAp extract (10% w/v) and MAI and MAf (5% w/v) was performed after we had administered to the patient and the three control subjects an end-point prick test, beginning with the inhalation of the concentration that had produced a 3-mm wheal. This determined whether to begin the BPT with 1/100 MAp and 1/10 000 MAI and MAf extracts, which the patient inhaled as a flow volume (2 ml, 2 min) at 8 l/min. FEV₁ measurements after 10 and 20 min were performed. In the 30th min, an increased concen-

tration was administered if there was not a fall of more than 20% in the FEV₁. The late response was measured by measuring hourly the peak flow expiratory rate (PFER) during the following 24 h. An immediate response, not a late one, was observed with the three extracts. It was necessary to reach the MAp pure extract to obtain a significant fall of 20% in the FEV₁. The same response was obtained with 1/10 MAI and 1/100

The patient developed IgE antibodies to 10- and 18-kDa allergens of the Morus alba fruit, which have been shown to react with pollens and leaves and to cross-react with Betula pollen.

MAf extract dilutions. In the three control patients, all bronchial provocations were negative.

Specific IgE against some pollens and fruits was measured by RAST. With the MAI extract, it was class 1, and class 2 with the MAf one; when pollens were employed, it was class 0 for MAp and class 3 for birch; with fruits, it was class 2 for apple and peach.

Skin tests, specific IgE, and specific BPT determinations with MAp, MAI, and MAf extracts were concordant according to the degree of sensitization; RAST was less sensitive than prick or BPT. Its quantity has been related to the intensity of the skin reaction and the concentration producing a positive BPT (Table 1).

For the immunodetection study, *Betula verrucosa* allergenic extracts (BVp), MAp, MAI, MAf, peach (*Prunus persica*, PPf), and apple (*Malus domestica*, MDf) were employed. These were removed by SDS-PAGE (3). The removed proteins were electrophoretically transferred to PVDF paper (4), which was saturated with 5% BSA in PBS and then

Table 1. Prick test (mm diameter), RAST (class), and BPT (inhalatory concentration which caused significant fall in FEV₁)

	MAp extract	MAI extract	MAf extract
Prick	5	7	11
RAST	0	1	2
BPT	Puro	1/10	1/100

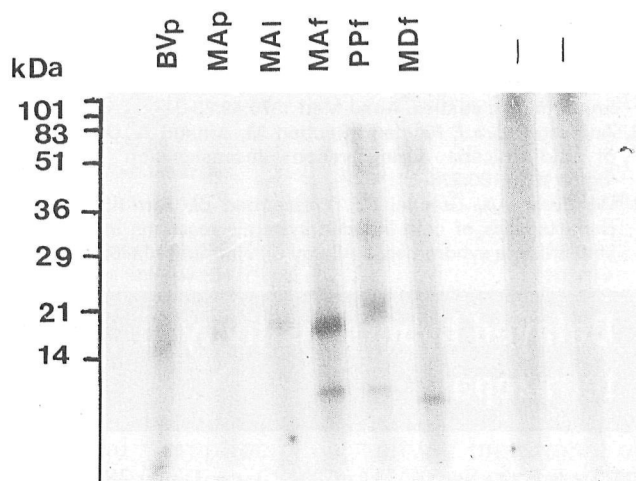


FIGURE 1 SDS-PAGE immunoblotting.

incubated with the patient's serum diluted to 1/3 with 5% BSA in PBS. Then this was incubated with 200 000 cpm of radioactively labeled human anti-IgE, and autoradiography was performed. As negative control (-strips), MDf and PPf extracts incubated with diluent instead of the patient's serum were used (Fig. 1). The more evident results were obtained with the three fruit extracts (MDf, PPf, and MAf). For MAf, two distinct allergenic bands were obtained with pm of about 18 and 10 kDa. The first band (18 kDa) was also detected with the BVp, MAI, and PPf extracts and less clearly with MAP. This is probably in accordance with the Bet v 1 allergen and homolog proteins. There was also a second band of 10 kDa in the MAf, MDf, and PPf extracts which did not seem to correspond to prophylines. In this respect, it has been reported that the most abundant allergen in peach skin has a pm of 10 kDa (5).

As a preliminary conclusion and contrary to what usually happens (6), this case record could be clinically explained as an initial sensitization to fruits (Rosaceae), developing specific IgE against 18- and 10-kDa proteins, which later gave rise to the symptoms after exposure to MA leaf or fruit and to skin sensitization to *Betula* pollen, an effect that usually passes unnoticed in our environment.

Key words: asthma; food allergy; cross-reactivity; *Morus alba*; mulberry.

A. M. NAVARRO*, J. C. ORTA, M. C. SÁNCHEZ, J. DELGADO, D. BARBER, M. LOMBARDO

*Unidad de Alergia
Hospital El Tomillar
41700 Dos Hermanas
Seville
Spain
Tel. 95-4596380
Fax: 95-4596500

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Wasp sting-associated cold urticaria

THE development of urticaria in certain subjects after exposure to cold was reported as early as 1866 Bourdon (1). The disorder is characterized by the development of urticaria and/or angioedema and sometimes painful burning plaques after exposure and may be classified as primary and secondary. A great variety of disorders have been described in the literature as associated with this condition, the most common being malignancies, systemic leukocytoclastic vasculitis due to cryoglobulinemia, and various infectious diseases. We describe a patient who developed cold urticaria (CU) during three periods of her life, each time

A patient with repeated episodes of cold urticaria after wasp sting.

after having been stung by a wasp, suggesting a causal relationship between wasp stings and CU.

A 44-year-old woman without a family history of CU presented at our department with complaints of hives appearing upon exposure to cold. She had experienced the same symptoms after cold water or rain exposure 26 years before after having been stung by a wasp. The symptoms resolved spontaneously after a few months until 11 years ago when she was restung by a wasp. The symptoms of CU recurred, worsened during the winter, and persisted for about a year.

Three months before, when she was doing well and had not had hives after cold exposure for about 10 years, she was restung by a wasp, CU recurring at the beginning of November. Exposure to cold

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