

Allergic asthma to psocids, a new indoor allergen of ecological building materials

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A 33 year-old non smoker woman with no history of atopy presented with rhinitis and conjunctivitis for 2 months, recently associated with evening cough and wheezing. She lived in a green house using ecological materials for insulation and heating. Her room was recently insulated with hemp. Pulmonary function testing showed reversible airway obstruction. Antihistamine, inhaled corticosteroid and long acting beta agonist dramatically decreased the symptoms. Skin prick test (SPT) for extracts from house dust mite, cockroach, moulds, pollens and hemp were negative. No specific IgE for house dust mite were detected by ELISA. The patient described little insects in her room, identified as psocids (*Liposcelis* sp.) by an entomologist. Skin prick test to psocid allergenic extract (total protein content: 2.4 mg/ml; ALK-Abelló, Courbevoie, France) was positive in our patient

Psocids are a new indoor allergen source in occidental houses, favored by ecological building materials.

(4 mm papule, T + 4 mm) and specific IgE to psocid extract were measured at 4.0 kUI/l by ELISA. These tests were negative in five control patients. Allergens, studied by SDS-PAGE and immunoblotting with the patient sera IgE antibodies, were identified at 40 kDa in non reducing conditions and four allergenic bands (28–50 kDa) in reducing conditions (Fig. 1). No specific IgE to tropomyosin from mites (Der p 10; Biomey, Vienna, Austria) were found by ELISA. Avoidance of hemp allowed suppression of psocids. Complete recovery was obtained, pulmonary functional tests normalized, treatments were stopped. No recurrence occurred after 6 years.

Psocids (booklice) are small insects found on bark, leaves or in caves. A few species, mainly *Liposcelis bostrychophila*, live in building materials or stored food stocks (1). Psocids can parasitize organic materials such straw, hemp and hessian in emerging countries, entomologic collections or stuffed animals, and represent potential profes-

sional allergens. Psocids infest 25% of indian dwellings (2), but were not described as indoor allergens of occidental houses until recently. Some recent unpublished reports described psocid detection in 90% of german or japanese houses (Franz JTh, Masuch G, Bergmann KCh, Mücken H, ERS 2001, Fukutomi Y, Kawakami Y, Taniguchi M, Saito A, Fukuda A, Yasueda H, Nakazawa T, Hasegawa M, Nakamura H, Akiyama K, EAACI 2010), especially in large and recent houses (3). In our case, psocid proliferation was probably related to an inappropriate use of hemp, directly layed in bulk. The role of psocids in allergic diseases was suggested in a few studies (2, 4) and unpublished reports (Fukutomi et al., EAACI 2010, Mücken H, Franz JTh, Fernandez-Caldas E, Maranon F, Masuch G, Bergmann KC, AAAAI 1998). A cutaneous sensitization was described in 7–20% of atopic patients by SPT (2, 4) and 42% of asthmatic patients by intradermal test (Fukutomi et al.). Specific IgE to

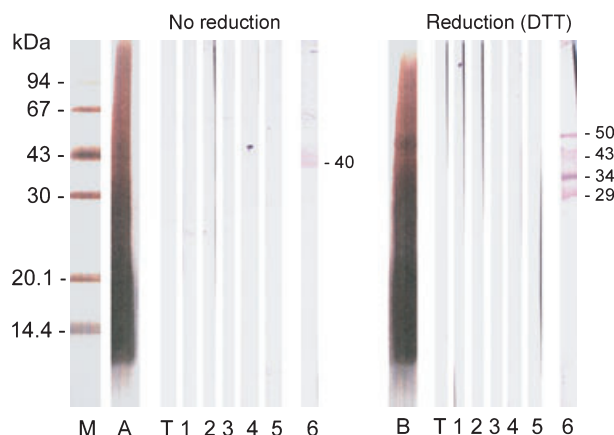


Figure 1 Allergens of psocid extract analyzed by SDS-PAGE and immunoblotting. Psocid extract proteins by silver staining, non reduced (A) or reduced by dithiothreitol (B). IgE immunoblotting incubated with control sera (1–5), psocid allergic patient (6), or blocking buffer (T).

Liposcelis sp. were found in 18–30% of patients with rhinitis or asthma (Fukutomi et al., Müsken et al.). However, the role of psocids in asthma was not proved. For the first time, we described both cutaneous and biological sensitization to a psocid extract and favorable outcome after eviction from the allergen, proving the role of psocids in the symptoms.

Cosensitizations with *Liposcelis* sp. were described (2) with *Dermatophagoides farinae* (62.5%) or cockroach (38.5%), potentially involving tropomyosin. Of notes, we did not find any cosensitization nor specific IgE to tropomyosin. Immunoblots of *Liposcelis* sp. extract in different studies found several protein bands between 27 and 67 kDa (2, 4). A 30 kDa protein was suggested as a potential major allergen (4), which may be involved in our case.

We report herein the first documented case of non occupational allergic asthma to *Liposcelis* sp, illustrating its role as independent indoor respiratory allergen. Use of new ecological building materials could favour development of new indoor allergenic sources.

Conflict of interest

Authors have no conflicts of interest related to the contents of the article.

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