

Housedust mites (*D. pteronyssinus*) in pets' beds and their relation to dust allergy

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Summary

Houses were surveyed by dust sampling to examine the occurrence and significance of storage mites in rural areas in the U.K. As a part of this project pets' beds were sampled, and it was discovered that not only do they contain storage mites, but that in nearly all instances the classical housedust mite (*D. pteronyssinus*) was present in significant numbers.

Introduction

In order to diagnose sensitivity to an allergen, as opposed to merely recording positive skin tests, it is necessary to observe the occurrence and distribution of the material concerned, and in the case of an animate allergen its own habitat must be fully appreciated and known. The significance of the presence of *D. pteronyssinus* in pet beds is considered and evaluated.

Materials and methods

The homes of eighteen subjects living in a rural area were visited by one of the authors (F.S.D.). Four regions of each house were surveyed, with several samples being taken from each site. The regions sampled were bedroom, living room and dry food store (cupboard or larder). Where pets were present, the pet's bed was also sampled. A vacuum cleaner (Electrolux cylinder type, 450 W) was used with material being collected in small paper bags, specially made from the standard paper used by the manufacturers for the dust bags. The bags were inserted in the distal end of the vacuum-cleaner hose, with the lips folded back over the tube, and then held manually during sampling. Approximately equal areas of each surface were sampled, with the hose end being moved at approximately 6 cm/sec and held at 90° to the dusty surface. Each sample represented about 2 min continuous collection. The samples were sealed within the bag with staples after folding over the open end.

The mites were then extracted by a modification of the method of Thind & Griffiths (1979). The full technique is given in a previous paper (Eaton *et al.*, in press).

Results

The distribution of *D. pteronyssinus* in the four sample areas for all houses is shown in Table 1. It will be seen that pets were present in eight houses, and their beds were sampled in seven. Pet beds associated with patient G.B. in particular, show a higher level of infestation with *D. pteronyssinus* than that of the owner's bed. The dog's bed was in the owner's bedroom. The incidence and species of mites found is shown in Table 2. It will be seen that with a single exception *D. pteronyssinus* was found in all pet beds sampled.

Discussion

The discovery by the authors that *D. pteronyssinus* was present in almost all pet beds, where storage mites or animal parasites were expected, prompts the question as to whether the housedust mite is not responsible for some of the allergenic reactions currently attributed to animal dander.

Fain (1966) describes *D. pteronyssinus* from birds' nests and from animal and bird skins as well as housedust. Several workers have reported its culture on animal scales, notably Spieksma (1966, 1976), van Bronswijk (1972) and Larson, Mitchell & Wharton (1969). Mumcuoglu (1976) in his survey of mite fauna of housedust in Switzerland reported the occurrence and relative abundance of *D. pteronyssinus* in the

Table 1. Distribution of *Dermatophagoides pteronyssinus* in four regions of a house

Patient	Bedroom	Lounge	Dry food cupboard of the kitchen	Pets' beds (when present)
C.B.	VH	M	—	—
G.B.	F	F	—	VH
D.B.	F	M	—	
K.B.	H	F	NS	
J.C.	F	F	—	F
S.C.	M	F	F	
R.C.	F	F	—	M
K.E.	VH	VH	—	H
O.F.	M	VH	—	—
B.K.	VH	VH	—	
L.M.	F	H	F	—
D.N.	VH	VH	—	—
E.P.	M	H	—	
S.R.	M	F	—	S
C.S.	F	VH	—	
S.S.	F	NS	NS	F
B.T.	F	F	—	F
I.W.	F	F	F	NS

F, M, H, VH = <20, 20–50, 50–100 and >100, mites per sample, respectively. NS = not sampled.

Table 2. Incidence of mites in pet's bed

Patient		<i>Dermatophagoides pteronyssinus</i>	<i>Oribatidae</i>	<i>Tarsonemus</i> species	<i>Tydeidae</i>	<i>Psoroptes</i> species	<i>Scutacaridae</i>	<i>Glyciphagus domesticus</i>	<i>Acarus</i> species	<i>Kleemannia</i> species	<i>Cheyletus</i> species	<i>Acarus farris</i>
B.T.	Cat + dog	F	F	F								
J.C.	Dog	F	F									
S.S.	Dog	F										
G.B.	Cat + dog	VH		F	F	F	F					
D.N.	Dog							F	M	F	F	F
K.E.	Dog	H		H								
S.R.	Dog	F	F					F				
R.C.	Cat	F	F					F				

F, M, H, VH = < 20, 20-50, 50-100 and > 100 mites per sample, respectively.

bedding of dogs and cats and of storage mites in that of other pets, especially those using straw as bedding, and drew attention to these additional sources of mite allergens. Cunningham, quoted in Blythe (1976) used Gaines meal, an American puppy food, as culture medium.

Prior to the discovery of *D. pteronyssinus* (Voorhurst, Spieksma-Boezeman & Spieksma, 1964) a number of factors have been examined as possible causes of housedust allergy. Moulds in dust have been considered, and McEwen (1967) showed that animal keratin in housedust extracts is only potent if it is aged. In 1970, Sinha, van Bronswijk & Wallace, drew attention to the relationship between mites and moulds and van Bronswijk & Sinha (1973) and Lustgraaf (1978) have established a clear relationship between *Aspergillus penicilloides* and *Aspergillus anstelodami* and the survival of *Dermatophagoides* in culture.

Although human skin scales almost certainly form the major part of the mite's food in housedust, other organic debris probably provides additional sources of nourishment.

There are several reports that animal danders (Rowe, 1927), Hampton & Cooke (1940), Sutherland (1945) and Stilwell, Rimington & Maunsell (1947) are implicated in housedust responsiveness. Stilwell noted that patients sensitive to animal danders are in addition almost invariably sensitive to housedust. It is suggested that as the presence of these mites in pet beds appears to be very common, clinical allergists should reappraise the relationship between pets and dust allergy in order to assess what proportion of the patients problem is due to the animal itself, and what to *D. pteronyssinus*.

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