

Group 1 and 2 *Dermatophagoides* house dust mite allergens in the microenvironment of cats

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Abstract

House dust mite allergens (HDMAs) are some of the most common allergens associated with allergic diseases in humans and dogs. The purpose of this study was to determine whether HDMAs could be detected in cat-associated household microenvironments. From 50 cat-only households with 95 cats, dust samples were collected by vacuuming for 2 min m⁻² from three areas where cats slept or rested regularly from September to October 2006. Relative humidity and temperature were measured in each household using a data logger. Each owner completed a questionnaire on potential factors that might influence the prevalence of house dust mites (HDMs). Dust samples were analysed utilizing an ELISA for Der p 1, Der f 1 and HDM group 2 allergens. In 38 of 50 households there was greater than 2 µg g⁻¹ of dust for at least one HDMA. Using stepwise logistic regression, factors associated with increased HDMA levels included: free-standing houses, number of humans in household, longhaired cats and age of the cat. Factors associated with decreased HDMA concentrations included: forced air heating and central air conditioning, less than 50% carpeting of the home, use of flea control, cats suffering from dermatological disease and the average temperature of the household. Many sleeping/resting areas utilized by cats contain sufficiently high levels of HDMAs to be potential sources of sensitization. This finding should lead to further determination of the role of HDMs in cats suffering from putative allergic conditions such as atopic dermatitis or asthma.

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Introduction

Atopic dermatitis (AD) is a chronic pruritic dermatitis, in which the majority of cases are associated with a type 1 hypersensitivity and the presence of cutaneous and/or circulating IgE specific for environmental allergens such as house dust mite allergens (HDMAs), storage mites, pollens, moulds and danders from animals and humans.^{1–6} In temperate climates the most common allergens implicated in human and canine AD are HDMAs.^{1,2} It is possible that the situation is similar in cats, but to the authors' knowledge there are no published studies specifically documenting the presence of HDMAs in households with cats only and in the immediate microenvironment of cats. Their likely involvement in the putative feline form of AD is also controversial. Reedy *et al.*⁷ first reported a condition known as feline AD, and, although still controversial, many dermatologists regard this as a common cause of pruritus and inflammatory dermatoses such as the eosinophilic granuloma complex in cats.

Several studies have investigated the biology, ecology and allergenic potential of HDMAs in humans and dogs.^{8–15} These have informed strategies for allergen avoidance, environmental control and specific immunotherapy used in the management of canine and human AD. The most common HDM species associated with human and canine AD are *Dermatophagoides farinae* and *D. pteronyssinus*. It is often assumed that the same is true in feline AD, and one study found that more than 80% of atopic cats had a hypersensitivity reaction to one or more HDMAs.¹⁰

Each HDM species possesses numerous antigens that may be involved in the pathogenesis of AD. A numerical nomenclature system has been developed to identify the species of origin and HDMA group type, for example Der f 1 and Der p 1, and Der f 2 and Der p 2 are the group 1 and 2 allergens from *D. farinae* and *D. pteronyssinus* respectively.¹⁶ These group 1 and 2 allergens can be isolated from HDM body parts and waste products, and are considered the major HDMAs identified in humans.^{16–18} However, unlike humans these are only minor allergens in canine AD where the major allergens are the high molecular weight group 15 and 18 allergens.¹⁶ Currently very little is known regarding the specific HDM species and HDMAs associated with feline AD, and there is still some controversy over the results from intradermal testing and serology.^{10,19}

The frequency of live HDM and the presence of HDMA vary with geographical location. Arlian and others^{20–22} studied several cities in North America with a temperate continental climate and found that *D. farinae* and *D. pteronyssinus* were most prevalent from July to October.

Other studies in more humid and coastal climates such as the United Kingdom found that *D. pteronyssinus* was the most prevalent of the two *Dermatophagoides* mites.^{9,10} In addition, regions with very low temperatures such as Iceland have very low concentrations of HDMAs and live mites.²³

House dust mite survival and production of HDMA within the immediate environment of hypersensitive patients is mostly affected by a series of microenvironmental climate factors.^{5,21,24,25} HDM proliferation and HDMA production is dependent on an abundant food source (dander and fungal spores), relative humidity (RH%; optimal range usually above 51%) and temperature (optimal range 20–30°C for *Dermatophagoides* species).^{20,24–26}

Numerous studies have found that beds and bedding are one of the primary sites for exposure of atopic humans to HDMAs.^{20,22,27–29} Recently, similar studies have revealed that there is a comparable pattern of exposure in dogs.^{10–13,22,29,30} The purpose of this study was to determine whether the sleeping/resting areas preferred by cats are likely sites for exposure to HDMAs, and if there were any household factors that could be associated with increased or decreased levels of Der f 1, Der f 2, Der p 1 and Der p 2.

Material and methods

Sample population

The households of 95 cats were selected at random in the mid-Michigan area based on the Michigan State University, Veterinary Teaching Hospital (MSU, VTH) patient database. The inclusion criteria were that the households had to contain at least one cat and that it was a cat-only household; households with dogs or other furred pet animals were excluded. A total of 50 households, with a total of 95 cats, were recruited. Each was sampled at three different locations within the house; the sample sites were not to be vacuumed or cleaned 5 days prior to collection. The sample sites were defined as the three locations where at least one cat within the household would rest or sleep the most in a 5-day period prior to the sampling date. Owners were asked to identify these areas to the investigator (K.E.L.) based on their knowledge of the animal's habits. An adult member of the household was asked to give a signed consent and to complete a written questionnaire on factors that have been identified as important for the survival and maintenance of HDM populations.^{4,12,20,26–29,31–33} The questionnaire asked for details regarding the specific characteristics of the cats [date of birth, breed of cat, fur coat type (short, medium and long), sex and if the cat was indoors or outdoors], housing structure (free-standing, apartment, townhouse or other), heating type (central versus noncentral), type of heat source (gas, electric, coal, wood, others) and heat distribution method (radiant, forced air, floor heating), cooling system (air conditioning – central, window unit or none), use of dehumidifiers (central, room units or none), number of floors within the home, with or without basement, level of bedroom and living room (ground level, etc.), type pile of carpet (low, medium or high), number of rooms with carpet (of the total number of rooms in household) and age of carpet (less than 1 year, over 1 year). The owners were also asked about the type and frequency of flea prevention and if any of the household cats had known allergies and, if so, to indicate a diagnosis and whether any specific allergy treatment was used. Similar questions about allergic conditions were asked about the human inhabitants of the households.

Sample collection

The 50 households were visited by one investigator (K.E.L.) to collect the dust samples between the first week of September and the first

week of October, as this has been shown to be the time of year with the highest prevalence of HDM at this location^{7,34}. The 150 dust samples were collected using a standard technique^{11–13,21–24}. Briefly, only the areas identified by the owners as above were sampled. The sampling was done by vacuuming for 2 min m⁻² for each site. In locations where the area was less than 1 m² the duration of vacuuming was reduced proportionally. The dust was collected by placing a Mitest® filter (Mitest filter; INDOOR Biotechnologies Inc., Charlottesville, VA, USA) in a dust trap (Mitest® dust collector; INDOOR Biotechnologies Inc.) placed over the nozzle of a Mighty Mini® vacuum cleaner (Mighty Mini®; Shop-vac Corporation, Williamsport, PA, USA). Each site was sampled with a new Mitest® filter. The samples were placed in sealable plastic bags and kept at –18 °C until analysed.

Quantification of HDMA

A standardized technique for the quantitative analysis of HDMA was applied¹². The dust samples were weighed and sieved (45 Micron Mesh Sieve; Endecott's Test Sieve Ltd, London, UK) and a sample of 100 mg fine dust used for analysis. In households where two of the vacuumed sites had yielded less than 100 mg of fine dust, all three vacuum samples were pooled into one larger sample for analysis purposes yielding a total of 63 samples for the final analysis. The fine dust samples were extracted overnight with 2.0 mL phosphate-buffered saline (PBS) 0.05% Tween 20 (PBS-T), pH 7.4, per 100 mg dust. For samples between 30 and 100 mg of dust, a proportional amount of PBS and PBS-T was added. The samples were centrifuged and the supernatants were removed for analysis.

Assays for the allergens Der f 1, Der p 1 and group 2 allergens were performed using a validated³⁴ ELISA test (INDOOR Biotechnologies Inc.). Microtitre wells (NUNC Maxisorp™ certificate 96 wells plates; Nalge Nunc International, Rochester, NY, USA) were coated with monoclonal antibodies specific for Der p 1 (1 mAb 5H8 stock solution 2 mg mL⁻¹ in PBS; INDOOR Biotechnologies Inc.), Der f 1 (1 mAb 6A8 stock solution 2 mg mL⁻¹ in PBS; INDOOR Biotechnologies Inc.) and group 2 allergens (anti-Group-2 capture mAb 1D8, stock solution 2 mg mL⁻¹ in PBS; INDOOR Biotechnologies Inc.) at 4 °C for 24 h. Each well was blocked for 1 h at room temperature with 100 µL 1% bovine serum albumin in PBS-T. 100 µL of 10-fold dilutions from 250 to 0.5 µg mL⁻¹ of purified reference solutions (Standard curve solutions; INDOOR Biotechnologies Inc.), 100 µL of the test samples and negative controls were added to the appropriate wells in duplicate. The plates were incubated for 1 h at room temperature before adding 100 µL of a 1/1000 dilution of biotinylated anti-group 1 or anti-group 2 (1 mAb anti-group 4C1 for Der p 1 and Der f 1, anti-group 2 1 mAb 7A1) to each well and incubated again for 1 h at room temperature. 100 µL of 250 mg L⁻¹ streptavidin-peroxidase (Sigma-Aldrich Corp., St Louis, MO, USA) was added to each well and the plates incubated for one more hour at room temperature. To develop the ELISA, 100 µL of 1 mM 2,2'-azino-di-3-ethylbenzthiazoline sulfonic acid (Sigma-Aldrich Corp.) in 70 mM citrate phosphate buffer pH 4.2 containing a 1/1000 dilution of H₂O₂ was added. The optical density (OD) was then read at 405 nm (BioTek 808; BioTek Instruments, Inc., Winooski, VT, USA). The reference solution was used to create a standard curve for each allergen and the concentration of each sample was extrapolated based on the standard curve. All samples and standard curves were run in duplicate on the same plates. The allergen concentration was expressed as µg g⁻¹ and a value of 2 µg or higher was considered positive.^{4,26}

Household relative humidity and temperature

In each household the average RH% and temperature were measured in one room for either the 5-day period prior to or following a dust sample collection. The owners of the cats were asked to place a data logger (HOBO U10 Temp/RH Logger; Onset Computer Corp., Bourne, MA, USA) device in proximity to one of the three sites that the cats used for resting and/or sleeping. The data logger was programmed to measure the RH% and temperature every 30 min for the 5-day period. The data were extracted (a total of 240 measurements per household) using the data logger software program (Hobo-

ware software; Onset Computer Corp.) and then exported into an Excel® worksheet (Microsoft Corp., Seattle, WA, USA) and the average, minimum and maximum RH% and temperature were calculated and used for further analysis.

Statistical analysis

Descriptive statistics were generated for data gathered from the questionnaire, dust samples and data loggers. Variables with high levels of missing values or with identical responses for all households were identified and excluded from analysis. Spearman Rank Correlation coefficients (SAS 9.1.3; SAS Institute Inc., Cary, NC, USA) were calculated to identify any potential collinearity or interactions between risk factors that would need to be taken into consideration during multivariable analysis. In situations where multiple risk factors were collinear, the less biologically important risk factors were excluded from multivariable analysis.

Multivariable regression was used to identify relationships between the presence of HDMA types (Der f 1, Der p 1 and group 2) and household risk factor variables. Separate logistic regression models (SAS 9.1.3) were developed, with each model outcome being one of the three HDMA types (yes/no). A forward model building approach was used, using the entry criteria of $P \leq 0.05$ for all risk factors entering the model and adding interaction terms when necessary to control for any interaction between risk factors. Associations between risk factors and HDMA types were reported as odds ratios (OR) with 95% confidence intervals. The OR were interpreted as increasing the risk of presence of the HDMA type if the ratio was greater than 1.0, and decreasing the risk if the ratio was less than 1.0.

Results

Sixty-three vacuum samples from 50 households were used in the data analysis. The characteristics of each home are summarized in Table 1. Nineteen of the homes were single cat homes (38%), with 31 (62%) homes having multiple cats (total of 95 cats in all homes). The majority of households (31 of 50 = 62%) were occupied by two or more human occupants. The most common type of home was free-standing (60%) followed by apartment (30%) and townhouse (10%), and 64% of homes had a basement. The most prevalent forms of heating were gas and central forced air in 80% and 68% of homes respectively. Some form of air conditioning was used in 92% of homes, with 22% having a window-mounted unit. The study did not investigate whether the air conditioner was used during the data collection period. Only 6% of households did not have a carpet; 94% had carpets older than 1 year, but in 70.2% of these less than 50% of the rooms in the house were carpeted. The average RH% was 50.6% (range 39.0–62.1%) and the average temperature was 20.4 °C (range 17.0–23.5 °C) in the 5-day period adjacent to dust collection.

The concentrations of HDMA obtained from the three sample sites in each home are shown in Table 2. As the amount of dust material collected from each sampling

Table 1. Descriptive statistics for sample sites with HDMA concentrations $\geq 2 \mu\text{g g}^{-1}$ dust

			No. with $\geq 2 \mu\text{g g}^{-1}$ dust		
	Variable name	Number of households ($n = 50$)	Der f1 ($n = 26$)	Der p1 ($n = 19$)	Group 2 ($n = 18$)
Population data	Single cat	19	11	9	8
	Multi cat	31	15	10	10
	Single-human household	19	9	8	8
	Multi-people household	31	17	11	10
	Owner allergies	28	14	9	10
House type	Free-standing home	30	15	13	11
	Apartment	15	7	2	3
	Townhouse	5	4	4	4
	Number of levels in home	2 (range 1–6)	N/A	N/A	N/A
	Basement	32	17	14	14
Central heat	Gas	40	22	16	16
	Oil	4	0	0	0
	Electric	6	4	3	2
	Adjunct heating (wood or coal)	8	1	2	2
Heating	Central forced air	34	18	13	12
	Radiant	13	8	6	6
	Floor	1	0	0	0
	Other	3	0	0	0
Air condition	Central	35	19	14	15
	Window unit	11	6	2	2
	Other or no reply	4	1	3	1
	Dehumidifier	16	9	7	7
	Humidifier	16	7	4	4
	Flea control (yes/no)	20	10	6	5
Flooring	Floor of bedroom (Integer)	1.7 (range 1–4)	N/A	N/A	N/A
	Floor of living room	1.1 (range 1–4)	N/A	N/A	N/A
	Carpet (short)	30	15	16	12
	Carpet (medium or long)	15	10	3	6
	No carpet	3	1	0	0
	Home with less than ($\leq 50\%$) carpet	33	17	9	10
	Carpet age (≥ 1 year)	47	23	19	18
Data logger	Average relative humidity (RH%)	50.6 (range 39.0–62.1)	N/A	N/A	N/A
	Average temperature ($^{\circ}\text{C}$)	20.4 (range 17.0–23.5)	N/A	N/A	N/A

HDMA, house dust mite allergen; N/A, not applicable.

Table 2. HDMA concentrations in house dust.

	HDMA concentration ($\mu\text{g g}^{-1}$ dust)	No. homes ($n = 50$)	No. pooled samples ($n = 63$)
Der f 1	<2	24	34
	≥ 2	26	29
	2–10	19	26
	≥ 10	9	10
Der p 1	<2	31	38
	≥ 2	19	25
	2–10	7	9
	≥ 10	12	16
Group 2 (Der f 2 and Der p 2)	<2	32	40
	≥ 2	18	23
	2–10	10	13
	≥ 10	6	10

HDMA, house dust mite allergen.

site was smaller than anticipated, the three samples were combined in 87 of 150 cases for a total of 63 pooled samples. In 70% of households the concentration of at least one of the HDMA tested was $>2 \mu\text{g g}^{-1}$ of dust. In 34% of households two HDMA were present at concentrations $>2 \mu\text{g g}^{-1}$, and in 22% all three HDMA were $>2 \mu\text{g g}^{-1}$. In addition, 11 households had Der f1, four homes had Der p1 and two had group 2 allergens as the only HDMA detected. In 15 households none of the dust samples had any HDMA at $>2 \mu\text{g g}^{-1}$ of dust. Of the 35 households with HDMA concentrations $>2 \mu\text{g g}^{-1}$, 24 had concentrations $\geq 10 \mu\text{g g}^{-1}$ of dust.

The regression analysis results are summarized in Table 3. The age of the cat(s) was associated with increased detection of both Der p1 and Group 2 HDMA (ORs 1.310 and 1.368 respectively), and short carpets were associated with increased detection of Der p 1 (OR 63.94). There was, in contrast, a decreased likelihood of

detecting group 2 HDMA in homes with less than 50% of the rooms carpeted (OR 0.699), and detecting Der p 1 and group 2 HDMA when flea control was practised (ORs 0.135 0.263 respectively, although the data did not permit analysis of individual flea control strategies.

Discussion

House dust mite allergens are ubiquitous allergens that have been reported to cause allergic reactions in many veterinary species, and have long been associated with AD in humans and dogs.^{1,3–6,8,9,11,12,14,18,21,22,29,35–37} As we were able to measure HDMA in the microenvironment of cats in concentrations above $2 \mu\text{g g}^{-1}$ of dust in their resting sites, this finding supports that HDMA are a possible source of potential sensitization in feline hypersensitivity disorders. It has been established that the $2 \mu\text{g g}^{-1}$ of dust of Der p 1 and Der f 1 correlates with 100 mites g^{-1} of dust and is a risk factor for sensitization in susceptible humans.²⁶ It should be made clear, however, that no such tolerance level or threshold for HDM and HDMA has been established in cats and this needs to be established in future studies.

We decided to use a commercially available test for detecting what are considered major allergens in humans with allergic diseases, although these are only minor allergens in dogs³⁵ and have yet to be identified as significant allergens in cats. Nevertheless, detection of Der f 1, Der p 1 and group 2 allergens serves as an indicator for the presence of HDMs in the time period prior to the sampling and therefore whether any potential cat-specific HDMA were present in the microenvironment. The influx of HDMA into any locality or microenvironments is a possible source of contamination, but several studies have shown HDMA to be a consistent marker of HDM

Table 3. Odds ratios for the association of household factors with the presence of HDMA (logistic regression analysis results of a stepwise forward regression analysis best model fit)

		OR		
Effect	χ^2	Estimate	95% Confidence limits	
Der p 1				
Carpet length (short)	0.0001	63.94	7.77	526.159
Average temperature	0.0003	0.63	0.496	0.8
Cat age (years)	0.0002	1.31	1.098	1.563
Flea control (yes)	0.0029	0.135	0.032	0.572
Free-standing house	0.0552 ^{NS}	4.072	0.922	17.978
		OR		
	χ^2	Estimate	95% Confidence limits	
Der f 1				
Hair coat of cat (long)	0.0028	6.904	1.745	27.321
Central air condition	0.0695	2.96	0.88	9.957
Cat dermatologic problem	0.0736 ^{NS}	0.319	0.111	0.914
		OR		
	χ^2	Estimate	95% Confidence limits	
Group 2				
Cat age (years)	0.0007	1.368	1.162	1.612
Number of humans in home	0.0021	2.823	1.595	4.997
Home with less than (≤50%)carpet	0.0081	0.699	0.497	0.984
Flea control (yes)	0.0432	0.263	0.078	0.887
Forced air heating	0.0253	0.238	0.065	0.871

OR, odds ratio; NS, statistically nonsignificant.

growth and can be reliably used to monitor for exposure to HDMAs.²⁶

We were not able to detect as many households with HDMA concentrations $>2 \mu\text{g g}^{-1}$ of dust as recent similar studies of the canine microenvironment,¹² despite sampling at the optimal time of the year.^{20,21,23} It is possible that this is partly due to the relatively small surface area sampled, because cats tend to rest or sleep curled up. In addition, many favourite resting sites included hard surfaces (window sills, wooden ledges, etc.) which would be less favourable sites for HDM growth compared to carpeted or upholstered areas. Further the previously published standardized sampling technique with 2 min of vacuuming per m^2 of surface tended to reduce the sampling time to less than a minute per site in the majority of our sample locations. This subsequently reduced the amount of dust collected per sample site and forced the pooling of 87 of 150 samples to achieve sufficient dust for ELISA analysis. In addition, a relatively low watt vacuum was chosen for the dust collection, as the initial protocol was to compare the HDMA concentrations to the number of live mites (the lower watt vacuum would preserve live mites). Unfortunately, this had to be abandoned due to the low volume of dust collected.

Important factors that were associated with an increased level of individual HDMAs included free-standing houses, number of humans in household, long-haired cats and age of the cat. Conversely, important factors that were associated with a decreased level of individual HDMAs included forced air heating and central air conditioning, less than 50% carpeting of the home, use of flea control, cats suffering from dermatological disease and the average temperature of the household. The age of the cat is likely to reflect how long a cat has been using the particular sleeping/resting location in each household and therefore the likelihood of creating a favourable microenvironment for the HDMs. The effects of short carpets (associated with increased HDMA recovery) and a home with less than 50% carpeted rooms (associated with decreased HDMA recovery) are similar to those reported in previous studies.^{20,21,29}

It was interesting that flea prevention was associated with lower levels of Der p1 and group 2 HDMAs, which is similar to that found by Raffan *et al.*⁹ The direct cause of this is not clear. It is possible that flea preventive products have a direct acaricidal effect on HDMs and their survival, as suggested in the studies by Swinnen and Wroom,¹⁴ although this is not yet a standard recommendation for HDM avoidance. Alternatively, it might be that the cats treated with flea prevention were more likely to be outdoor access cats and therefore spent less time in the sleeping/resting spots. This could result in less body heat, moisture and dander at the sampling site, and therefore a less favourable microenvironment for HDMs. The potential beneficial and/or protective effect of regular flea and tick prevention on HDMA levels should be investigated in more detail before making any recommendations. In several studies of preventative measures in human allergies and HDMA, the conclusion has been that although HDMA avoidance measure (encasing mattresses, HEPA filters, pet avoidance, etc.) can have significant improve-

ment on clinical symptoms and scores, the contribution of acaricidal treatments was limited.^{3,38–40}

We also found that the presence of cats with known dermatological conditions was associated with decreased levels of Der f 1, although the effect was nonsignificant. Analysis of this association was limited by the lack of specific data of the exact condition and any treatment. Further investigation of HDMA levels in homes with putatively atopic and/or asthmatic cats, and cats with other skin conditions under different treatment regimes is therefore warranted.

In conclusion, many sleeping/resting areas utilized by cats had detectable levels of HDMAs. This finding should lead to further determination of the role of HDMs in cats suffering from putative allergic conditions such as AD or asthma.

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Résumé Les allergènes d'acariens de poussière de maison (HDMAs) sont parmi les allergènes les plus fréquemment associés aux allergies chez l'homme et le chien. Le but de cette étude était de déterminer si les HDMA peuvent être détectés dans l'environnement des chats. A partir de 50 habitats de chats (comprénant 95 chats), des échantillons de poussière ont été prélevés par aspiration de 2 minutes/m², au niveau de trois aires de repos des chats, entre septembre et octobre 2006. L'humidité relative et la température ont été mesurées à l'aide d'un enregistreur de données. Chaque propriétaire complétait un questionnaire sur les facteurs potentiels pouvant influencer la prévalence des acariens de poussière de maison (HDM). Les échantillons de poussière ont été analysés par ELISA pour Der p 1, Der f 1 et les allergènes du groupe 2 d'HDM. Dans 38 des cinquante maisons, il y avait plus de 2 µg/g de poussière pour au moins un allergène. En utilisant la régression logistique par étape, les facteurs associés à l'augmentation des concentrations d'HDMA regroupaient : les maisons individuelles, le nombre d'habitants, la longueur du poil et l'âge du chat. Les facteurs associés à la diminution des concentrations d'allergènes regroupaient : le chauffage à air pulsé et l'air conditionné central, moins de 50% de surface au sol de moquette, l'utilisation d'antipuce, les chats atteints de troubles dermatologiques et la température moyenne de l'habitat. De nombreuses aires de repos utilisées par les chats contiennent des taux suffisamment élevés d'HDMA pour être des sources potentielles de sensibilisation. Ces résultats pourraient permettre une meilleure caractérisation du rôle des HDM chez les chats atteints de dermatite atopique ou d'asthme.

Resumen Los alergenos del ácaro domestico (HDMAs) son unos de los más comúnmente asociados con enfermedades alérgicas en humanos y en perros. El propósito de este estudio fue determinar si HDMAs pueden detectarse en microambientes caseros asociados con gatos. Se tomaron muestras de polvo de cincuenta hogares con 95 gatos mediante aspirado durante 2 minutos/m² en tres zonas donde los gatos dormían o descansaban de forma regular durante Septiembre y Octubre del 2006. Se midieron la humedad

relativa y la temperatura en cada vivienda utilizando un registro de datos. Cada propietario completo un cuestionario acerca de factores potenciales que pudieran influir en la prevalencia de ácaros del polvo (HDMs). Se analizaron las muestras de polvo mediante técnica de ELISA para los alérgenos Der p 1, Der f 1 y HDM grupo 2. En 38 de las 50 viviendas había más de 2 µg/g de polvo por al menos un HDMA. Utilizando regresión logística escalonada los factores asociados con un incremento de los niveles de HDMA incluyeron: casas aisladas, número de personas en el hogar, gatos de pelo largo y edad del gato. Los factores asociados con una disminución de las concentraciones de HDMA incluyeron: calefacción de aire forzado y aire acondicionado central, menos del 50% de moqueta en la casa, uso de agentes para controlar pulgas, gatos que padecían enfermedades de la piel y la temperatura media del hogar. Muchas de las zonas de descanso utilizadas por los gatos tenían niveles suficientes de HDMA para ser fuentes potenciales de sensibilización. Este hallazgo debe llevar a una mejor determinación del papel de los HDMs en gatos que sufren de condiciones alérgicas como dermatitis atópica o asma.

Zusammenfassung Hausstaubmilbenallergene (HDMAs) sind einige der häufigsten Allergene, die mit allergischen Erkrankungen des Menschen und des Hundes im Zusammenhang stehen. Das Ziel dieser Studie war es festzustellen, ob HDMAs im Mikromilieu von Haushalten mit Katzen festgestellt werden konnten. In 50 Haushalten, in denen nur Katzen lebten (insgesamt 95 Katzen) wurden von September bis Oktober 2006 Staubproben gesammelt, indem zwei Minuten lang pro m² an drei Stellen, wo die Katzen schliefen oder regelmäßig ruhten, gesaugt wurde. Die relative Luftfeuchtigkeit und die Temperatur wurden in jedem Haushalt mittels Datenlogger gemessen. Jede(r) BesitzerIn füllte einen Fragebogen über mögliche Faktoren aus, die die Prävalenz der Hausstaubmilben (HDMs) beeinflussen könnten. Staubproben wurden mittels ELISA auf Der p 1, Der f 1 und HDM Gruppe 2 Allergene untersucht. In 38 von 50 Haushalten wurden mehr als 2 µg/g Staub für mindestens ein HDMA gefunden. Durch Verwendung einer stufenweisen logistischen Regression wurden folgende Faktoren mit erhöhten HDMA Werten in Verbindung gebracht: freistehende Häuser, Anzahl der Menschen pro Haushalt, langhaarige Katzen und Alter der Katze. Faktoren, die mit erniedrigten HDMA Konzentrationen im Zusammenhang standen, waren: Gebläseheizung und Klimaanlage, weniger als 50% Teppiche im Haus, Verwendung von Flohprophylaxe, Katzen, die unter Hautproblemen litten und die Durchschnittstemperatur des Haushaltes. Viele Schlaf- bzw. Rastplätze, die von den Katzen benützt wurden, hatten genügend hohe HDMA Werte um eventuelle Quellen der Sensibilisierung darzustellen. Dieses Ergebnis sollte dazu beitragen, die Rolle der HDMs bei Katzen, die an vermeintlichen allergischen Erkrankungen wie atopischer Dermatitis oder Asthma leiden, weiter zu bestimmen.