

Dust mite species in the households of mite-sensitive dogs with atopic dermatitis

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Background – The presence of important house dust and storage mite species in the microenvironment of atopic dogs has not been thoroughly investigated.

Objectives – To compare the presence and population of five dust mite species (*Dermatophagoides farinae*, *Dermatophagoides pteronyssinus*, *Acarus siro*, *Tyrophagus putrescentiae* and *Lepidoglyphus destructor*) among households with mite-sensitive atopic dogs (Group A), households with clinically healthy dogs (Group B) and households without pets (Group C, $n = 25$) in Greece.

Animals – Twenty mite-sensitive atopic dogs and 20 clinically healthy dogs.

Methods – Dust samples were collected with a vacuum cleaner from owners' mattresses (all groups) and from dogs' sleeping areas (Groups A and B) or living room couch (Group C), once every season of the year. Following dust flotation, mites were counted and identified.

Results – *Dermatophagoides farinae* was the most prevalent (60, 40 and 64% in Groups A, B and C, respectively), followed by *D. pteronyssinus* (45, 35 and 48%, respectively), whereas the three storage mites were found in fewer households. No major differences could be found between Groups A and B or between households with (Groups A and B) and without dogs (Group C) regarding the presence or numbers of the five dust mite species.

Conclusions and clinical importance – The presence and population of five common house dust and storage mite species does not differ among Greek households with mite-sensitive atopic dogs, households with healthy dogs and households without pets.

Introduction

Canine atopic dermatitis (CAD) is currently defined as a genetically predisposed, inflammatory and pruritic allergic skin disease with characteristic clinical features, associated with IgE antibodies most commonly directed against environmental allergens.¹ Canine atopic dermatitis is becoming increasingly common in the everyday clinical practice, affecting up to 10–30% of the entire canine population,^{2,3} and is considered a good model for human atopic eczema owing to the many clinical and immunological similarities.⁴ Most dogs with CAD have IgE immunoglobulins against common environmental allergens (CAD *sensus stricto*) that can be detected using intradermal testing (IDT) and/or allergen-specific IgE serology (ASIgES).¹

Based on the high frequency of positive results of IDT and ASIgES, dust mites (DMs), such as the house dust mites (HDMs) *Dermatophagoides farinae* and *Dermatophagoides pteronyssinus*, and perhaps the storage mites (SMs) *Acarus siro*, *Lepidoglyphus destructor* and *Tyrophagus putrescentiae*, are considered the most important source of environmental allergens involved in the pathogenesis of CAD worldwide.⁵ The presence of these mite species or their allergens, such as *Der f1*, *Der p1* and *Dermatophagoides* group II allergens, in the bedding, skin, hair coat, household and dry food of clinically healthy dogs has been confirmed in previous studies.^{6–11} On the contrary, and to the best of our knowledge, the presence and the population of the different DM species in the microenvironment of mite-sensitive dogs with CAD has never been reported, and there is only limited information regarding the presence of HDM allergens⁹ and the guanine content¹² in the bedding and household of such dogs.

Mite-sensitive dogs with CAD have a higher frequency of positive IDT and ASIgES results to *D. farinae* than to *D. pteronyssinus*, even in areas of the world where the latter HDM seems to be predominant.^{5,13–16} Four mutually nonexclusive theories have been proposed to explain

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this discrepancy, as follows: (i) dogs may be exposed to a different spectrum of DM species than humans;^{8,15,17} for example, the presence of a dog may favour *D. farinae* over *D. pteronyssinus* either in the whole household or in the dog's sleeping area; (ii) *D. farinae* may be more allergenic than *D. pteronyssinus*, hence genetically predisposed dogs require exposure to lower allergen concentrations of the former mite to become sensitized;^{8,15,17} (iii) dogs with CAD are mainly sensitized to cross-reacting allergens of *D. farinae* and *D. pteronyssinus* that are more abundant in the *D. farinae* extracts used for IDT and ASIgES;^{8,18} and (iv) the *D. farinae* extracts used for IDT are irritant and lead to false-positive reactions.^{14,19,20}

The aim of this study was to examine the presence and population density of five different DM species (*D. farinae*, *D. pteronyssinus*, *A. siro*, *T. putrescentiae* and *L. destructor*) in the households of mite-sensitive dogs with CAD and to compare them with households of clinically healthy dogs and households without pets.

Materials and methods

Selection of households and dogs

Dust samples were collected from 20 households with mite-sensitive dogs with CAD (Group A), 20 households with clinically healthy dogs (Group B) and 25 households without pets (Group C), all located in the greater metropolitan area of Thessaloniki, Greece.²¹ The homogeneity of the three groups in terms of building, housing characteristics, living habits and cleaning practices has been previously reported.²¹

Briefly, Group A included six male and 14 female DM-sensitive dogs of various breeds with CAD and an age range of 1–10 years (median, 4.5 years).²¹ Canine atopic dermatitis was diagnosed on the basis of compatible history and clinical signs, positive IDT with a panel of 27 environmental allergens, positive ASIgES (ALLERCEPT; Heska Laboratories, Friebourg, Switzerland), fulfilment of at least three of the major and three of the minor diagnostic criteria proposed by Willemse,²² and the exclusion of adverse food reactions and other pruritic skin diseases (e.g. sarcoptic mange, otodectic mange, flea allergic dermatitis) or the persistence of pruritus after their elimination (e.g. bacterial pyoderma, *Malassezia* dermatitis).^{21,23} Additional inclusion criteria were as follows: (i) presence of perennial pruritus; (ii) indoor lifestyle and living in the present household for at least 1 year; (iii) positive IDT to at least one of the five DM species tested (*D. farinae* and *D. pteronyssinus* from Greer Laboratories Inc., Lenoir, NC, USA at 1/5000 w/v concentration; *A. siro*, *T. putrescentiae* and *L. destructor* from Artu Biologicals NV, Lelystad, The Netherlands at 100 Noon units/mL); and (iv) no historical evidence of previous parasitic mite infestations (e.g. sarcoptic mange, otodectic mange, cheyletiellosis) that may have caused false-positive IDT and ASIgES results.^{21,24–26} Seventeen of these dogs were the only pets in their households, while three of them lived together with a second, clinically healthy, dog.

Briefly, Group B included nine male and 11 female clinically healthy dogs, of various breeds, with an age range of 7 months to 16.5 years (median, 5 years).²¹ Inclusion criteria were as follows: (i) no historical evidence or evidence on physical examination of systemic or skin disease; (ii) indoor lifestyle and living in the present household for at least 1 year; and (iii) negative IDT for the aforementioned five DMs.²¹ All 20 dogs were the only pets in the household.

Group C included households without pets. These households belonged to relatives or friends of the Clinic personnel and to veterinary students.²¹

The study protocol and methodology were approved by the Ethical Committee of the School of Veterinary Medicine, Aristotles Univer-

sity of Thessaloniki. Also, written informed consent was obtained from the owners before the enrolment of their dogs in the study.²¹

Collection of dust samples, mite detection and identification

For each household, dust samples were collected from two sites, the owner's mattress (first sampling site) and the dog's sleeping area (i.e. dog bed or couch) for Groups A and B, or living room couch for Group C (second sampling site). For Groups A and B, the second sampling site was a dog bed (10 of 20 Group A and eight of 20 Group B households) or the living room couch (eight of 20 Group A and 10 of 20 Group B households). In the remaining cases (two of 20 in both groups), dogs slept on their owner's bed and consequently only one site from these households was sampled.²¹ The housing characteristics and the cleaning practices in both sampling areas did not differ among the three groups, apart from the higher frequency of feather beddings in Group A first sampling sites, the lower frequency of couch cases in Group C second sampling sites and the higher frequency of carpets in Group C second sampling sites.²¹

Dust samples were collected four times, corresponding to the middle of each season of the year (January, April, July and October), with a domestic 700 W vacuum cleaner (Hobby beetle, China). For each collection site, 1 m² was vacuumed for 2 min; samples were collected in separate paper bags with pores <40 µm, transferred into plastic containers, sealed and kept refrigerated (4°C) until analysed. All parts of the vacuum cleaner were thoroughly cleaned with warm water after each use. The residents were instructed to avoid cleaning the sampling sites for at least 7 days before each dust collection and to avoid the use of environmental acaricides or insecticides for as long as the study was in progress.²¹

Dust samples were mechanically sieved (Laboratory Test Sieve, AS200 Basic; Retsch GmbH and Co. KG, Haan, Germany) to remove large particles and weighed (Kern 770; Kern and Sohn GmbH).²¹ After applying the flotation technique,^{26–27} DM density was counted under a stereomicroscope,²¹ and expressed as the number of mites per gram of dust. DM species were identified based on their morphological features with the aid of a light microscope.²⁸ When species-level DM identification was not possible, they were classified by their genus or family. For the purposes of this study, 'unidentified mites', denoting those that do not belong to the five DM species of interest, were excluded from data analysis.

Statistical analysis

After calculating the average of all eight samples obtained from each household, the presence (Pearson's chi-squared test) and the population (Mann–Whitney *U*-test) of the five DM species were compared between Groups A and B, as well as between households with (Groups A and B combined) and without dogs (Group C). Statistical analyses were performed with SPSS 13.3 for Windows (SPSS Inc., Chicago, IL, USA) or STATXACT, version 7 (Cytel Inc., Cambridge, MA, USA), and *P* values of <0.05 were considered significant.

Results

All 20 Group A dogs were positive for *D. farinae* on both IDT and ASIgES; for the remaining four DM species, positive IDT and ASIgES results were recorded in 50–70 and in 70–100% of the dogs, respectively (Table 1).

Dermatophagoides farinae was the DM species found at a higher frequency in households of all three group (60% in Group A, 40% in Group B and 64% in Group C) and in both sampling sites, with the only exception being the owner's mattress in Group B (Table 2). *Dermatophagoides pteronyssinus* was found in fewer households (45% in Group A, 35% in Group B and 48% in Group C). None of the three SM species was found in more than 10% of the households, regardless of their group (Table 2). The

Table 1. Frequency of positive results using intradermal testing and serology for allergen-specific IgE in 20 mite-sensitive dogs with atopic dermatitis (Group A)

Allergen	Frequency (%) of positive results	
	Intradermal testing	Serology for allergen-specific IgE
<i>Dermatophagoides farinae</i>	20 of 20 (100%)	20 of 20 (100%)
<i>Dermatophagoides pteronyssinus</i>	10 of 20 (50%)	14 of 20 (70%)
<i>Acarus siro</i>	13 of 20 (65%)	20 of 20 (100%)
<i>Tyrophagus putrescentiae</i>	14 of 20 (70%)	20 of 20 (100%)
<i>Lepidoglyphus destructor</i>	11 of 20 (55%)	14 of 20 (70%)

Table 2. Presence [frequency (%)] of dust mites in dust samples collected on four seasonal occasions from the owner's mattress and the dog's sleeping area (or living room couch) of 20 households with mite-sensitive atopic dogs (Group A), 20 households with clinically healthy dogs (Group B) and 25 households without pets (Group C)

Mite species	Group A (n = 20)	Group B (n = 20)	Group C (n = 25)
<i>D. farinae</i>	12/20 (60%)	8/20 (40%)	16/25 (64%)
<i>D. pteronyssinus</i>	9/20 (45%)	7/20 (35%)	12/25 (48%)
<i>Dermatophagoides</i> spp.*	9/20 (45%)	4/20 (20%)	6/25 (24%)
<i>A. siro</i>	2/20 (10%)	—	—
<i>T. putrescentiae</i>	—	1/20 (5%)	—
Acaridae†	4/20 (20%)	—	1/25 (4%)
<i>L. destructor</i>	1/20 (5%)	1/20 (5%)	—
Glyciphagidae‡	—	1/20 (5%)	1/25 (4%)
Unidentified mites	16/20 (80%)	7/20 (35%)	9/25 (36%)

**Dermatophagoides* spp. are mites of the genus *Dermatophagoides* that could not be further identified to the species level.

†Acaridae are mites of the family Acaridae that could not be further identified to the genus level (*A. siro*, *T. putrescentiae* and other storage mites belong to this family).

‡Glyciphagidae are mites of the family Glyciphagidae that could not be further identified to the genus level (*L. destructor* and other storage mites belong to this family).

Table 3. Number of dust mites per gram of dust [range (median)] in samples collected on four seasonal occasions from the owner's mattress and the dog's sleeping area (or living room couch) of 20 households with mite-sensitive dogs with atopic dermatitis (Group A), 20 households with clinically healthy dogs (Group B) and 25 households without pets (Group C)

Mite species	Group A (n = 20)	Group B (n = 20)	Group C (n = 25)
<i>D. farinae</i>	0–438.8 (2.8)	0–112.3 (0)	0–19,247.5 (6.1)
<i>D. pteronyssinus</i>	0–139.6 (0)	0–260.8 (0)	0–219.2 (0)
<i>Dermatophagoides</i> spp.*	0–16.8 (0)	0–58.7 (0)	0–142.4 (0)
<i>A. siro</i>	0–1.4 (0)	—	—
<i>T. putrescentiae</i>	—	0–2.2 (0)	—
Acaridae†	0–31.4 (0)	—	0–13.8 (0)
<i>L. destructor</i>	0–1.8 (0)	0–14.8 (0)	—
Glyciphagidae‡	—	0–1.9 (0)	0–5.5 (0)
Unidentified mites	0–18.7 (2.6)	0–53.3 (0)	0–53.2 (0)

**Dermatophagoides* spp. are mites of the genus *Dermatophagoides* that could not be further identified to the species level.

†Acaridae are mites of the family Acaridae that could not be further identified to the genus level (*A. siro*, *T. putrescentiae* and other storage mites belong to this family).

‡Glyciphagidae are mites of the family Glyciphagidae that could not be further identified to the genus level (*L. destructor* and other storage mites belong to this family).

median number of all DMs per gram of dust was zero, with the only exceptions being *D. farinae* in Group A and C households and the identified mites in Group A (Table 3).

The presence of each of the five DM species was not significantly different between households with (Groups A and B combined) and without dogs (Group C; $P > 0.27$), as well as between Groups A and B ($P > 0.09$). Also, in the relevant comparisons of DM population, there was no difference ($P > 0.09$ and $P > 0.13$, respectively), with the exception of uncategorized Acaridae mites, which were found in higher numbers in Group A compared with Group B ($P = 0.038$).

Discussion

The results of IDT in mite-sensitive dogs with CAD showed an overall higher rate of sensitization to HDMs than to SMs and to *D. farinae* than to *D. pteronyssinus*. This was an expected finding based on the results of a previous study, in which IDT with allergen extracts from the same manufacturers and of the same concentration had been used to investigate the sensitization to environmental allergens of dogs with CAD that lived in the same geographical area.¹⁴ Interestingly, these results are in accordance with those of almost every other similar study performed in America, Asia, Australasia and Europe, regardless of the source and concentration of DM allergen extracts used for IDT.^{5,12,29–33}

The results of ASIgES also showed a higher frequency of sensitization to *D. farinae* compared with *D. pteronyssinus*, but a similar sensitization level to HDMs and SMs. In the field of veterinary science, such differences between the results of IDT and ASIgES are commonplace and have been attributed to many factors, but mainly to the fact that these two tests evaluate different entities (skin versus serum allergen-specific IgE) using a different methodology.³¹ Furthermore, based on the results of ASIgES, a comparable or even a higher rate of sensitization to SMs than to HDMs has previously been reported in atopic dogs, most of them having a similar lifestyle to that of our patients.^{5,16,31} As we have been able to demonstrate the presence of SMs in only a few Group A households (Table 2), the high frequency of positive ASIgES results for these mites could be attributed to their cross-reactivity with *D. farinae*, as previously shown by applying ELISA cross-inhibition.³⁴

Storage mites are nowadays less prevalent than HDMs in dust samples obtained from urban households throughout Europe,³⁵ which was also the case in all three groups of the present study. Among HDMs, *D. farinae* and/or *D. pteronyssinus* may be the predominant species in a particular area, depending mainly on the relative humidity in the microenvironment of mites.³⁶ In general, *D. farinae* seems to predominate over *D. pteronyssinus* mainly in dry and continental climates³⁷ and geographically as we move from the Atlantic coast towards the east of Europe.³⁶ To the best of our knowledge, the only available information on the mite fauna of Greek households comes from a research thesis³⁸ and a congress abstract,³⁹ both of which showed that *D. pteronyssinus* was more common than *D. farinae* in the mattresses of asthmatic patients living in the greater metropolitan area

of Thessaloniki and in another city (Larisa), located approximately 150 km to the south. As we have used the same methodology as those two studies, the differences in the results may further confirm the general change in the European continent over the last decade, where the longstanding predominance of *D. pteronyssinus* over *D. farinae* is no longer necessarily true.³⁶ The relatively large numbers of unidentified mites is not expected to have a major impact on these results, because there is no evidence that morphological distortions that preclude identification at the species level are more likely for any particular DM species.

The uncertainty of the possible detrimental, neutral or protective effect that keeping pets in the household could have on the development of human atopy^{40,41} would be further complicated if pets could influence the presence and populations of DMs in general or of particular DM species. This becomes particularly important if we consider the proposed interaction between the magnitude of human exposure to HDMs and animal allergens,⁴⁰ as well as the fact that not only the mere presence of a pet but also its commercial dry diet (possible source of SMs)^{11,42} may influence DM populations. The results of relevant studies have been inconsistent; some studies show increased HDM numbers and HDM allergen concentrations in households with pets, while other studies show that pet ownership has no such effect.^{37,43–46} It has already been proved that there is no difference in the frequency and density of total DMs between households with (Groups A and B, combined) and without dogs (Group C),²¹ and the present results show that the same also applies for the five DM species.

The only difference regarding the presence and population of DM species between households with mite-sensitive atopic dogs (Group A) and those with clinically normal dogs (Group B) was the higher density of Acaridae mites, the species of which could not be identified, in the former group. This finding is difficult to explain and may represent a type I statistical error (incorrect inference for a significant difference), because the number of dogs consuming commercial dry food was similar in both groups (data not shown) and no similar differences could be found by comparing the populations of *A. siro* and *T. putrescentiae*. On the contrary, if Acaridae (or a specific genus or species of this SM family) are truly present at a higher density in the households of mite-sensitive atopic dogs compared with those of healthy dogs, they may account, to a certain degree, for the sensitization and/or the flare-ups of some dogs with CAD. Further studies are needed to confirm this finding and then to identify Acaridae at the genus and species level using more sensitive and specific tests, such as molecular methods.

The infrequent presence of SMs in Group A households supports a conclusion that both ASIgES and IDT can show false-positive results to these mites in *Dermatophagoides*-sensitive atopic dogs.³⁴ On the contrary, the predominance of *D. farinae* over *D. pteronyssinus* is in line with the more frequent sensitization of Group A dogs to the former mite. When this study was originally designed, it was expected, based on the available information,^{14,38} that more mite-sensitive atopic dogs would have positive IDT and ASIgES results to *D. farinae*, which

was in fact the case, whereas *D. pteronyssinus* would be the predominant HDM, at least in Group C households, which was not the case. Additional studies in areas where *D. pteronyssinus* is the most prevalent HDM are needed to resolve the question of the most frequent sensitization of atopic dogs to *D. farinae*. Nevertheless, the results of the present study clearly show that the presence of a dog does not favour *D. farinae* over *D. pteronyssinus*, either in the whole household or in the dog's sleeping area, at least in those countries where *D. farinae* is the predominant HDM.

In humans, there is a dose-response relationship between the level of exposure to HDMs and sensitization and/or manifestations of asthma; the presence of ≥ 100 –500 mites/g of dust has been reported to increase the sensitization rate of genetically susceptible individuals.⁴⁷ The population density of *D. farinae* did not exceed 300 mites/g of dust in either of the two sampling sites, nor did it exceed 500 mites/g of dust when the results of both sites were averaged, and median values were always < 3 mites/g of dust (Table 3). Perhaps a lower HDM density is needed for sensitization and clinical expression of CAD,²¹ where the percutaneous route of exposure is more important,^{48,49} compared with that of human atopic asthma, where allergen inhalation plays a pivotal role.⁴⁷

The major drawbacks of the present study are the relatively small number of households that were sampled and the inherently low sensitivity of the direct methodology for DM detection compared with DM allergen testing.⁸ Although we have partly accounted for these problems by obtaining eight dust samples from each household and averaging their results, it would have been ideal also to test for DM allergens. However, such testing is not available for all five DM species, and measurement of *Dermatophagoides* group I and group II allergens may not be particularly relevant, because these are probably not major allergens for atopic dogs.^{50,51} Instead, major allergens for dogs include *Der f* 15 and *Der f* 18, which are not present in mite faecal pellets, and a novel *D. farinae* antigen called Zen-1.^{51–53} Commercially available assays for their measurement are not available and, as no information exists regarding the correlation of their concentrations in dust samples with those of group I or group II *Dermatophagoides* allergens, studies based on the latter may be misleading.

In conclusion, besides the large number of mites that could not be identified at the species level, *D. farinae* was found to be more prevalent than *D. pteronyssinus* in the microenvironment of mite-sensitive atopic dogs living in Greece. The presence and population density of five common DM species does not differ between households with mite-sensitive dogs with CAD, households with healthy dogs and households without pets. Sensitization and clinical manifestations of canine atopic dermatitis may result from exposure to very low house dust mite populations.

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Résumé

Contexte – La présence d'espèces importantes d'acariens de la poussière de maison ou de stockage dans le microenvironnement des chiens atopiques n'a pas été soigneusement étudiée.

Hypothèses/Objectifs – Comparer la présence et la population de cinq espèces d'acariens de poussière (*Dermatophagoides farinae*, *D. pteronyssinus*, *Acarus siro*, *Tyrophagus putrescentiae*, *Lepidoglyphus destructor*) parmi les habitations de chiens atopiques (groupe A), de chiens cliniquement sains (groupe B) et les habitations sans animal domestique (groupe C, $n = 25$) en Grèce.

Animaux – 20 chiens atopiques sensibilisés aux acariens et 20 chiens cliniquement sains.

Méthodes – Des échantillons de poussière ont été prélevés à l'aide d'un aspirateur sur les matelas des propriétaires (tous les groupes) et sur les lieux de couchage des chiens (groupes A et B) ou sur le canapé du salon (groupe C), une fois à chaque saison de l'année. Après mise en flottaison de la poussière, les acariens ont été comptés et identifiés.

Résultats – *Dermatophagoides farinae* était le plus prévalent (60%, 40% et 64% dans les groupes A, B et C, respectivement), suivi par *D. pteronyssinus* (45%, 35% et 48%, respectivement), alors que les trois acariens de stockage ont été trouvés dans peu d'habitations. Aucune différence significative n'a pu être trouvée entre les groupes A et B ou entre les habitations avec (groupes A et B) ou sans chiens (groupe C) pour la présence ou le nombre des cinq espèces d'acariens de poussière.

Conclusions et importance clinique – la présence et la population de cinq acariens de poussières communs et d'espèces d'acariens de stockage ne diffère pas entre les habitations grecques de chiens atopiques sensibilisés aux acariens, de chiens sains ou d'habitations sans animaux de compagnie.

Resumen

Introducción – la presencia importante de ácaros del polvo del hogar y de almacenamiento en el microambiente de perros atópicos no ha sido investigada a fondo.

Hipótesis/objetivos – comparar la presencia y el tipo de población de cinco especies del ácaro del polvo (*Dermatophagoides farinae*, *D. pteronyssinus*, *Acarus siro*, *Tyrophagus putrescentiae*, *Lepidoglyphus destructor*) entre las casas con perros atópicos sensibles a ácaros (grupo A), las casas con perros clínicamente sanos (grupo B) y las casas sin animales domésticos (grupo C, $n = 25$), en Grecia.

Animales – 20 perros atópicos sensibles a ácaros y 20 clínicamente perros sanos.

Métodos – las muestras del polvo fueron recogidas con un aspirador de los colchones de los propietarios (todos los grupos) y de las áreas donde dormían habitualmente los perros (grupos A y B) o del sofá de la sala de estar (grupo C), una vez en cada estación del año. Después de realizar la flotación del polvo, los ácaros fueron contados e identificados.

Resultados – *Dermatophagoides farinae* fueron los ácaros más frecuentes (un 60%, un 40% y un 64% en los grupos A, B y C, respectivamente), seguido por *D. pteronyssinus* (un 45%, un 35% y un 48%, respectivamente), mientras que los tres ácaros de almacenaje fueron encontrados en pocas casas. No se pudo encontrar ninguna diferencias importante entre los grupos A y B o entre las casas con (grupos A y B) y sin perros (grupo C) con respecto a la presencia o a los números de las cinco especies del ácaro del polvo.

Conclusiones e importancia clínica – la presencia y la población de cinco ácaros del polvo y de almacenaje no presentó diferencias entre los hogares de perros atópicos sensibles a ácaros, de perros sanos y de casas sin animales domésticos en Grecia.

Zusammenfassung

Hintergrund – das Vorkommen von wichtigen Hausstaub- und Vorratsmilben in der Mikroumwelt von atopischen Hunden wurde bisher noch nicht gründlich untersucht.

Hypothese /Ziele – Ein Vergleich des Vorkommens und des Bestandes von fünf Hausstaubmilbenspezies (*Dermatophagoides farinae*, *D. pteronyssinus*, *Acarus siro*, *Tyrophagus putrescentiae*, *Lepidoglyphus destructor*) in Haushalten mit milben-empfindlichen atopischen Hunden (Gruppe A), in Haushalten mit klinisch gesunden Hunden (Gruppe B) und in Haushalten ohne Haustiere (Gruppe C, $n = 25$) in Griechenland war das Ziel.

Tiere – 20 milben-empfindliche atopische Hunde und 20 klinisch gesunde Hunde

Methoden – Staubproben wurden einmal in jeder Jahreszeit mit einem Staubsauger von den Matratzen der BesitzerInnen gesammelt (alle Gruppen) und von den Schlafplätzen der Hunde (Gruppen A und B) oder der Couch im Wohnraum (Gruppe C). Nach Staubflotation wurden die Milben gezählt und identifiziert.

Ergebnisse – *Dermatophagoides farinae* war die prävalenteste Milbe (60%, 40% bzw. 64% in den Gruppen A, B bzw. C), gefolgt von *D. pteronyssinus* (45%, 35% bzw. 48%), während die drei Vorratsmilben in weniger Haushalten gefunden wurden. Es wurden keine großen Unterschiede zwischen den Gruppen A und B oder zwischen den Haushalten mit (Gruppe A und B) und ohne Hunde (Gruppe C) im Bezug auf das Vorkommen oder die Anzahl der fünf Staubmilbenspezies gefunden.

Schlussfolgerung und klinische Bedeutung – das Vorkommen und der Bestand der fünf häufigen Hausstaub- und Vorratsmilbenspezies unterscheiden sich nicht in griechischen Haushalten mit milben-empfindlichen atopischen Hunden, gesunden Hunden und in Haushalten ohne Haustiere.

要約

背景 – アトピー性皮膚炎の犬の環境中で重要であるハウスダストマイトと貯蔵ダニの存在は完全に解明されていない。

仮説/目的 – ギリシャにおいてダニ感受性アトピー性皮膚炎の犬がいる家庭（グループ A）、臨床的に健康な犬がいる家庭（グループ B）とペットがいない家庭（グループ C）で 5 種類の塵ダニ (*Dermatophagoides farinae*, *D. pteronyssinus*, *Acarus siro*, *Tyrophagus putrescentiae*, *Lepidoglyphus destructor*) の存在の有無と比率を比較した。

供与動物 – 20 頭のダニ感受性アトピー性皮膚炎の犬と 20 頭の臨床的に健康な犬

方法 – 埃のサンプルは飼い主のマットレス（すべてのグループ）と犬の寝床（グループ A と B）または居間のソファ（グループ C, $n = 25$ ）から掃除機で回収した。

結果 – *D. farinae* の検出頻度が最も高かった（グループ A, B, C でそれぞれ 60%、40%、64%）、次に多かったのは *D. pteronyssinus*（それぞれ 45%、35%、48%）であったのに対し、3 種の貯蔵ダニは家庭で見つかることは少なかった。ダニの存在の有無や 5 種の塵ダニの数に関して、グループ A と B の間に大きな差やペットの存在の有り（グループ A と B）と無し（グループ C）の間に違いは認められなかった。

結論と臨床的な重要性 – 5 種の一般的なハウスダストマイトと貯蔵ダニの存在と比率はダニ感受性アトピー犬、健康犬、ペットのいないギリシャの家庭において違わなかった。

摘要

背景 – 存在于异位性皮炎犬微环境中重要的户尘螨和储藏螨种类，尚未被彻底调查。

假说/目的 – 在希腊，挑选有螨虫过敏的异位性皮炎犬的家庭（组 A）、有临床健康犬的家庭（组 B）和没有宠物的家庭（组 C, $n = 25$ ），比较五种尘螨（美洲尘螨、欧洲尘螨、粗脚粉螨、腐食酪螨、害嗜鳞螨）的存在和数量。

动物 – 20 只螨虫过敏的异位性皮炎犬和 20 只临床健康的犬。

方法 – 用吸尘器从主人的床垫（所有组）和犬睡觉的区域（组 A 和组 B）或起居室沙发上（组 C）收集粉尘样本，当年每季一次。粉尘悬浮收集螨虫后，计数并鉴定。

结果 – 美洲尘螨存在最普遍（在组 A、B 和 C 中分别为 60%、40% 和 64%），其次是欧洲尘螨（分别为 45%、35% 和 48%），而在较少的家庭中发现这三种储藏螨。关于五种尘螨的存在及数量，在组 A 和 B 或有犬的家庭（组 A 和 B）和无犬的家庭（组 C）之间没发现显著差异。

结论和临床价值：在希腊的有螨虫过敏症犬、健康犬和无宠物的家庭中，五种常见户尘螨和储藏螨的存在和数量没有差异。