ORIGINAL

CHARACTERIZATION OF MITES IN SOFA DUST SAMPLES FROM HOMES IN CAMPINAS, SOUTHEAST BRAZIL

CARACTERIZAÇÃO DA FAUNA ACARINA EM SOFÁS DE RESIDÊNCIAS DE CAMPINAS, SUDESTE DO BRASIL

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ABSTRACT

We investigated the presence of mites in dust samples collected from sofas in 52 homes in the city of Campinas, SP by means of light microscope. The results showed that mites were present in 90.4% of the samples (n=47). The most prevalent families were Pyroglyphidae (mainly Dermatophagoides pteronyssinus) and Glycyphagidae (mainly Blomia tropicalis). A significantly higher mite count was observed in samples from houses (n=26) compared to apartments (n=26) (p<0.00005). In addition, a higher mite count was observed in carpets (n=19) compared to wood (n=19) or ceramic tile (n=14) floors (p<0.04).

***Index terms**: mite infestations, microscopy, housing sanitation.*

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RESUMO

Foi avaliada a presença de ácaros em amostras de poeira de 52 sofás de residências da cidade de Campinas, SP, através de microscopia ótica. Os resultados demonstram ácaros em 90.4% (n=47) das amostras. Observou-se predominância de ácaros das famílias Pyroglyphidae (sobretudo *Dermatophagoides pteronyssinus*) e Glycyphagidae (sobretudo *Blomia tropicalis*). Observou-se maior número de ácaros em amostras de casas (n=26) comparadas a de apartamentos (n=26) (p<0,00005), e quando carpete (n=19) estava presente, quando comparado com piso de madeira (n=19) ou cerâmica (n=14) (p<0,04).

Termos de indexação: infestações por ácaros, microscopia, saneamento de residências.

INTRODUCTION

House dust mites and storage mites contain allergens which can cause asthma and rhinitis symptoms in atopic individuals[1,2]. These arachnids are usually found on house dust samples collected from indoor sites like mattresses, pillows, sofas, and rugs[3]. Several studies have shown *Dermatophagoides pteronyssinus* (Pyroglyphidae) allergens in dust samples collected from sofas[4,5]. Simpson *et al*.[5] have recently observed high Der p 1 levels in dust samples from sofas. The aim of this study was to evaluate the mite fauna in sofa dust samples from homes in Campinas, Southeast Brazil.

MATERIAL AND METHODS

Samples were collected once from the upper surface of 52 sofas in the city of *Campinas*, Southeast Brazil (47°04'40'' W, 22°53'20''S; 680m above sea level). Samples were collected between February 1996 and June 1997. Each sofa surface was vacuumed for 2 min (covering approximately 1m^2) with a 1000W vacuum cleaner (Electrolux®, *Guarulhos*, Brazil). A piece of fine linen cambric (10×10cm) was placed over the distal opening of the suction hose. The larger particles in each dust sample were removed through a fine-mesh (500µm) sieve. The fine dust that passed through the sieve was weighed, cleared and mounted in Hoyer's medium before identification of the larvae, nymphs and adult mites (body count) under a light microscope.

An average of all dust amounts used on microscope slides was applied to estimate the total mite concentration in samples. This average was extrapolated to 1.0 gram of dust and values were corrected by L factor, obtaining total live mite concentration. The L factor represents previous analysis showing a 1:7 correlation of dead and live mites in dust samples (live mites represent only 12.5% of total count). The protocol was approved by the Ethics Committee of the State University of *Campinas* Medical School, according to Brazil Ministry of Health resolution 196/96.

Statistic analysis was performed using the non-parametric Mann-Whitney test, while Analysis of Variance and Fisher LSD method for specified linear combinations. The significance level was 5%[6,7].

RESULTS

Mites were found in 47 (90.4%) samples on microscope slides. The total number of mites and the estimated median concentration of living mites (mites per gram of fine dust - mites/g) were respectively 245 and 500 mites/g (range: 0 to 3,375 mites/g). House dust mites (Pyroglyphidae family) were the most frequently found mite group (n=188; 76.7%). Other observed mites were storage mites of the family Glycyphagidae (n=19; 7.7%), and the

glistening mites of Tarsonemidae family (n=11; 4.5%). Mites of the Cheyletidae (n=8; 3.3%) and Acaridae (n=7; 2.8%) families, among others, were also found (Table 1). A total of 138 mite eggs were observed in the samples.

Table 1. Mite bodies in dust samples collected from 52 Brazilian sofa surfaces between February 1996 and June 1997.

Mite Families	n	%
Suborder Acaridida	214	87.3
• Family Pyroglyphidae	188	76.7
Larvae	46	18.8
Dematophagoides sp. - nymph	58	23.7
Dematophagoides pteronyssinus	69	28.2
Dematophagoides farinae	6	2.4
Euroghyphus maynel	7	2.8
Pyroglyphus africanus	2	0.8
• Family Glycyphagidae	19	7.7
Larvae	3	1.2
Blomia tropicalis	15	6.1
Chortoglyphus arcuatus	1	0.4
• Family Acaridae	7	2.8
Tyrophagus putrescentiae	5	2.0
Suidasia nesbitti	1	0.4
Suidasia pontificiae	1	0.4
Suborder Actinedida	25	10.2
• Family Tarsonemidae	11	4.5
• Family Cheyletidae	8	3.3
• Family Eriophyidae	2	0.8
• Family Demodicidae	2	0.8
• Other Actinedida mites	2	0.8
Suborder Oribatida	5	2.0
Suborder Gamasida	1	0.4
• Superfamily Uropodoidea	1	0.4
Total of eggs	138	100.0
Total of mites	245	100.0

Dermatophagoides pteronyssinus was the most prevalent mite in dust samples (82.1% of Pyroglyphidae adult mites), and *Blomia tropicalis* (Glycyphagidae) was the most frequent storage mite found, representing 6.1% of total mite count. Additionally, 90.4 (n=47) of dust samples had more than the proposed limit of 100 mites/g for human sensitization, whereas 40.4% (n=21) of samples had more than 500 mites/g. Insect parts, mainly of ants (Formicidae) and lice (Phthiraptera), were also observed in the samples.

There was a significantly higher number of house dust mites compared to all other mite families. No statistical difference was observed among the different types of sofa upholstering materials. Furthermore, no difference was observed on mite count when drapes or domestic animals were present in the living room. There was, however, a significantly higher mite count in samples collected from houses (n=26) compared to apartments (n=26) (p<0.00005), and when fitted carpet (n=19) was present, compared to wood (n=19) or ceramic (n=14) tile floors (p<0.04).

DISCUSSION

Sofas are widely used in Brazil. In the present study, sofas, which were for the most part covered with fabric, showed to be an indoor site highly infested with mites, and should be more carefully investigated. Data herein also showed that many sofas were also infested by insects (mainly ants). It is not known whether insects have an influence on the number of mites.

Data reports on sofas mite content commonly reveal only few *Dermatophagoides* specific allergen levels[4,5]. The optic microscopic method used in this study allowed a specific and detailed analysis of sofa dust samples, including the analysis of other mites such storage and glistening mites. Fifty-two samples were analyzed, showing a total of 245 different mites and 138 mite eggs. The most prevalent was the *Dermatophagoides pteronyssinus* mite.

House dust mites and storage mites have been associated with human sensitization. There are many different indoor sources of mite allergens, usually mattresses, pillows, sofas, and rugs. Furthermore, storage mites are frequently found in house dust samples from tropical areas, including Brazil. Despite the fact that Campinas shows high air humidity (40% to 90%) and temperature (average 25° C) annual

rates that benefit the reproduction of house dust mites, storage mites represented only 10.6% of the total sofa mite number.

We concluded that sofas are an important source of mite allergens, since most samples showed a high concentration of house dust mites. Data herein do suggest that if sofas are placed in rooms with solid floors, they will harbor fewer mites. This advice should be emphasized to atopic individuals.

REFERENCES

1. Platts-Mills TAE, Thomas WR, Aalberse RC, Vervloet D, Chapman MD (Cochairmen). Dust mite allergens and asthma: report of a Second International Workshop. J Allergy Clin Immunol 1992; 89:1046-60.
2. Ambrózio LC, Baggio D, Mori JC, Fernandes MFM, Kase MT, Mello JF. Suidasia pontificia: alergizante de vias respiratórias? Investigação preliminar de antígenos de outros gêneros de ácaros da poeira domiciliar. Rev Bras Alerg Imunopatol 1989; 12:15-23.
3. Binotti RS, Muniz JRO, Paschoal I, do Prado AP, Oliveira CH. House dust mites in Brazil - an annotated bibliography. Mem Inst Oswaldo Cruz 2001; 96:1177-84.
4. Custovic A, Simpson B, Simpson A, Hallam C, Craven M, Woodcock A. Relationship between mite, cat, and dog allergens in reservoir dust and ambient air. Allergy 1999; 54: 612-6.
5. Simpson A, Simpson B, Custovic A, Cain G, Craven M, Woodcock A. Household characteristics and mite allergen levels in Manchester, UK. Clin Exp Allergy 2002; 32:1413-9.
6. Levin J. Estatística aplicada a ciências humanas. 2.ed. São Paulo: Harbra; 1987. 392p.
7. Rodrigues PC. Bioestatística. 3.ed. Niterói: Editora UFF; 2002. 337p.

Recebido para publicação em 30 de outubro e aceito em 31 de outubro de 2003.