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**Test results of the effectiveness of Delphin vacuum cleaner
in removal of housedust mites from hotel room beds**

A TEST REPORT

customer: Special Clean Room Kft., 1042 Budapest, Lebstuck M. u. 53. 3/20.	
location: Hotel Europa, Hárshegyi út 5-7. 1021 Budapest, Hungary	
sampling: 03. Dec. 2009., 07. Jan. 2010.	results: 15. Jan. 2010.

Aims

The aim of this study was to test the effectiveness of regular use of Delphin vacuum cleaner (a device using water and L-lamella separator) in removal/reduction of house dust mite population (*Dermatophagoides* spp.) from hotel room beds.

Materials and methods

Delphin vacuum cleaner (800 W, 2 m³/s) has been used regularly (according the housekeeping protocol of the cleaning company) on the upper part of 7 hotel room beds. The beds have been cleaned by conventional vacuum cleaners before the test with the same regularity. To measure housedust mite concentration, dust samples were collected before and after the treatment from the mattresses, using a filter in the Delphin vacuum cleaner (03. Dec. 2009. 40 × 40 cm, 1 min; 07. Jan. 2010. 80 × 80 cm, 2 min, **Fig 1.**). According the recommendations published in the literature (Manjra et al., 1994; Haouichata et al., 2001.) a colorimetric method for the determination of guanine concentration was performed following the manufacturer's instructions (ACAREX[®]-Test, Werner & Mertz GmbH, Mainz, Germany, **Fig 2.**).

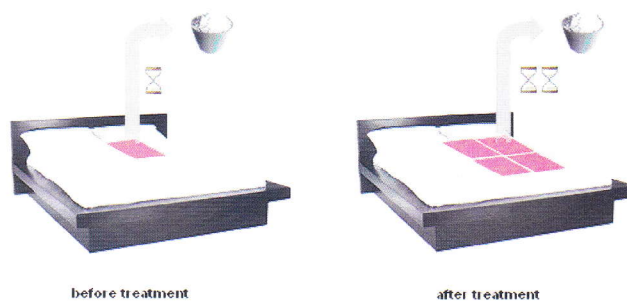


Fig 1. Although the beds has been cleaned regularly by conventional vacuum cleaners before this study, one month after the treatment with the Delphin vacuum cleaner the dust content was strongly decreased. The device was so effective that there was not enough dust content in the beds to collect the same amount of the samples for the test than before the tretment, only by increasing the sampling area and time (4 and 2 times, respectively).

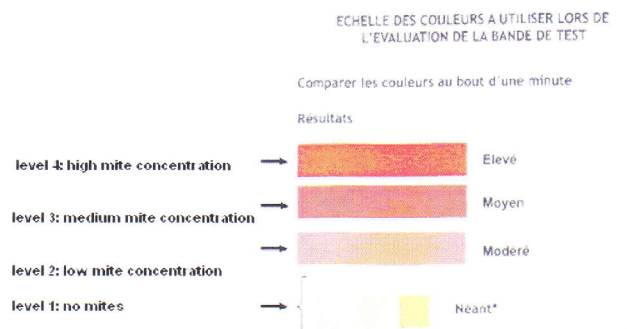


Fig 2. Concentration levels of ACAREX[®]-Test

Results

Mite concentration of the beds were low even before treatments (level 2 in all samples, max: level 4). After the treatment the mite concentration levels were 2 in 6 samples and 1 in one sample. It was found that the colour depth was reduced within the level 2, however such results could not be evaluated due to the lack of literature available on this subject.

Discussion

Low mite concentrations were measured in beds even before treatments, possibly because indoor environmental conditions was not favorable for mite reproduction and population growth. The evenness of mite concentration levels in beds could be explained by the uniform bed material, house keeping protocol and frequent change of bed users (hotel guests). We suppose that the strong reduction of the total amount of dust may lead to the reduction of total mite content. To detect this reduction, however, more expensive methods, like enzyme-linked immunosorbent assay (ELISA) seems to be adequate. Intensive vacuum cleaning may remove large amounts of dust reducing mite concentration (Woodcock és Custovic, 2000). Therefore, dust removal is essential to keep low mite allergen levels in beds by eliminating populations and reducing mite's food supply.

Literature:

Haouichata H, Paulia G, Otta M, Hedelinb G, de Blaya F, Vérota A, Bessota JC (2001): Controlling Indoor Mite Exposure: The Relevance of the Acarex Test. *Indoor and Built Envir.* 10(2): 109-115

Woodcock A and Custovic A (2000): Allergen avoidance: does it work? *Br. Med. Bull.* 56(4):1071-1086.



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