

Bacterial contamination in hotel rooms during the cleaning activity

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MATERIALS and METHODS



Fig. 1 – Air sampling with Millipore air Tester



Fig. 4 - Incubate at 30 ° C for 7 days



Fig. 2 – Surface swabs sampling

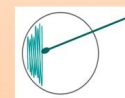


Fig. 3 – Inoculation on TSA

Twelve air samples of 250L were collected through an impactation method, in the TSA medium (Tryptic Soy Agar) with nystatin (0.2%). Surface swab samples were also collected side-by-side and inoculated on TSA. All the collected samples were incubated at 30° for 7 days.

INTRODUCTION

Some studies point to human activities as one of the responsible for most bacterial concentration [1,2].

However, there is no information regarding bacteria contamination in hotel room during the cleaning activity.

OBJECTIVE

This study aims to assess and characterize the occupational exposure of bacterial contamination in hotel rooms, more precisely in a room with carpet floor and another room without carpet, during the cleaning activity.

RESULTS and DISCUSSION

- The bacterial concentrations in room's indoor air were mostly higher than the detected outside (Table 1). This result was also found in other studies^[3].

Location	Room type	CFU/m ³	
		With carpet	Without carpet
Room before the activity with windows closed		268	40
Toilet before cleaning		100	28
Room - take the laundry out of bed		396	428
Toilet cleaning		152	272
Room - make the bed		240	432
Room - aspire		256	116
Outdoor		24	112

Table 1. aerosolized bacterial concentrations, by room type

- The surface samples indicated bacterial concentrations ranging from 1x10⁴ to 3x10⁶ CFU/m² in the room with carpet, and from 7x10⁴ to 1x10⁷ CFU/m² in the room without carpet.
- The activity with the highest bacterial contamination in the air is take the laundry out of bed, in both rooms.
- The prevalent morphotype (90%) isolated from indoor airborne microbiota in both room types was Gram-positive, catalase-positive cocci. Bacterial isolates belonging to the type Gram-negative rods were only detected in the room with carpet.
- As in other studies, the gram-positive bacteria were the most common type found both inside and outside. The presence of gram-negative bacteria in indoor air can be related to human activity [1].

- Room type seems to be not significant (p = 0.217) for bacterial concentration, but the room without carpet indicated to be 2.4 more probable (OR = 2,429) to have microorganisms from the morphotype Gram-positive cocci. The sample type (air or surface) indicated to be not significant (p = 0.103) to bacterial concentration, however it was found a trend that the surfaces presents 5 times (OR = 5,754) more probability to have Gram-positive cocci.

CONCLUSION

The results do not indicate the type of floor (with or without carpet) is a factor of the increase of microbial load.

The activity of taking the bedclothes, indicated to be the one that originated the highest bacterial air concentration.

Further investigations should include products and cleaning procedures.

[1] - Zhu, H. et al. (2003). Experimental study of indoor and outdoor airborne bacterial concentrations in Tempe, Arizona, USA. *Aerobiologia*, 19, 201–211. doi:10.1023/B:AERO.000006571.23160.8a.

[2] - Fang, Z. et al. (2007). Culturable airborne bacteria in outdoor environments in Beijing, China. *Microbial Ecology*, 54, 487–496. doi:10.1007/s00248-007-9216-3.

[3] - Kuo n.W., Chiang h.C., Chiang c.M. (2008). Development and application of an integrated indoor air quality audit to an international hotel building in Taiwan. *Environmental Monitoring and Assessment*. 147, 139–147.