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NIOSH 0800

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CSR

CFU/m³

CSR

.....

.....

.....

.....

ICU

CFU/m³

.....

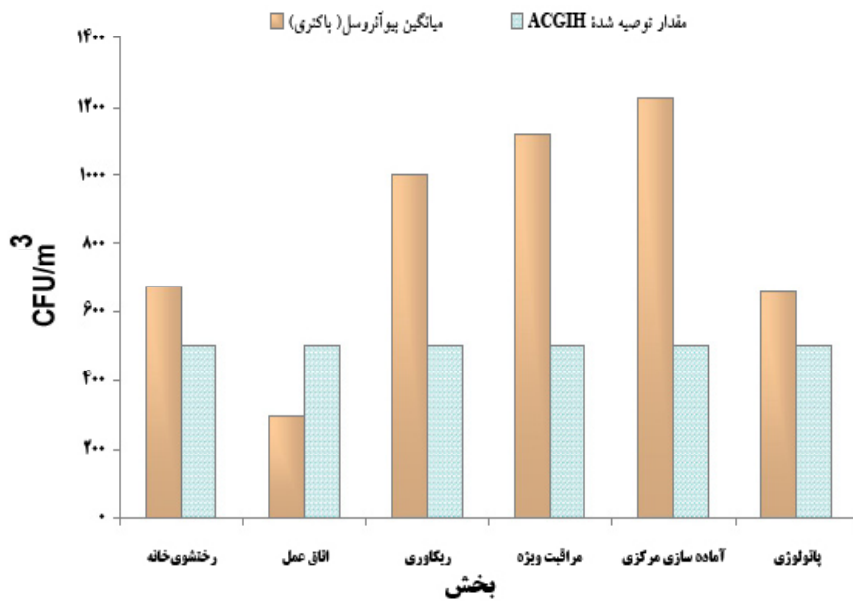
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CFU/m³ ACGIH

CFU/m³ ACGIH



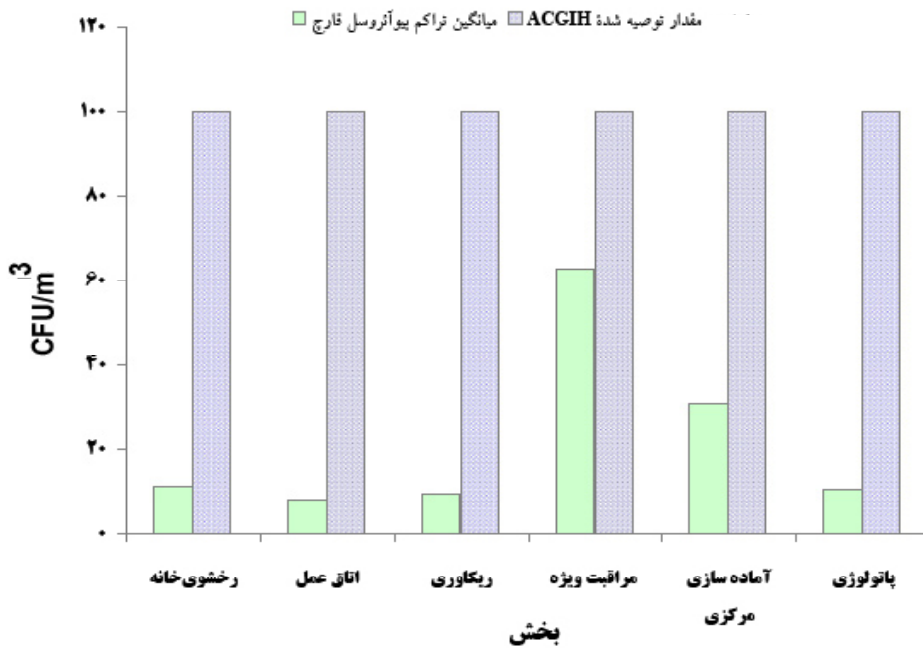
ACGIH مقدار توصیه شده ACGIH

($P=0.001$, $FSD=7.44$) / CFU/m^3 (Mean Bioaerosol (Bacteria))

ACGIH مقدار توصیه شده ACGIH

ICU (Mean Bioaerosol (Bacteria))

($FSD=75.05$) / CFU/m^3 (Mean Bioaerosol (Bacteria))



ACGIH مقدار توصیه شده ACGIH

ICU / CFU/m³
/ (CFU/m³ L

yy / (CFU/m³ L
" / (CFU/m³)

NIOSH
yy "

(yy CFU/ m³ L
ICU : "

"

yy- y CFU/m³
ICU CSR

CSR yy-

"fl) ICU

CFU/m³

yy- CFU/m³ yy-
"fl L

L

" : fl"

"

"

fl Bacillus cereus)

"

"

"fl=yy/yy L

fl L
Scheffe

ICU
" fl=yy/y)

ACGIH fl L
fl yy CFU/m³)

"

fl L

O

O O

O O O

"

CFU
yy/ CFU
" ICU

O O

O O

ICU CFU
"

"

fl L

CSR

"High Risk"
 ICU
 CFU/m³
 ACGIH
 ICU
 CFU/m³
 ICU
 CFU/m³
 Kim KY
 CFU/m³
 CFU/m³
 ACGIH
 ICU
 CFU/m³
 ICU
 CFU/m³
 ICU
 CFU/m³
 ICU
 CFU/m³
 ICU
 CFU/m³
 ICU
 CFU/m³
 ICU
 CFU/m³

در سال ۱۳۹۱ با کد ۴۵۷۹ است که با حمایت دانشگاه علوم پزشکی و خدمات بهداشتی تهران انجام شده است.

منابع

1. Nevalainen A, Pastuszka J, Liebhaber F, Willeke K. Performance of bioaerosol samplers: collection characteristics and sampler design considerations. *Atmospheric Environment*. 1992;26(4):531-40.
2. Cox CS, Wathes CM. *Bioaerosols Handbook*. New York: Lewis Publishers; 1995.
3. Levetin E, Burge H. *Fungi Bioaerosols*, Boca Raton: CRC Press; 1995.
4. Husman T. Health effects of indoor-air microorganisms. *Scandinavian Journal of Work, Environment & Health*. 1996;22(1):5-13.
5. Douwes J, Thorne P, Pearce N, Heederik D. Bioaerosol health effects and exposure assessment: progress and prospects. *The Annals of Occupational Hygiene*. 2003;47(3):187-200.
6. Hayes RB, Van Nieuwenhuize JP, Raatgever JW, Ten Kate FJW. Aflatoxin exposures in the industrial setting: an epidemiological study of mortality. *Food and Chemical Toxicology*. 1984;22(1):39-43.
7. Siegler L, Kennedy MJ. Aspergillus, Fusarium, and other opportunistic moniliaceous fungi. In: Murray PR, Baron EJ, Pfaller MA, Tenover FC, Tenover FC, editors. *Manual of clinical microbiology*. 7th ed. Washington DC: American Society for Microbiology Press; 1999.
8. Overberger PA, Wadowsky RM, Schaper MM. Evaluation of airborne particulates and fungi during hospital renovation. *American Industrial Hygiene Association Journal*. 1995;56(7):706-12.
9. Overberger PA, Wadowsky RM, Schaper MM. Evaluation of airborne particulates and fungi during hospital renovation. *American Industrial Hygiene Association Journal*. 1995;56:706-12.
10. Stamm WE, Feeley JC, Facklam RR. Wound infections due to group A Streptococcus traced to a vaginal carrier. *Journal of Infectious Diseases*. 1978;138(3):287-92.
11. Berkelman RL, Martin D, Graham DR, Mowry J, Freisem R, Weber JA, et al. Streptococcal wound infections caused by a vaginal carrier. *Journal of the American Medical Association*. 1982;247(19):2680-82.
12. Berkelman RL, Martin D, Graham DR. Streptococcal wound infection caused by a vaginal carrier. *The Journal of the American Medical Association*. 1982;247:2680-82.
13. Centers for Disease Control and Prevention. Screening for Tuberculosis and Tuberculosis infection in high-risk populations: Recommendations of the advisory council for elimination of Tuberculosis. Georgia: Centers for Disease Control and Prevention; 1995. Report No.: RR-11:18-34.
14. Maeir RM, Pepper IL, Charles Gerba CP. *Environmental Microbiology*. Canada: Academic Press; 2002.
15. Banerjee D. Study of precipitation chemistry over an industrial city. *International Journal of Environment Science and Technology*. 2008;5(3):331-38.
16. Ammann HM. Why ACGIH Bioaerosol Committee does not recommend TLVs for bioaerosols. *Third International Conference on Bioaerosols, Fungi and Mycotoxins: Health Effects, Assessment, Prevention and Control*; 1998 September 23-25; Saratoga. New York: Springs; 1998.
17. Karen H. Bartlett, Ph.D. Assistant Professor School of Occupational and Environmental Hygiene University of British Columbia and et al. *Evaluating Indoor Air Quality: Test Standards for Bioaerosols*.
18. Yassin MF, Almouqatea S. Assessment of airborne bacteria and fungi in an indoor and outdoor environment. *International Journal of Environment Science and Technology*. 2010;7(3):535-44.
19. Kim KY, Kim YS, Kim D. Distribution characteristics of airborne bacteria and fungi in the general hospitals of Korea. *Ind Health*. 2010;48(2):236-43.

Evaluation of Bioaerosol in a Hospital in Tehran

Negar Darvishzadeh, *Farideh Golbabaee, Mohammad Reza Pourmand, Farideh Zeini, Abbas Rahimi Foroushani

Department of Occupational Health, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

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Abstract

Background and Objectives: Microorganisms are the agents that can cause disruption in the biochemical and physiological reactions through mechanisms such as infection, allergy or toxic properties in the case of entering human body and if the body's immune system be unable to destroy and eliminate biological agents, illness and even death will occur. This study evaluates air pollution(aerosol and bioaerosol) in different parts of a hospital in Tehran.

Materials and Methods: We assessed and evaluated bioaerosols by applying 0800 NIOSH method using Bacterial sampler and specific cultures for bacteria and fungi separately in ICU (intensive care unit), Pathology laboratory, Operating room, Recovery, and CSR (Central Service Room) of a hospital.

Results: The assessment showed that the average density of bacteria in the hospital studied was in the range of 1226.88 - 294.47 CFU/m³; the highest density was observed in the CSR and the lowest density measured was in the operating room. The bacteria identified included gram-positive bacillus (50.6%), Staphylococcus epidermis (20.29%), Staphylococcus Saprophyticus (2.6%), Staphylococcus aureus (7.03%), other Staphylococcus (5.9%) and Micrococcus (13.43%). Moreover, it was found that the average density of fungi was in the range of 0-188.45 CFU/m³; the maximum density in ICU and the minimum density in operating room and recovery room. The fungi identified included Aspergillus flavus (31.65%), Aspergillus fomicatus (25.17%), Aspergillus niger (15.82%), and penicillium (27.33%) .

Conclusion: Comparison of bacteria density in different parts of the hospital with the recommended limits of ACGIH (500 CFU/m³) showed that density exceeded the limits in all units except in operating room whereas, density of fungi was less than the recommended limits of ACGIH (100CFU/m³) in all units of hospital.

Keywords: Bioaerosol density, Hospital, Fungi

*Corresponding Author: fgolbabaee@sina.tums.ac.ir

Tel: +98 21 88951390 Fax: +98 21 88954781595