AN INVESTIGATION OF NUMBERS OF BACTERIAL AND FUNGAL AEROSOLS IN INDOOR-AIR ENVIRONMENT IN ROYAL THAI ARMY ORDNANCE DEPARTMENT

Manasawee Thongsringklee, Athasit Praditpornkul, Samat Preeklang, Duangporn Phulsuksombati, Chaiyaphruk Pilakasiri and Prangchai Settachan

Armed Forces Research Institute of Medical Sciences, Bangkok, Thailand

Abstract

Background: Royal Thai Army Ordnance Department was has been established more than 100 years ago. Most of the offices are old and lack of maintenance. Moreover, some offices were modified from the ware houses so the ventilation is not good. These reasons have caused the accumulation of bioaerosols; microorganism in the air, which can create health problems of workers. Therefore, we investigated numbers of bacterial and fungal aerosols in indoor-air offices of the Ordnance Department for 3 months.

Method: 196 air samples from 86 offices were collected by using Portable Biostage® Single stage bioaerosols impactor onto plates. Then plates of bacteria and fungi were incubated for 2 days. After that, colonies were counted and calculated. Other environmental factors, including CO, CO_2 , temperature, and relative humidity which can promote the growth of bioaerosols were measured by using Testo 435 IAQ multi-function instrument at the same time.

Results: The results showed that there were bacteria more than fungi in the offices. Both of the averages of total bacteria and total fungi in the air were acceptable; lower than 1,000 CFU/m^3 according to indoor building air quantity standard of Singapore Environment Ministry. Then we compared between indoor and outdoor values, and found that the ratio of indoor/outdoor was more than 30-60%, which was over the standard of OSHA. However, other environment factors were not over the standard. They did not relate to the number of bacteria and fungi in the air.

Conclusions: From the results, we summarized that the accumulation of bacteria and fungi in the air-conditioned offices may be causes of the health problems of the workers, such as allergic rhinitis and respiratory tract infection. Furthermore, the result that did not relate between numbers of bacterial and fungal aerosols to other environmental factors may due to the short duration of the investigation.

2nd International Committee of Military Medicine, Bangkok, Thailand, 27-30 Nov.2013, Poster Presentation