

## Characteristics of biological particles in indoor environment

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### Introduction

Currently, characterization of biological particles has become an important issue because of related health effects (Chih-Shan Li & Po-An Hou, 2003). Since many people spend most of their time indoors, in locations, homes, offices and other occupational environments, concern regarding the health effects of indoor air quality has growth. Therefore the aim of this study was to characterize the concentration and size distribution of the indoor biological particles (bacterial and fungal particles) using Andersen impactor as bioaerosol sampler at two heights and two different ventilation conditions.

### Materials and methods

Six stage Andersen impactor (operates at 28 l/min) was used for collecting biological particles. 27 ml of NA and PDA plates are used for bacterial and fungal collection, respectively. Sampling time was 15 minutes to avoid overestimated number of particles. The samples were incubated at 37 °C for 2-5 days. Measurements were performed at research laboratories of Physics department, Faculty of Science, Minia university at different heights; first and second floor. Runs were taken under two different ventilation conditions; minimum ventilation where all windows and doors kept closed and the second ventilation using air-conditioning system (ACV).

### Results

Concentration and size distribution of bacterial and fungal particles were measured at two heights and two different ventilation conditions. It was found that the mean concentration of total bacterial particles is higher than the total fungal particles in all the studied conditions, which might be related to the human sources. This is in agreement with the results of Jozef S. Pastuszka et al., (2000) and Chih-Shan Li & Po-An Hou (2003). As an example of the determining size distributions in this study, figure (1) and figure (2) illustrate the size distribution of fungal particles under different ventilations at the second floor. The highest concentration was found at size range 3.3 to 4.7  $\mu\text{m}$  at minimum ventilation while it shifts to the lower size range 2.1 to 3.3  $\mu\text{m}$  under ACV condition. These could be attributed to the reduction of residence time

of these indoor particles with ventilation factor (Hussein Kanaani et al., 2008).

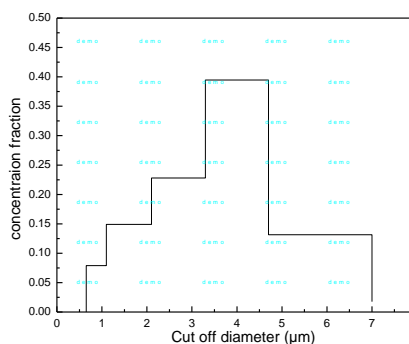


Figure (1). size distribution of fungal particles at minimum ventilation

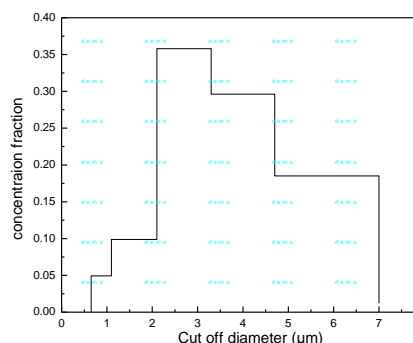


Figure (2). size distribution of fungal particles at ACV

### References

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