

Study on Characteristics of Aerosol Bacteria at The Self-Studying Areas (outdoor) in The University of Sciences

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Abstract

The outdoor air quality in educational facilities is increasingly receiving attention due to its direct impact on the health and learning process of students. To have an overview, the study aimed to quantify the bacterial concentration and identify the bacterial composition at the self-studying areas (outdoor air) at the University of Natural Sciences in Ho Chi Minh City. Samplings were applied with both active and passive methods, with a 15-minute sampling time using a Biostage device for active sampling and Koch's sedimentation method for passive sampling. The diversity assessment of bacteria in the aerosol was analyzed using the 16S Metabarcoding method. The research results showed that bacterial colonies were counted 24-48 h of incubation at $37\pm 1^\circ\text{C}$ got a positive correlation with temperature. Meanwhile, humidity showed an inverse correlation with bacterial density. The average bacterial density in the self-studying area on the 12th floor of Building I (268.55 CFU/m^3) was lower than that in the ground floor of Building C (341.43 CFU/m^3) because students were crowded in Block C. The active method showed the average bacterial density in Building C ($372.79 \pm 141.25 \text{ CFU/m}^3$) was higher than that on the 12th floor of Building I ($208.92 \pm 108.03 \text{ CFU/m}^3$). At the same time, with the passive method, it was $63.73 \pm 13.02 \text{ CFU/m}^3$ in Building C was also higher than $30.62 \pm 4.46 \text{ CFU/m}^3$ bacteria concentration in the 12th floor of Building I. Finally, the results of the 16S Metabarcoding identification analysis have got over 80 bacterial species in the self-studying areas, with prominent genera including *Acinetobacter* and *Bacillus*. Some characteristic species were also detected, such as *Acinetobacter spp.* and *Bacillus sp.*. These findings of this study are completely consistent with other studies in the Asian area.

Early Career Scientist

YES, I am an early career scientist.

IGAC Activities

ACAM: Atmospheric Chemistry and the Asian Monsoon, MAP-AQ: Monitoring, Analysis and Prediction of Air Quality

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MANGO: Monsoon Asia and Oceania Networking Group