Supplementary Material for the Article:

Dissimilar emission characteristics between bioaerosol and suspended particles from gaseous biofilters and bioaerosol health risk evaluation

Yingcai Wang[1, 2], Yan Fu[1, 2], Can Wang[1,2*], Nuanjia Wen[1,2]

[1] *School of Environmental Science and Engineering, Tianjin University, Tianjin 300350, China*
[2] *Key Lab of Indoor Air Environmental Quality Control, Tianjin University, Tianjin 300350, China*

[*] Corresponding author: **Can Wang**

Tel: +86-22-85356231; Fax: +86-22-85356231

E-mail address: wangcan@tju.edu.cn

Journal: **Aerosol and Air Quality Research**

Text: **S1**

Figure: **S1—S4**

List of Supplementary Material:

Text S1. Methods of impacting factors control

The experiment was conducted under constant temperature (25 ± 2℃) and relative humidity (50 ± 5%) in laboratory to minimize the effects of the external environment on this study. The laboratory was ventilated after each experiment to eliminate the remained bioaerosol and organic gas in room. 0.15 mL h^{-1} toluene was injected with air flow rate of 0.2 m^3 h^{-1} when the experiment was out of running to maintain the activity of microbes. Time span between two separate experiment varied among the studied operating conditions. Generally, the time span for microbe recovery to an ordinary condition was more than 24h, during which microbe biomass was monitored as an indicated parameter for time span design.

- Gas velocity control

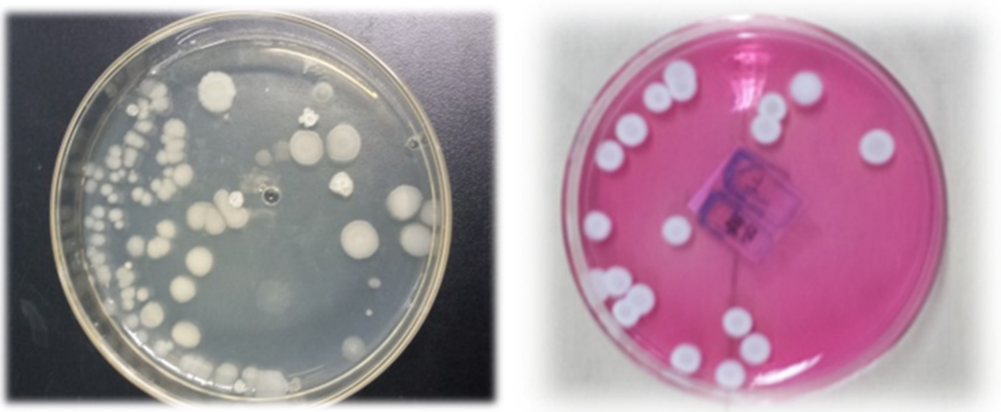
  The gas velocity was controlled by a gas distribution system, including air compressor (Haili, ACO-318, 45 W, 70 L min^{-1}), microinjector (ALC-IP 900) and glass rotameter (LZB-10). Toluene was injected into gas circuit by the microinjector and mixed with air flow. The gas velocities were calculated to be accordance to the air flow rate, which could be controlled by the glass rotameter.

- Gas temperature control

  The biofilters were covered by a crawler-type ceramic heater (LCD16-55) which was used for heating packing bed. The temperature sensor (Meacon, WZP-PT1000) was equipped above the packing bed to monitor outlet gas temperatures. 1 min was maintained to eliminate the fluctuation of gas flow before sampling when gas temperature reached to the setting value.

- Moisture content control

  The moisture content was controlled by a spraying system, including the metering pump (IWAKI ESBN4), moisture meter (Shunda, TR-6) and micro-computer time controller (Zhuoyi, ZYT16G). Nutrient medium was sprayed to increase the moisture content of packing bed. After spraying, the moisture content increased to nearly 100%. Then, the moisture content was monitored every 20 min. The bioaerosol samples were collected until moisture content decreased to target value from ~100%.



(a) bacteria (b) fungi

Fig. S1. The physical appearance and morphological characteristics of bioaerosol.

Fig. S1

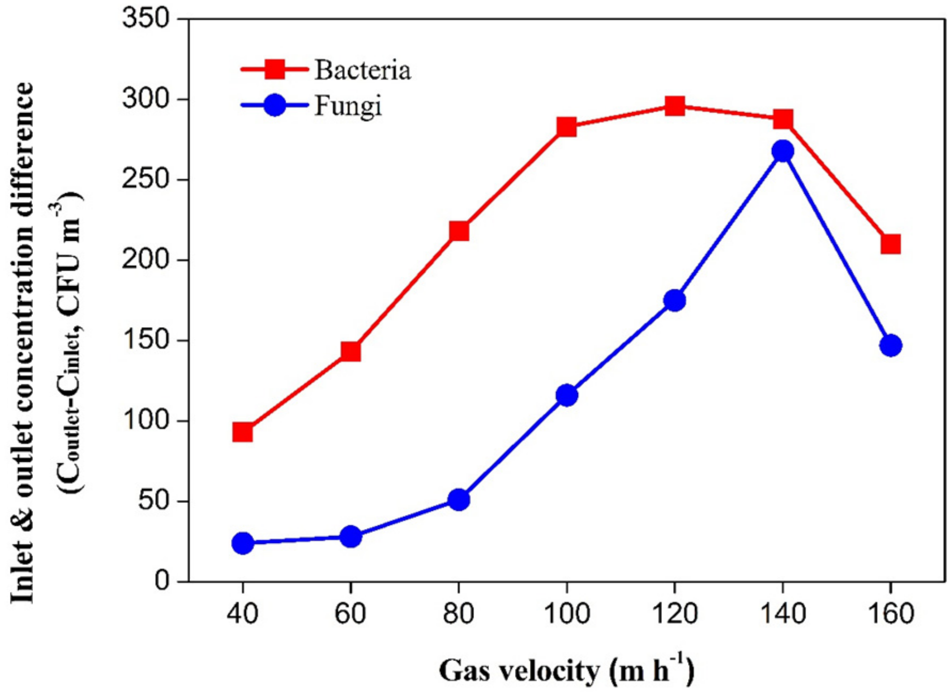


Fig.S2. Bioaerosol emission concentration difference between inlet and outlet under different gas velocities.

Fig. S2

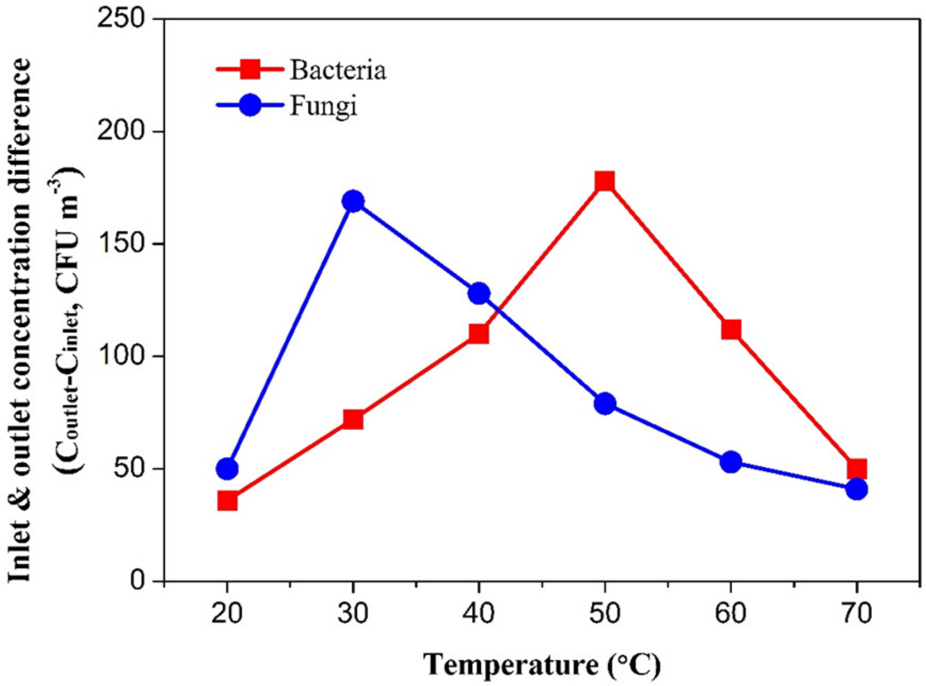


Fig.S3. Bioaerosol emission concentration difference between inlet and outlet under different temperatures.

Fig. S3

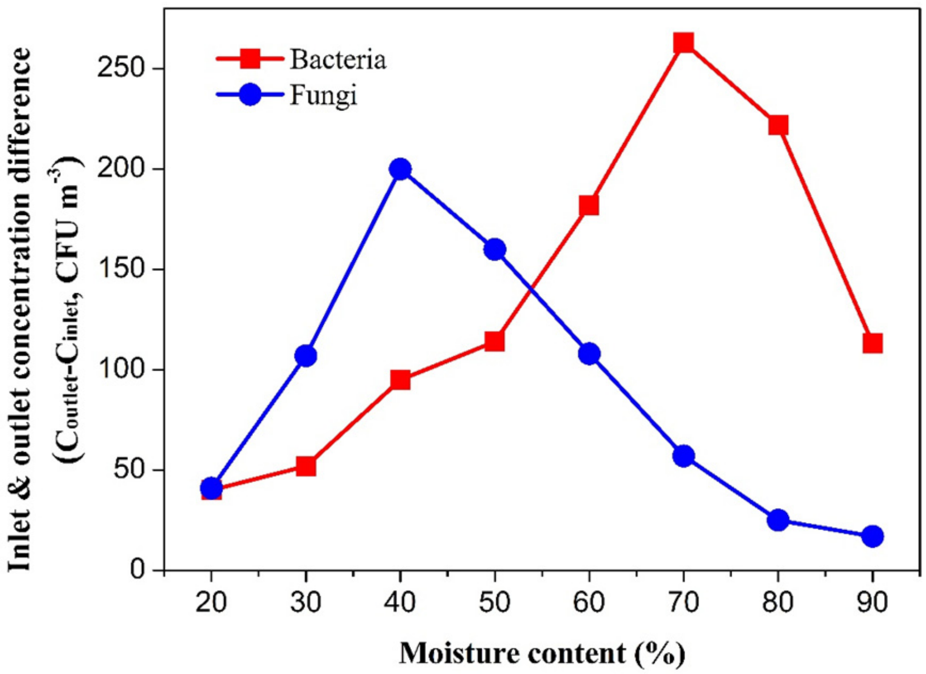


Fig.S4. Bioaerosol emission concentration difference between inlet and outlet under different moisture contents.

Fig. S4