World Academy of Science, Engineering and Technology
International Journal of Chemical and Molecular Engineering
Vol:12, No:04, 2018

Evaluation of Negative Air Ions in Bioaerosol Removal: Indoor Concentration of Airborne Bacterial and Fungal in Residential Building in Qom City, Iran

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Abstract : The present investigation was conducted to detect the type and concentrations of bacterial and fungal bioaerosols in one room (bedroom) of each selected residential building located in different regions of Qom during February 2015 (n=9) to July 2016 (n=11). Moreover, we evaluated the efficiency of negative air ions (NAIs) in bioaerosol reduction in indoor air in residential buildings. In the first step, the mean concentrations of bacterial and fungal in nine sampling sites evaluated in winter were 744 and 579 colony forming units (CFU)/m³, while these values were 1628.6 and 231 CFU/m³ in the 11 sampling sites evaluated in summer, respectively. The most predominant genera between bacterial and fungal in all sampling sites were detected as Micrococcus spp. and Staphylococcus spp. and also, Aspergillus spp. and Penicillium spp., respectively. The 95% and 45% of sampling sites have bacterial and fungal concentrations over the recommended levels, respectively. In the removal step, we achieved a reduction with a range of 38% to 93% for bacterial genera and 25% to 100% for fungal genera by using NAIs. The results suggested that NAI is a highly effective, simple and efficient technique in reducing the bacterial and fungal concentration in the indoor air of residential buildings.

Keywords : bacterial, fungal, negative air ions (NAIs), indoor air, Iran
Conference Title : ICAST 2018 : International Conference on Aerosol Science and Technology
Conference Location : Lisbon, Portugal
Conference Dates : April 16-17, 2018

Open Science Index, Chemical and Molecular Engineering Vol:12, No:04, 2018 publications.waset.org/abstracts/76068.pdf