

Assessment of Bioaerosol and Microbial Volatile Organic Compounds in Different Sections of Library

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Abstract : A pilot study of indoor air quality in terms of bioaerosol (fungus and bacteria) and few selective microbial volatile organic compounds (MVOCs) was carried out in different indoor sections of a library for two seasons, namely monsoon and post monsoon. Bioaerosol sampling was carried out using Anderson six stage viable sampler at a flow rate of 28.3 L/min while MVOCs were collected on activated charcoal tubes ORBOTM 90 Carboxen 564. Collected MVOCs were desorbed using carbon disulphide (CS₂) and analysed by GC-FID. Microscopic identification for fungus was only carried out. Surface dust was collected by sterilised buds and cultured to identify fungal contaminants. Unlike bacterial size distribution, fungal bioaerosol concentration was found to be highest in the fourth stage in different sections of the library. In post monsoon season both fungal bioaerosol (710 to 3292cfu/m³) and bacterial bioaerosol (298 to 1475cfu/m³) were found at much greater concentration than in monsoon. In monsoon season unlike post monsoon, I/O ratio for both the bioaerosol fractions was more than one. Rain washout could be the reason of lower outdoor concentration in monsoon season. On the contrary most of the MVOCs namely 1-hexene, 1-pentanol and 1-octen-3-ol were found in the monsoon season instead of post monsoon season with the highest being 1-hexene with 7.09µg/m³ concentration. Among the six identified fungal bioaerosol *Aspergillus*, *Cladosporium* and *Penicillium* were found in maximum concentration while *Aspergillus niger*, *Curvuleria lunata*, *Cladosporium cladosporioides* and *Penicillium sp.*, was identified in surface dust samples. According to regression analysis apart from environmental factors other factors also played an important role. Thus apart from outdoor infiltration and human sources, accumulated surface dust mostly on organic materials like books, wooden furniture and racks can be attributed to being one of the major sources of both fungal bioaerosols as well as MVOCs found in the library.

Keywords : bacteria, Fungi, indoor air, MVOCs

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