

Exploration of Biological Aerosols at Agra over Indo-Gangetic Basin

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Aerosols is a mixture of tiny particles are a subset of air pollution that suspended everywhere in our atmosphere. The particulate emitted from different sources and suspended in the air constitutes biotic (biological) and abiotic (non biological) components both.

In present study we measured the atmospheric concentration of PM (Particulate Matter) and biological components (Fungi, Gram+ve and Gram-ve bacteria) of Particulate matter (PM_{2.5}) in ambient air in monsoon season over Agra, Indo Gangetic plain in India along with meteorological parameters. Air samples were drawn into Glass fibre filter paper of PM_{2.5} using Polltech sampler at a flow rate of 16 L min⁻¹ for 24 hrs.

The concentration of PM_{2.5} is much higher than WHO, USEPA, EUpAQ and NAAQ standards. Biological concentration increased with increase in the level of particulate matter and there have been differences in the types of species. A total fourteen types of fungi are obtained and identified. Highly observed fungal spores detected in the samples were *Aspergillus niger* & *Fusarium oxysporium*. Specific identification of bacteria was conducted by gram staining method followed by microbial analysis helped to identify the different shapes of bacteria collected. *Coccus* was found maximally than bacillus. Bacterial concentration is more significant than fungal concentration at both sites, +ve bacteria contribute more than gram-ve bacteria.

Table: The statistics of concentration of PM_{2.5} and their microbial constituents.

Parameter	Mean(SD)	Maximum	Minimum
PM _{2.5} (µg m ⁻³)	36.2(19.38)	66.66	16.66
Fungi(cf u m ⁻³)	126.8(50.5)	187.5	41.66
Bacteria(cf u m ⁻³)	964.1(481.1)	1625	250
Protein (ng m ⁻³)	0.52(0.01)	0.33	0.16

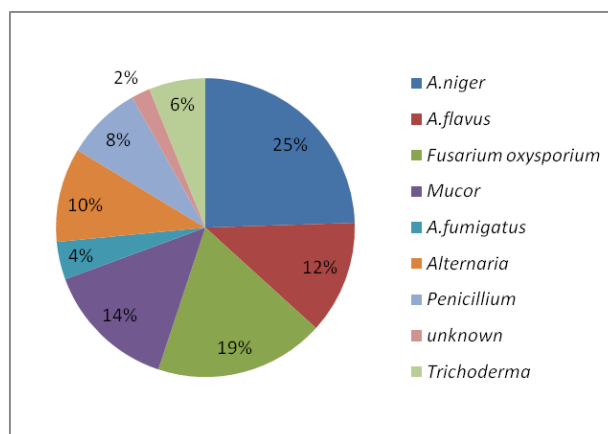


Figure 1: Percentage distribution of different isolated fungi obtained from aerosols.

Bacteria were more dominant compare to fungi, may be due to the pathogenic bacteria more active in monsoon season. Gram +ve bacteria found higher than Gram-ve bacteria. Gram+ve cocci shaped bacteria were more dominant over Gram -ve bacillus shaped bacteria. Good correlation among temperature and bacteria also indicate that growth of bacteria is influenced by temperature.

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