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Ambient Air Pollution Monitoring In Urban Area of Indore City with Special Reference to Total Suspended Particulate Matter

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ABSTRACT: The Paper reports the Ambient Pollution level at different location of Indore city. The relationship between human disease and exposure to pollution is neither simple nor adequately understood Respirable dust (TSPM of less than 10 micron size) is an important air pollutant of concern on account of its ability to reach alveoli of human lungs during respiration. There is little information available regarding the concentration and pattern of diurnal change of this important parameter in the ambient air in urban environment. Organic, Inorganic and biological materials comprise particulates air pollutants and cause toxic effects. The present study deals with the particulates matter collected from different polluted location and its effects. Data for total TSPM and equated 24 hours average TSPM (Total suspended particulate matter) is also presented and discussed.

INTRODUCTION

Total Suspended particulate matter is major air pollutant in India. The level of TSPM in ambient air have been found to be remain about the permissible level, the composition of TSPM include organic and inorganic matter. The suspended particulate matter is present in troposphere and lower stratosphere, where they stay for long period. These pollutants are observing in water, soil, Vegetation, Respiration organs etc. Causing several health hazard and injurious on the living biota.

SPM are commonly associated with gaseous pollutants of Industrial and Urban areas. In India, The amount of particulates in ambient air is very high as compared to temperature countries. Indore is an important city and the commercial capital of Madhya Pradesh with a population of over 3,276,697 lakh and Density 839 per Sq. Km. (Reported in the year 2011).

Indore enjoys a high ratio of number of vehicles to population (1: 4) which has resulted in to increased air pollution problem in recent years. The present communication deals with ambient TSPM levels at different locations in Indore city. The study deals with the preliminary investigation on concentration of respirable dust at the road side of the core city area of Indore, during peak traffics hours.

MATERIALS METHODS

Air sampling equipment High volume sample is the equipment which is used to monitor the SPM. The SPM concentration was collected on glass fiber filter cable by drawing air at rate of 1.1 to 1.4 m^3 / min by high volume sampler. The filter used in a high volume sampler usually consists of glass fibers and have a collection efficiency of more than 99%. For particles with 0.8 µ diameter with diameters exceeding 100µ remain on the filter surface. Samples collected by filters are analyzed.

The samples of ambient air were drawn during peak traffic hours on located side from the respirable zone. Height of 1.2 to 1.5 meter above ground. SPM was estimated gravimetrically high volume sampler. TSPM were calculated on the basis of 24 hourly average values of SPM obtained by the high volume sampler for the comparison sake.

RESULT AND DISCUSSION

From the above study it was observe that the data collected from various locations of Indore city and shows that there is numerous change in the concentration of Total Suspended Particulate Matter at various sites and found that during peak traffic hours the concentration is in higher side.

It was also observed that, the concentration of TSPM changes according to humidity, if humidity increases then TSPM decreases and if humidity decreases then TSPM increase In our study during peak traffic hours. The concentration of TSPM is higher in Vijay Nagar, Bhawar Kuan, Mhow Naka, White Church Circle, Rajwada, Regal Square, and Palasia Square. Out of which the highest concentration was observed in White Church Circle and it was also found that due to higher concentration of SPM in atmosphere it will affect plants and human beings, at peak traffic hours the of TSPM is more and due to inhalation of such pollutant from Atmosphere people suffer from many diseases like Asthma, Bronchitis. Itching, allergy etc. and the plants which are present near road side they will suffer badly there growth affected due to deposition of SPM on plants leaves the chlorophyll contain get reduces and the soil also gets contaminated. Hence from the above it is clear that if the concentration of TSPM is more than pollution will be more.

Table1: TSPM Concentration at different location at Indore (in µg/m^3).

S.No	Location of the Sampling Stations	Total Suspended Particulate Matter		S. No	Location of the Sampling Stations	Total Suspended Particulate Matter	
		Equated 24 Hourly mean				Equated 24 Hourly mean	
		M	E			M	E
1	Rajiv Gandhi circle	540	682	**10**	Mhow Naka square	642	765
2	Bhawarkuan square	652	780	**11**	Rajmohlla square	592	725
3	Navlakha square	582	705	**12**	Bombay Bajar	610	710
4	G.P.O. circle	553	685	**13**	Siyaganj square	613	747
5	White Church circle	688	885	**14**	Kothari market	598	712
6	Palasia square	665	847	**15**	Sardar patel square	570	680
7	Vijay nagar square	658	775	**16**	Nehru Statue	602	735
8	Dewas naka circle	605	690	**17**	Rajwada area	635	820
9	Collectorate circle	588	670	**18**	Regal square	624	827

M = Morning and E = Evening

CONCLUSION

In our study we will find that the data collected from various sites of Indore shows that the concentration of Total Suspended Particulate Matter level is high during peak traffic hours.

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