Though they did not consider microbes in formulating their general conclusion, the oscillation of UV sensitivity of obligate photoautotrophic cyanobacteria in their natural habitats may be the most striking example of survival strategy among microbes, substantiating the proposal.

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ACKNOWLEDGEMENTS. We thank Jyoti Ramchandani for help and to Pawan Dalmia for software support. This work was supported by grants from the Council of Scientific and Industrial Research, New Delhi. This work was carried out in Bhabha Atomic Research Centre, Mumbai, India.

Received 26 March 2007; revised accepted 19 February 2008

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Assessment of air pollution in Aizawl city

A study of air pollution was carried out in Aizawl city during 2006–07. The study sites selected and their station types are given in Table 1.

The objectives of study were to estimate suspended particulate matter (SPM), respirable suspended particulate matter (RSPM), nitrogen dioxide (NO_2) and sulphur dioxide (SO_2).

The ambient air quality at four different stations was monitored from 28 September to 24 November 2006, and from 2 March to 29 June 2007. Analysis was done once every week and the sample monitored for 8 h. The absorbing reagents and filter paper were kept a day before analysis. After monitoring for 8 h, the sample was then taken back to the laboratory for analysis.

SPM in the atmosphere was determined using high volume method. RSPM in the ambient air was determined using the cyclonic flow technique. A respirable dust sampler was used for the estimation of RSPM and SPM.

NO_2 in the atmosphere was determined using Jacob and Hochheiser modified (sodium arsenite) method[1]. SO_2 in the air was determined using the modified West and Gaeke method[2].

The present study shows that the concentration of SPM, RSPM, NO_2 and SO_2 varies greatly from one station to another. The study was done based on the National Ambient Air Quality Standards given by the Central Pollution Control Board[3]. The average concentration of the estimated particulate matter and gases is given in Table 2.

The average concentration of SPM in Bawngkawn was the highest at 131.85 $\mu g/m^3$ and was lowest at the MZU Campus (38 $\mu g/m^3$). Khatla with an average of 83.95 $\mu g/m^3$ is in the medium range as well as Laipuitlang (63.56 $\mu g/m^3$). Also, from the data obtained, SPM analysed in 2007 was comparatively higher compared to 2006, which could be due to the slash and burn method of agriculture practised widely in the Northeast and commonly in Mizoram. Various activities like power generation, demolition, spraying, grinding, agriculture and stone quarrying generate SPM. Automobile exhaust has been found to contain 40–50 $\mu g/l$ SPM; thus some areas with high vehicle density like Bawngkawn have the highest SPM.

RSPM is injurious to health. Particulate in the size range up to 10 mm can be considered as RSPM. The RSPM concentration at all the stations was more or less similar, ranging from 38.06 $\mu g/m^3$

Table 1. Study sites and their station type

Site	I	II	III	IV
Sampling location	Khatla, Aizawl	Laipuitlang, Aizawl	Bawngkawn, Aizawl	MZU Campus, Tanhril
Station type	Residential and commercial area	Residential area	Residential and commercial area	Institutional area

Table 2. Average ambient air quality in Aizawl city

Sampling location	Station type	Average concentration ($\mu g/m^3$)			
		SPM	RSPM	NO_2	SO_2
Khatla	Residential and commercial area	82.95	52.89	11.54	0.94
Laipuitlang	Residential area	63.56	38.06	7.08	0.82
Bawngkawn	Residential and commercial area	131.85	58.06	12.89	1.57
MZU Campus	Institutional area	45.78	47.61	3.04	0.78

(lowest) at Laipuitlang to 58.06 $\mu g/m^3$ at Bawngkawn (highest). Khatla had an average concentration of 52.89 $\mu g/m^3$, and the value was 47.61 $\mu g/m^3$ at MZU campus.

The study shows that the average NO_2 concentration was highest in Bawngkawn (12.89 $\mu g/m^3$), followed by Khatla (11.54 $\mu g/m^3$), Laipuitlang (7.08 $\mu g/m^3$) and MZU Campus (3.04 $\mu g/m^3$).

The average SO_2 concentration in Aizawl city was below the detection level, i.e. 4 $\mu g/m^3$. Bawngkawn had the highest value (1.57 $\mu g/m^3$) followed by Khatla (0.94 $\mu g/m^3$), Laipuitlang (0.82 $\mu g/m^3$) and MZU campus (0.78 $\mu g/m^3$). The reason for the lowest level at the MZU campus is because it is an institutional area with less traffic, low population and less social activities.

From the data, it can be concluded that the residential and commercial areas have a higher SPM, RSPM, NO_2 and SO_2 compared to the only residential and institutional areas. According to the air quality standards given by NAAQS and WHO, the pollutants values obtained are all within the standard level. As far as air pollution is concerned, it is rather fortunate that big-sector industries have not been set up in Mizoram, though the enormous increase in the number of vehicles with the associated problems of traffic congestion is a major contributor among the various sources of air pollution. People must participate in the environmental quality improvement programmes. Also, Aizawl city is not well-planned and also lack spaces and greenery. So there is a possibility that the green leaves that trap CO_2 emitted by the vehicles are not adequately trapped and thus pollution gradually increases. A more scientific outlook is needed to mitigate air pollution before the situation becomes uncontrollable, as has happened in other cities.

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ACKNOWLEDGEMENT. We thank Mr C. Lalduhawma and staff of the Mizoram Pollution Control Board for providing laboratory facilities for the study.

Received 17 September 2007; revised accepted 21 February 2008

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