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Characterization of Mosquito Coil and Incense Aerosols

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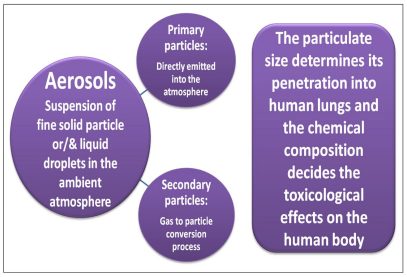
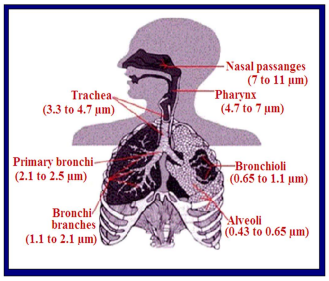
1. Introduction





PM_{10}: *Da*< 10 µm (Thoracic particles); $PM_{2.5–10}$: 2.5 µm <*Da*< 10 µm (Coarse particles)
$PM_{2.5}$: *Da*< 2.5 µm (Fine particles); PM_1: *Da*< 1.0 µm (Submicron particles).

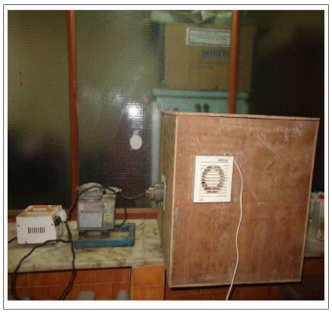
2. Objectives

- The main goal of this study is to present a comprehensive set of measurement of size distributed aerosol sample collected from incense and mosquito coils burning.
- To study the fluxes of the PM_{10} and $PM_{2.5}$ particulates incense and mosquito coils burning .
- PM concentration of $PM_{2.5}$ distributed into PM_{10}.

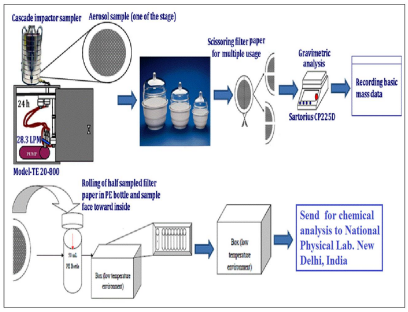
3. Malfunction

4. Experimental

4.1 Sample collection

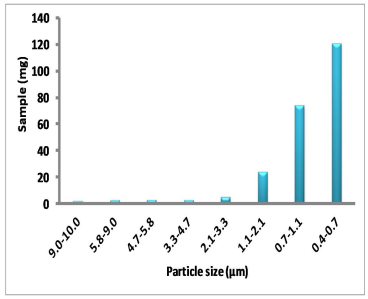


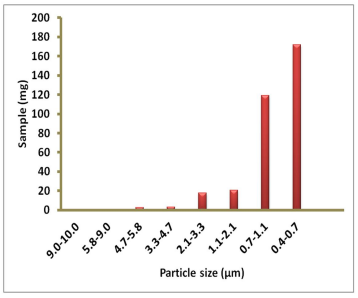
4.2 PM Sampling, Gravimetric and Chemical Analysis



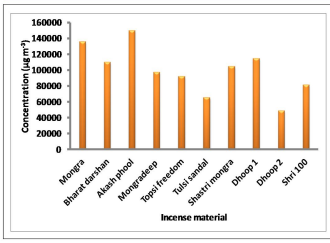
5. Result and discussions

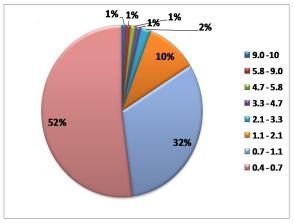
5.1 Fluxes of Size segregated aerosols from incense and mosquito coil burning



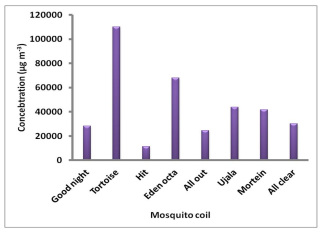


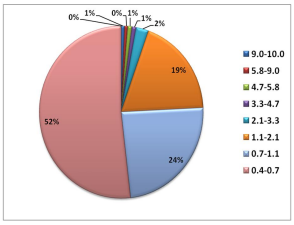
5.2 Size-segregated PM from Incense Sticks





5.3 Size-segregated PM from Mosquito Coils





5.4 Size distribution of aerosol particles from incense burning (µg m^{-3})

Code no.	Particle size, µm	Smoking time, min	Flow rate, l min^{-1}	Air passed	Distribution in indoor air µg m^{-3}
1	9.0-10	75	20	1.5	133
2	5.8-9.0	75	20	1.5	333
3	4.7-5.8	75	20	1.5	933
4	3.3-4.7	75	20	1.5	1200
5	2.1-3.3	75	20	1.5	6400
6	1.1-2.1	75	20	1.5	43600
7	0.7-1.1	75	20	1.5	67667
8	0.4-0.7	75	20	1.5	82667

5.5 Size distribution of aerosol particles from mosquito coil burning (µg m^{-3})

Code no.	Particle size, µm	Smoking time, min	Flow rate, lmin^{-1}	Air passed	Distribution in indoor air µg m^{-3}
RR1	9.0-10.0	80	20	1.6	1875
RR2	5.8-9.0	80	20	1.6	1625
RR3	4.7-5.8	80	20	1.6	2250
RR4	3.3-4.7	80	20	1.6	2312
RR5	2.1-3.3	80	20	1.6	6750
RR6	1.1-2.1	80	20	1.6	51250
RR7	0.7-1.1	80	20	1.6	65312
RR8	0.4-0.7	80	20	1.6	141375

6. Conclusion

The fine particulates are dominated during fuming of the both materials. The higher concentration of fuming materials was found in the mosquito coils as compared to incense sticks. The concentration of aerosols substantially increases as the particle diameter decreased during burning process.

7. References

[1] S. C. Chen, R. H. Wong, L. J. Shiu, M. C. Chiou, H. Lee, Exposure to mosquito coil smoke may be a risk factor for lung cancer in Taiwan, *Journal of Epidemiology*, 2008, 18 (1), 19–25.
[2] T. C. Lin, G. Krishnaswamy, D.S. Chi, Incense smoke: clinical, structural and molecular effects on airway disease, *Clinical and Molecular Allergy*, 2008, 6, 1–9.
[3] B. Wang, S.C. Lee, K.F. Ho, Y.M. Kang, Characteristics of emissions of air pollutants from burning of incense in temples, Hong Kong, *Science of the Total Environment*, 2007, 377, 52-60.