PAHs and associated carcinogenic potencies in PM_{10} at residential site of a semi arid region of India

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Objective & Methodology

Particulate matter from an urban residential site within Agra city (a semi-arid region) were collected using respirable dust samplers in order to study the concentration and exposure profiles of polycyclic aromatic hydrocarbons (PAHs).

The samples were extracted with dichloromethane using an automated Soxhlet Extraction. The extracts were analyzed on gas chromatography coupled with mass spectrophotometer (GC-MS)[1,2,3].

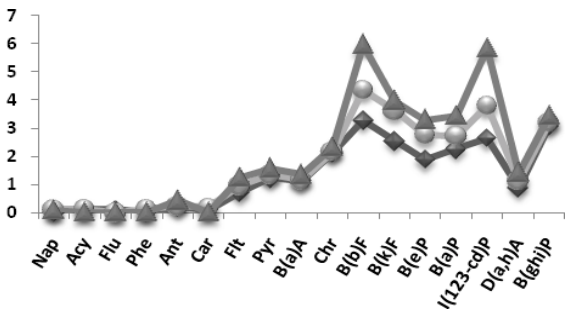

Figure 1: Seasonal trend of PAHs at urban site of Agra

Discussion of Results

The total PAH (TPAH) concentrations were 27.96 ± 2.3, 22.24 ± 2.1, and 34.38 ± 3.0 ngm^{-3}, respectively, during summer, monsoon and winter seasons. The combined mean concentration of TPAH was 28.19 ngm^{-3} for all seasons. The chief PAHs found in the samples collected from this urban region were Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(b)fluoranthene and Indeno(1,2,3-cd)pyrene. Dibenz(a,h)anthracene contributed the highest carcinogenic exposure equivalent (4.09 ngm^{-3}) followed by Benzo(a)pyrene (2.80 ngm^{-3}), Benzo(b)fluoranthene (0.453 ngm^{-3}) and Benzo(k)fluoranthene (0.338 ngm^{-3}), accounting for approximately 50%, 35%, 6% and 4% of the total carcinogenicity of particulate PAH in this urban region.

[1] Masih and Taneja (2006) *Chemosphere* **65**, 449-456. [2] Masih et al. (2010) *EMA* **163**, 421–431. [3] Masih et al. (2010) *JHM* **177**, 190–198.