

## **Carcinogenic Particulate Bound Polycyclic Aromatic Hydrocarbons (PAHs) in the Atmosphere of Temples: Exposure and Health Risk Assessment**

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A large group of PAHs are emitted into the air when incense sticks are burnt in homes and temples in South East Asian countries. In the experimental set-up, the main highly carcinogenic and genotoxic benzo (a) pyrene (B(a)P) emission in incense sticks was approximately one to three folds higher than cigarettes ( $P < 0.01$ ). The cross - sectional laboratory based comparative study was conducted to assess the inhalation exposure and health risk of the people working in temples. The mean 10 PAHs in (45) temple workers was  $19.56 \pm 5.74 \text{ ng/m}^3$  and statistically different with non-exposed workers ( $2.09 \pm 0.65 \text{ ng/m}^3$ ) ( $P < 0.001$ ). B (a) P was ( $2.52 \pm 0.83 \text{ ng/m}^3$ ) in temple workers and 50 times higher than control group ( $0.04 \pm 0.01 \text{ ng/m}^3$ ) ( $P < 0.001$ ) and the B (a) P equivalents of the mean level of 10 PAHs were 3.51 and 0.14 respectively. The Mean urinary 1 hydroxy pyrene (1-HOP) level in the temple workers was  $0.10 \pm 0.03 \text{ } \mu\text{mol/mol Cr}$  and higher compared to the control group ( $0.06 \pm 0.01 \text{ } \mu\text{mol/mol Cr}$ ). The corresponding concentrations of B (a) P for temple (1), (2) and (3) were  $2.28 \text{ ng/m}^3$ ,  $1.61 \text{ ng/m}^3$  and  $6.65 \text{ ng/m}^3$  respectively. The excess life time cancer risk assessments (ELCR) were  $2.24 \times 10^{-4}$ ,  $1.59 \times 10^{-4}$  and  $6.56 \times 10^{-4}$  respectively. This study suggested that an exceedingly large amount of PAHs exposure in the temples can be a serious health concern.