Particle-bound PAH compounds on plant leaves

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Polycyclic aromatic hydrocarbon (PAH) compounds are known environmental pollutants. Some of them are carcinogen or mutagen. The leaves were collected from thirteen places around a science-park in Hsinchu city. Leaves samples were treated by ultrasonic extraction using acetonitrile solvent. The extracted solution was then analyzed for 16 PAH compounds by HPLC-fluorescence detection method.

Fifteen PAH compounds were detected in collected leave samples. These compounds are naphthalene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benz(a)anthracene, chrysene, benz(b) fluoranthene, benz(k)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene, indeno(1,2,3-cd) pyrene, respectively. Sampling places were grouped in three categories; nearby major road traffic, 5-10 meters away from major road traffic, and more than 10 meters from major road traffic. The total mass of these PAH compounds for these three categories was found to be 2.6, 1.0, and 0.7 ng/cm^2. From these results, road traffic appears to be the major source of these PAH compounds on plant leaves. In addition, the sampling places were also grouped by their orientations around the science-park; southwest, southeast, northeast, and northwest. The total mass of these PAH compounds for these four orientations was found to be 0.8, 2.0, 1.0, and 0.7 ng/cm^2 . It appears that wind direction and velocity is not a major factor affecting the total mass collected on plant leaves.