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Spatial and temporal variability of PAH concentration in Cork urban air.

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According to the World Health Organization, 4–8% of deaths occurring annually in the world are related to air pollution. The main pollution sources are associated with anthropogenic activities and the emission of gases and particulate matter. The particles are generally classified by their size rather than composition. Thus "coarse" particles have aerodynamic diameters larger than 2.5 μm and "fine" particles possess diameters lower than 2.5μm. Particulate matter can contain a wide range of chemical species ranging from elements ($e.g.$ carbon, trace metals, silicon) to inorganic ions (e.g. nitrate, sulphate) and organic compounds such as polycyclic aromatic hydrocarbons (PAHs). PAHs have started to be widely studied and a special concern is being paid to environmental subjects due to their carcinogenic and mutagenic properties.

In this framework, the purpose of this study is to assess the spatial and temporal variability of PAH concentration in Cork urban air by measurements obtained from two different sampling campaigns in 2001 and 2005. The samples were collected using two types of samplers, a high volume cascade impactor (HVCI) and a dichotomous Partisol sampler. Both samplers separate the collected PM_{10} into the coarse ($PM_{10-2.5}$) and fine ($PM_{2.5-0.1}$) fractions. Three locations were chosen for the sampling programme including the city centre, a "background urban" site and a "background rural" site. Soxhlet extraction followed by sequential elution through a silica gel solid phase extraction column and gas chromatography-mass spectrometry (GC-MS) has been used to analyse a range of organic compounds including Polycyclic Aromatic Hydrocarbons (PAHs).