The occurrence of OCPs, PCBs, and PAHs in the air of Naples, southern Italy

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As many of the modern world metropolis, the city of Naples, in southern Italy, faces with a series environmental problems due to the increasing emission in the atmoshere of persistent, bio-accumulative and toxic substances. Within the framework of a huge multi-purpose monitoring project (called "Campania Trasparente"), with the aim of depicting the spatial distribution and the variations of the atmospheric POPs concentrations on a seasonal basis, an air-monitoring network was developed through the installation of Polyurethane Foam-Based Passive Air Samplers (PUF-PAS) at approximately 150 sites across the whole Campania region.

The project was implemented in two stages: a first pilot study was focused on the metropolitan area of Naples and its surrounding areas, and a subsequent investigation was spreaded to the whole territory of the Campania region.

Here we present the results proceeding from the first research stage wich lasted 9 months covering three sampling campaigns, namely autumn (July to October 2015), winter (October 2015 to January 2016) and spring (January to April 2016).

The results showed that the site-specific sampling rate (Rs) in this study was 3.58 ± 1.18, 3.13 ± 1.38, 3.72 ± 1.66 m3/day in autumn, winter, and spring, respectively. For all seasons, the levels of $\sum$16PAH and $\sum$18PCBs in urban areas were significantly higher than those of rural areas ($p < 0.05$). The levels of $\sum$ 24OCPs in autumn and winter were particularly similar, but significant higher than in spring; $\sum$ 16PAH in winter and $\sum$18PCBs in autumn were significant higher than that of the corresponding two season ($p < 0.05$). Fugacity modeling was introduced to evaluate the soil-air exchange. The results showed that most of the PCB congeners are largely at air-soil equilibrium, with a trend towards the deposition to soil as the temperatures fall. The more volatile OCPs and PAHs, such as α-, and γ-HCH, HCB, Ace, Acy, and so on, undergo a net volatilization from soil, while other compounds are largely at equilibrium or tend to deposite to the ground.