

Seasonal and weekly modulations of Psychotropic Substances (PSs) in Rome, Italy

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In the frame of the LIFE+(Environment and Health) Programme, CNR participates to EXPAH project (coordinator: INAIL, Rome, Italy), aimed at assessing the true exposition of population to airborne toxicants.

Although the principal objective of the project were polynuclear aromatic hydrocarbons (PAHs), a set of ancillary toxicants were investigated, comprising licit and illicit drugs, to elucidate the true role played by compound classes (Cecinato et al 2011). As for psychotropic substances, the study was focussed on nicotine (NIC), caffeine (CAF), cocaine (COC) and cannabinoids (CBs), i.e. the sum of cannabiniol, cannabidiol and Δ^9 -tetrahydrocannabinol. Measurements were made in Rome, Italy, at schools, private houses and offices (non-industrial workplaces) both indoors and outdoors (Table 1). The ambient data were compared to those detected at the monitoring stations belonging to Regional Pollution Network of ARPA Lazio. This kind of measurements was accompanied by those of regulated toxicants (PM_{2.5}, O₃, NO₂), to account for possible interferences.

Table 1. Timetable of sites investigated (2011-12)

year time	schools	offices	houses
Nov-Dec	3	0	0
Jan-Feb	0	1	4
May-Jun	3	1	0
Jun-Jul	0	0	4

Measurements were made in winter and spring-summer seasons, in order to confirm the different concentration levels usually detected.

All procedures adopted in this study, previously validated by CNR-IIA (Cecinato et al 2009), were modified to be applied to indoor environments. They included the PM collection over 24h (starting at 08:00h), sample pooling, solvent extraction, alumina column chromatography, and GC-MSD (EI-SIM) analysis. Two time schedules were chosen for this investigation, i.e. five-day (Monday to Friday) and two-day (Saturday and Sunday), to discriminate weekdays from weekends.

Results

Nicotine, caffeine and cocaine were detected at all sites investigated, and indoor concentrations were comparable to those detected outdoors. None site was known as subjected to inner sources of cocaine and CBs, as a consequence external illicit psychotropic substances

efficiently penetrated indoor environment. Generally, seasonal trends were observed with winter levels higher than the spring-summer ones. The decrease was particularly relevant for CBs. Remarkable is the finding that CBs inside appear higher than outside, suggesting an effect of accumulation (see Fig.1) (Cecinato et al 2012). Different ratios indoor/outdoor concentration can be found according to the site and the substances taken in account. Differences can be observed also according to the days of the week.

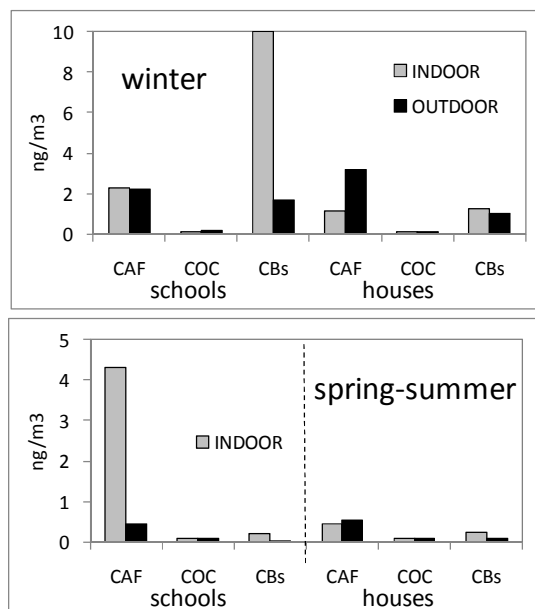


Figure 1. Winter and spring/summer levels of airborne psychotropic substances valued indoors and outdoors

Conclusions

PSs (comprising the illicit ones) affect indoor environments degrees often higher than outdoor air.

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