



## **Settled dust in preschools: characterization and genotoxicity of trace metals and polycyclic aromatic hydrocarbons**

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# SETTLED DUST IN PRESCHOOLS:

## CHARACTERIZATION AND GENOTOXICITY OF TRACE METALS AND POLYCYCLIC AROMATIC HYDROCARBONS

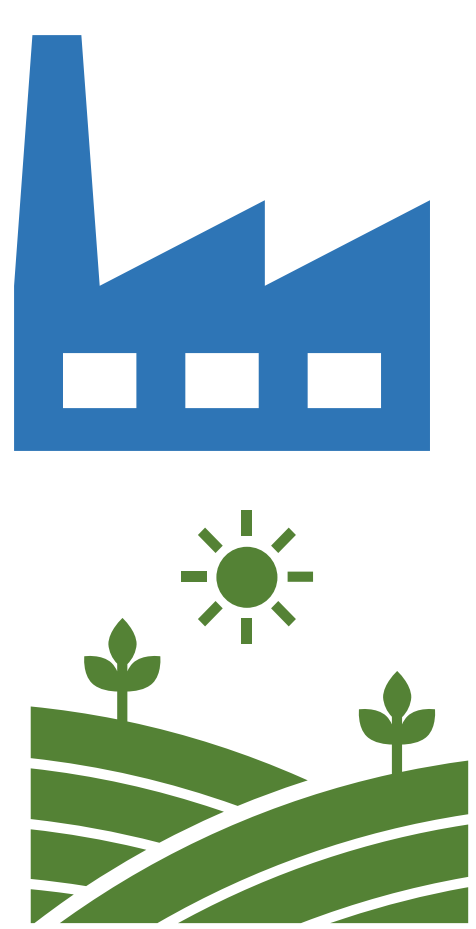


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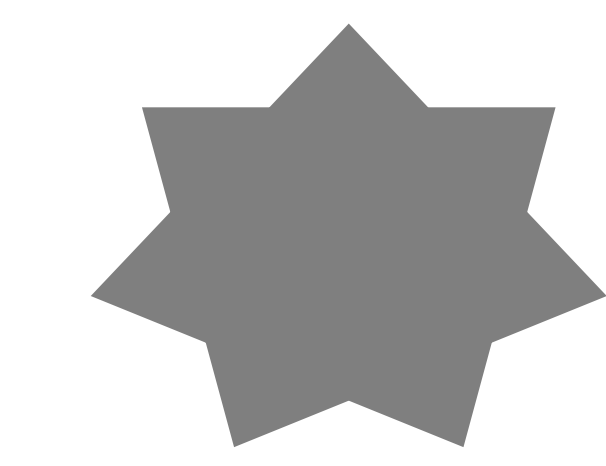
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### CONTEXT

#### Anthropogenic sources



#### Natural sources



Dust < 250 µm

Contain **trace metals** and **polycyclic aromatic hydrocarbons (PAH)**  
→ Ubiquitous + **carcinogenic**



**Involuntary ingestion:**  
**20 - 100 mg of dust per day**  
→ Early biological events

### HYPOTHESIS

Children below 6 years old could be exposed to potentially harmful compounds and elements *via* ingestion of settled dust.

### AIMS

1. **Characterize** settled dust in preschools located in different environmental contexts
2. **Evaluate DNA and chromosomal damage** in gastric cells of **pollutants' mixtures** and **settled dust**

### DUST SAMPLING & CHARACTERIZATION

#### Samplings of settled dust in preschools of Bouches-du-Rhône (France)

2015 -2016 / 2020-2021



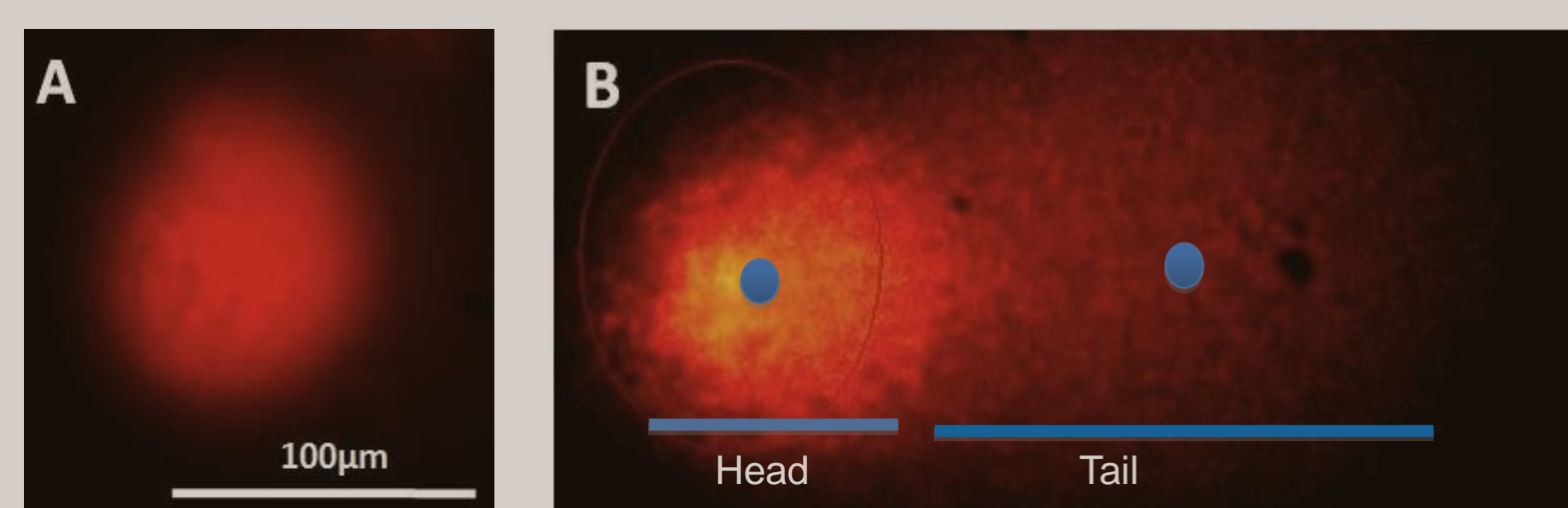
Figure 1: environmental contexts of the sampled preschools

#### Physical and chemical characterization of settled dust

PAHs: HPLC-PFD / Trace metals: ICP-MS

#### *In vitro* toxicity on gastric cells of settled dust extracts and mixtures

**Cytotoxicity & Genotoxicity assays**



**Comet assay:**  
DNA damage

**Cytokinesis Block Micronucleus assay:** chromosomal damage

### COMPOUNDS LEVELS IN SAMPLED DUSTS

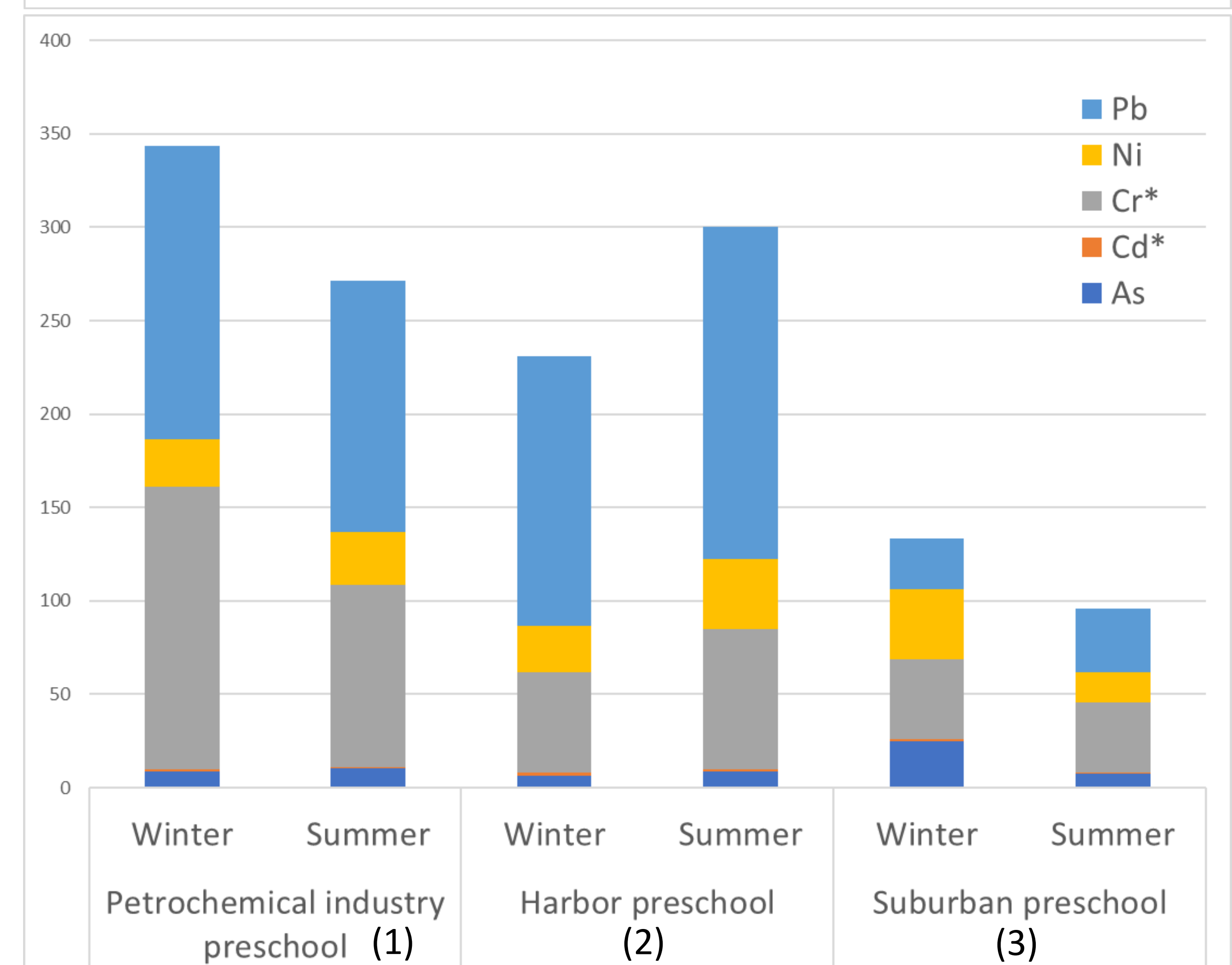
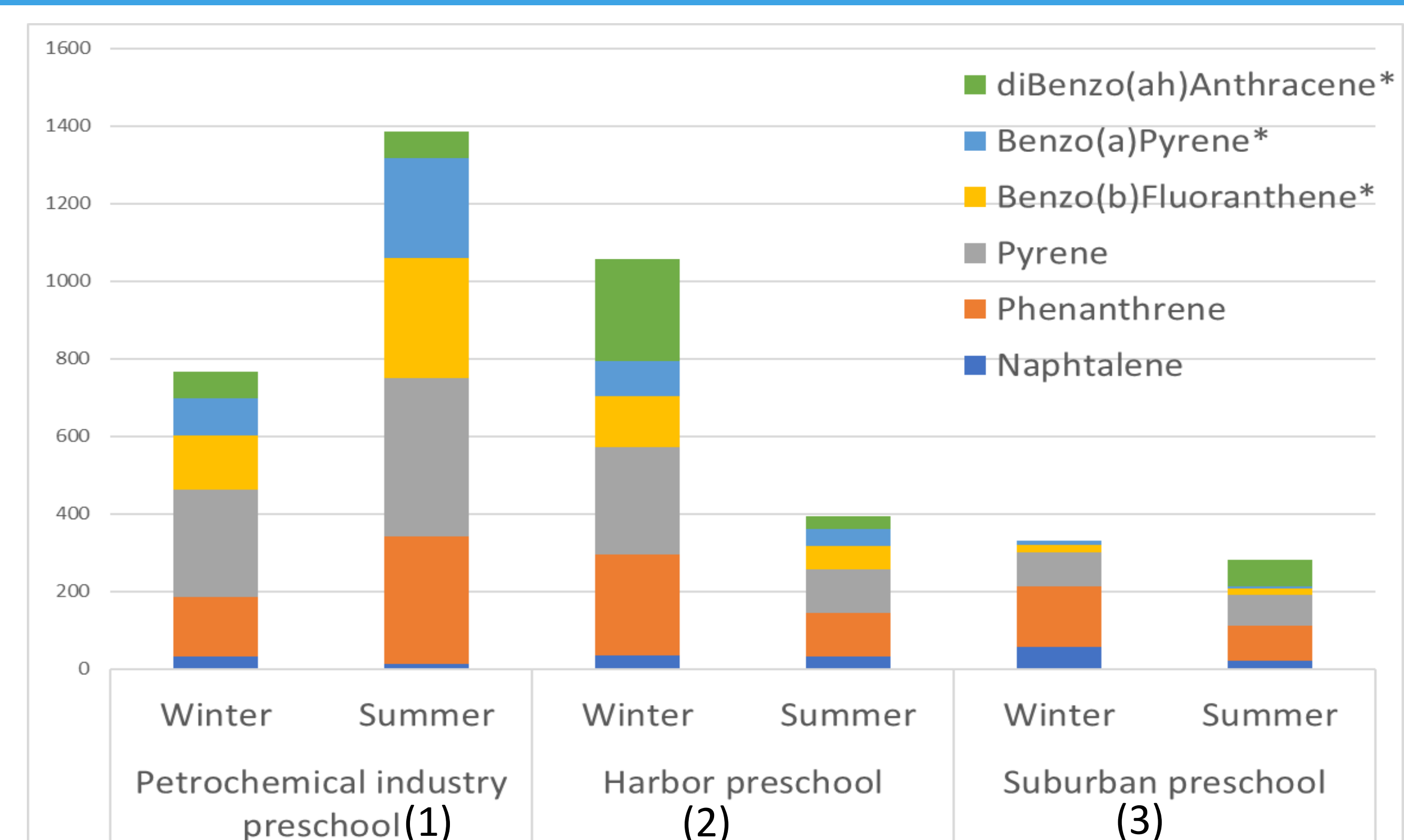


Figure 2: concentrations of 6 PAH (A) and of 5 trace metals (B) of interest in 3 preschools, in winter and summer 2015-2016, \* = carcinogenic

### PERSPECTIVES

Contribution to the understanding of:

- input of soil and aerial deposition of TM and PAH on settled dust,
- interactions between compounds in the occurrence of genotoxic hazard,
- hazards due to soil or settled dust ingestion.

Proposition of alternative *in vitro* tools for human health risk assessment of micropollutants in mixtures on contaminated soils.



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