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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



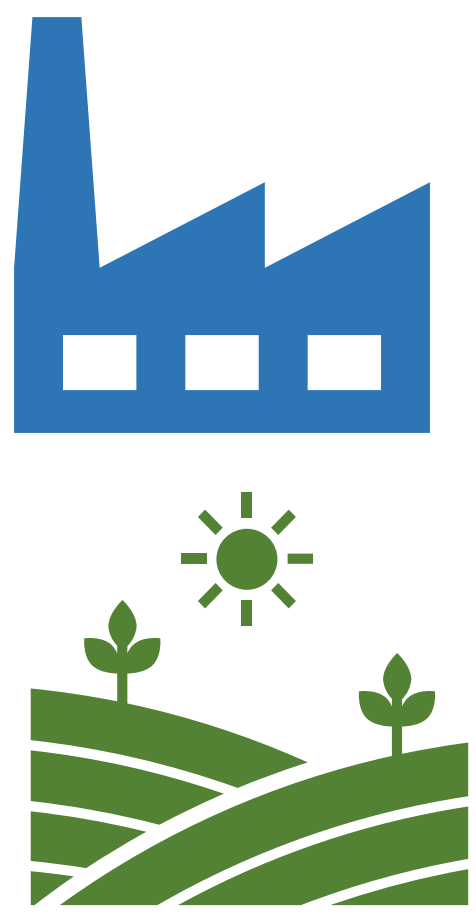
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CONTEXT

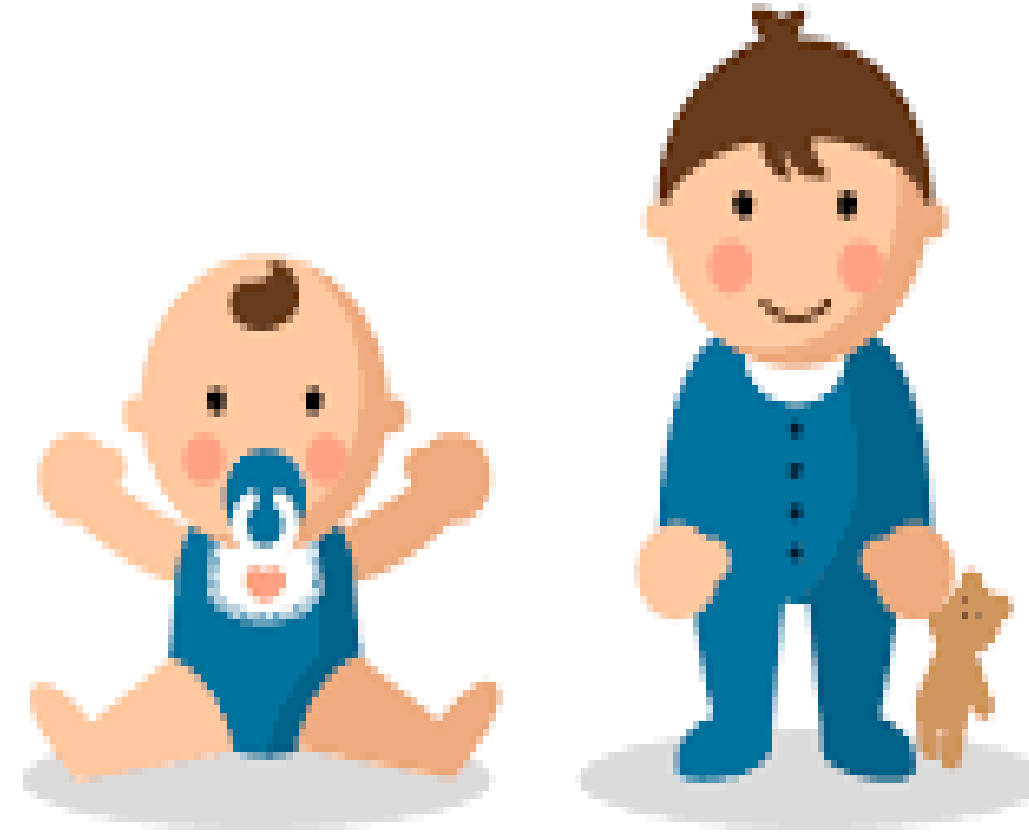
HYPOTHESIS

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

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

COMPOUNDS LEVELS IN SAMPLED DUSTS

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

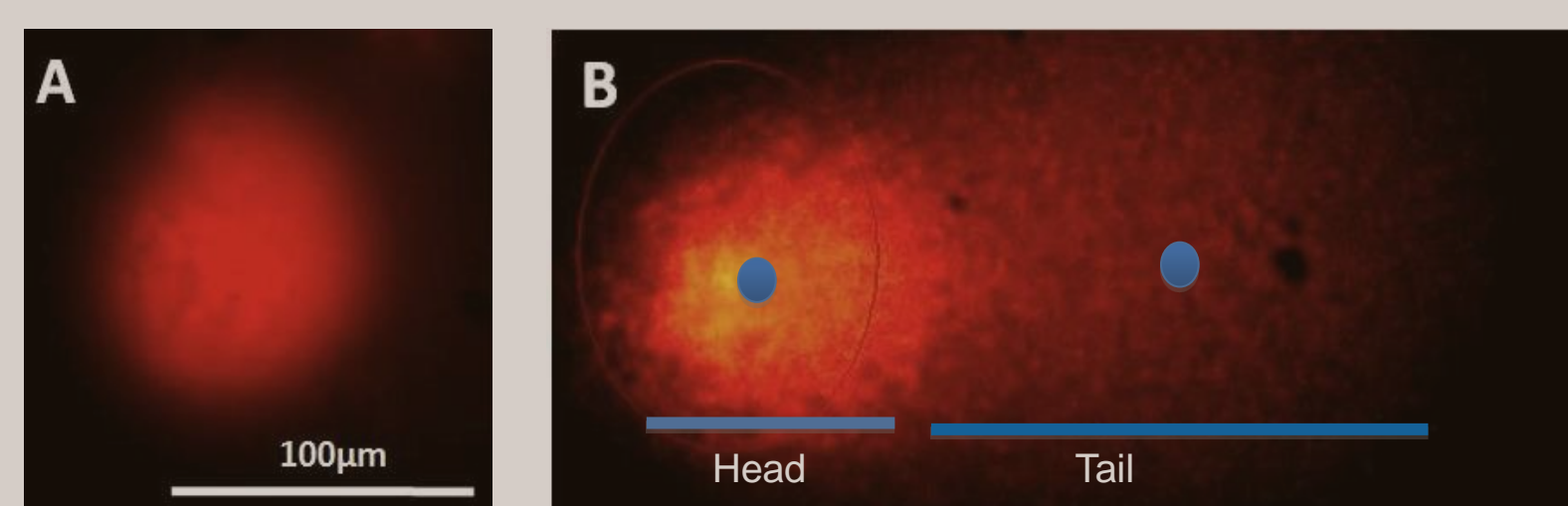
2015 -2016 / 2020-2021



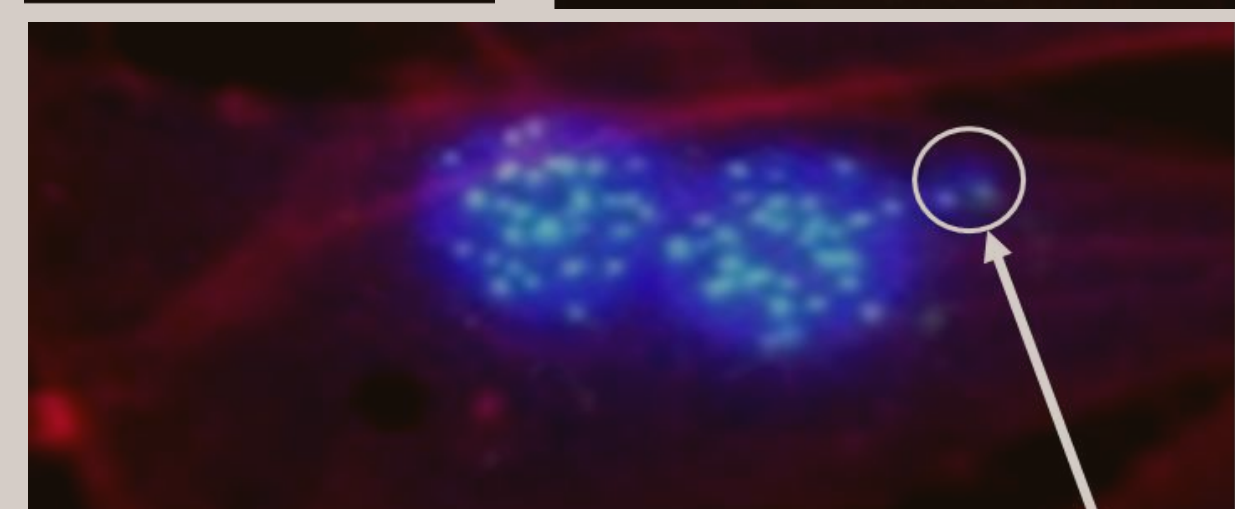
Figure 1: environmental contexts of the sampled preschools

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

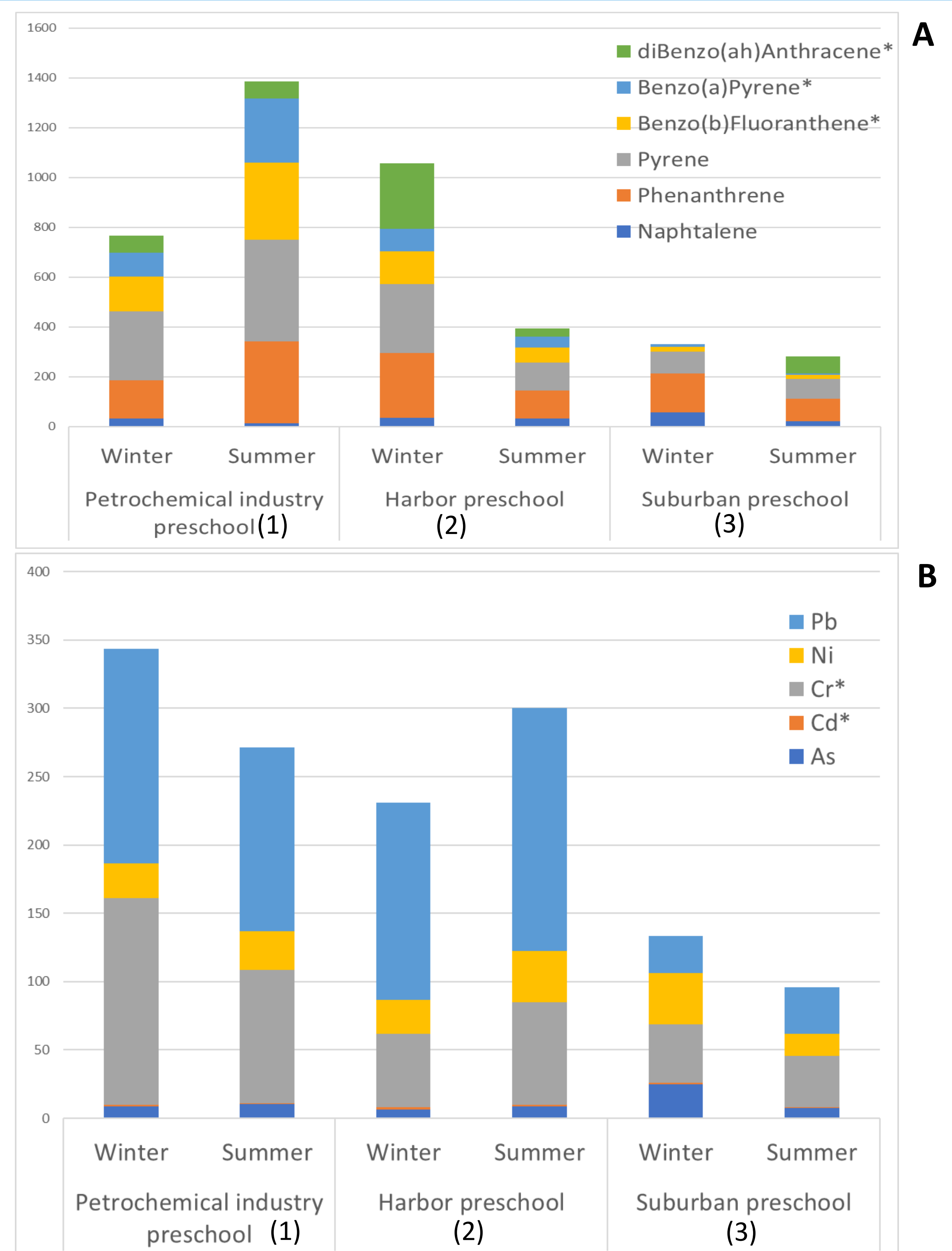


Figure 2: concentrations of 6 PAH (A) and of 5 trace metals (B) of interest in 3 preschools, in winter and summer 2015-2016, * = carcinogenic

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.



International Symposium of Labex DRIIHM - 2021
Inter-Disciplinary Research Facility on Human-Environment Interactions - ANR-11-LABX-0010

6-8 September 2021- Toulouse (France)

