SHORT-TERM STUDY ON THE FATE OF ORGANIC CONTAMINANTS IN SOIL AFTER THE APPLICATION OF BIOWASTE COMPOST OR BIOGAS DIGESTATE

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OBJECTIVE

To evaluate the **fate of 32 organic contaminants in soil** under real environmental conditions in a short-term field experiment. The **effect of two organic amendments** (biowaste compost and biogas digestate) **on the fate of these contaminants** was assessed **analysing their content** (total and bioavailable) in soil **before and after** applying the treated wastes as amendments.
Soil samples were collected **at time 0, 3, 7 and 12 months** and stored dry until analysis.

32 Target analytes

- 18 Polycyclic aromatic hydrocarbons (PAHs)
- 7 Polychlorinated biphenyls (PCBs)
- 2 Alkylphenols: Octylphenol and Nonylphenol
- 2 Personal care products: methylparaben and propylparaben
- 3 Organophosphates: tri-n-butyl phosphate (TBP), tris(2-chloroethyl) phosphate (TCEP) and tris(2-chloroisopropyl) phosphate (TCPP).

SAMPLE PREPARATION

Exhaustive extraction (organic solvents)

Soft extraction (water)

Total content fraction

(Bio)available fraction

ANALYSIS

Gas chromatography coupled to a triple quadrupole mass spectrometer (GC-MS/MS)

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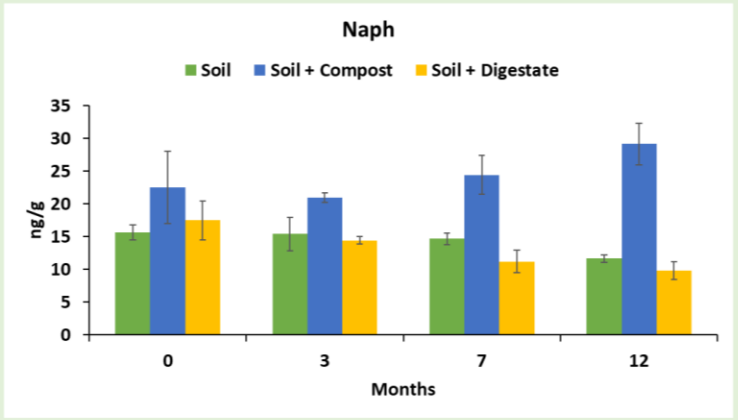
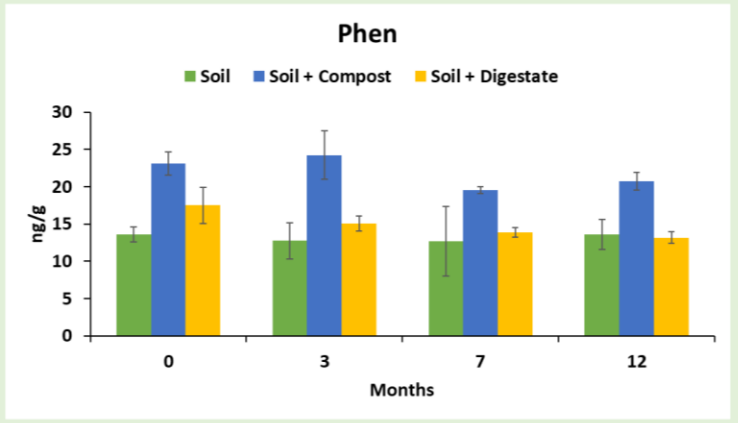
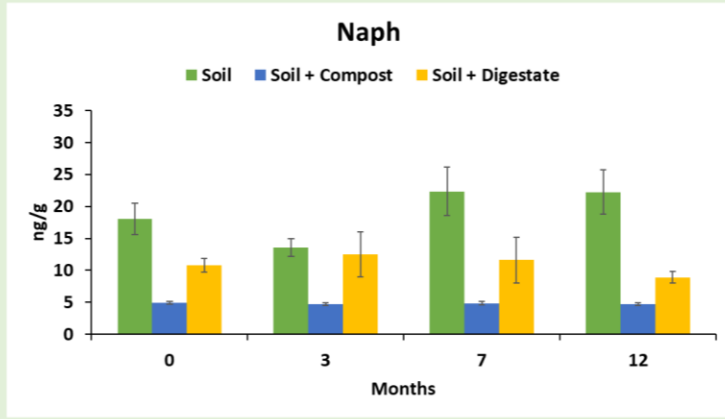
SOME RESULTS

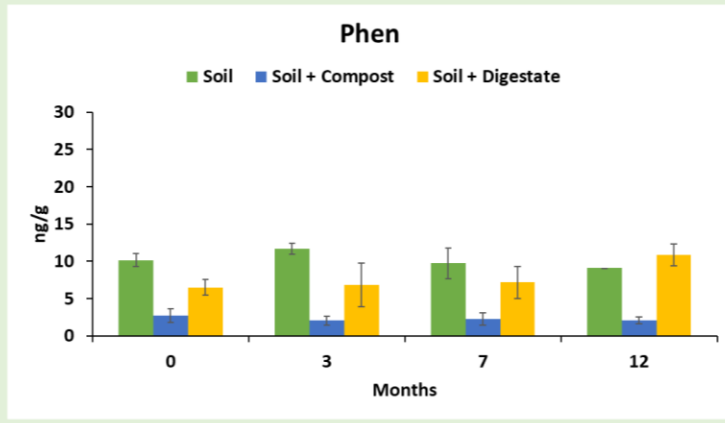
TOTAL LOAD





BIOAVAILABLE FRACTION





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CONCLUSIONS

- The analysis of the bioavailable fraction of the soil suggests that **the contaminants are more readily adsorbed in compost-treated soil,** resulting in lower availability of contaminants in the aqueous fraction.

- Although an increase in the concentration of some target contaminants was observed immediately after soil amendment, **the overall concentration remained constant for the 12 months following application**.

- The analysis of the soluble fraction shows that **the availability of the compounds remains throughout the 12-month period.**

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