

## **PAH plant uptake prediction: evaluation of combined availability tools and modeling approach**

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Transfer to plant is one of the main human exposure pathways of polycyclic aromatic hydrocarbons (PAH) from contaminated soils. However existing models implemented in risk assessment tools mostly rely on i) total contaminant concentration and ii) plant uptake models based on hydroponics experiments established with pesticides (Briggs et al., 1982, 1983). Total concentrations of soil contaminants are useful to indicate pollution, however they do not necessarily indicate risk. Methods describing actual bioavailability of soil contaminant are supposed to give more accurate and realistic risk assessments. However these methods still need to be validated and some guidelines for their selection, implementation and interpretation need to be established. As part of the IBRACS project ("Integrating Bioavailability in Risk Assessment of Contaminated Soils: opportunities and feasibilities", <http://projects.swedgeo.se/ibracs/>), a SNOWMAN research project, we evaluated how two availability tools, Tenax extraction and POM pore water estimate, could predict PAH plant uptake using the Briggs models. Maize was cultivated for five weeks on fourteen contaminated industrial soils from Belgium, France and Sweden. Total PAH concentrations were determined in roots and shoots and compared to those estimated from Tenax extraction, POM and total concentrations. As a result, both availability measurement methods gave similar estimation of PAH pore water concentrations. However those concentrations lead to underestimate actual root and shoot uptakes calculated using classical uptake models. In this case, total soil concentration correlated better to actual uptake and gave more accurate predictions. Those results would suggest an alternative uptake pathway involving direct contact between roots and soil particles.

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