

Uranium uptake and accumulation in *Phragmites australis* Trin. ex Steud. depending on phosphorus availability, litter contamination and ecotype.

Brackhage, C., Wartchow, M.

Institute of Ecology and Environmental Protection, TU Dresden, Germany

Macrophytes in natural and constructed wetlands can influence radionuclide and heavy metal immobilisation either directly by uptake and accumulation and/or indirectly (biomass production – litterfall and root turnover – decomposition) providing for complexing substances. We investigated the influence of phosphorus availability in combination with uranium contaminated plant litter on uranium uptake and accumulation as well as productivity in two different ecotypes of *Phragmites australis* Trin. ex Steud. in a culture experiment.

It is shown that decreasing phosphorus fertilization without plant litter results in phosphorus deficiency in the plants (higher N/P-ratio) and hence decreasing biomass production as would be expected. However, decreasing phosphorus availability in the substrate is not correlated with increasing U-concentrations in any of the investigated plant parts but with the overall removal of uranium by plants. Adding a litter layer from *Phragmites australis* is resulting in additional P-availability and hence no observable P-deficiency in the plants. The litter layer is successfully absorbing uranium which was added as uranyl nitrate. This does not result in different uranium concentrations compared to the treatments without a litter layer. Adding a litter layer already contaminated with uranium has the same effect: plants are sufficiently provided with phosphorus but do not exhibit lower uranium concentrations. The same can be stated for treatments with contaminated litter and additional uranium application.

Finally no difference in uranium concentrations was observed für different ecotypes in any of the treatment. Due to different biomass production higher uranium content could be observed for one of the investigated ecotypes.