**The behavior of uptake and decomposition of the herbicide propanil in plant *Bidens pilosa* L. dominating in the Yangtze Three Gorges Reservoir (TGR), China**

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The anti-seasonal hydrology of the Three Gorges Reservoir (TGR) represents a unique wetland ecosystem in the world (MITSCH ET AL, 2008). The huge differences in water fluctuation (30 m) and the specifical biogeography differ from any other wetlands; for instance the plants in the littoral zone area of TGR grow up during summer (rainy season) but they are submerged under water over winter. Due to these conditions, a growing concern has emerged regarding to the topics of environmental contamination and biology of TGR, e.g., the vegetation succession and the fate of pollutants under TGR hydrology.

Wetland vegetation not only provides primary products and a habitat for various biota, but also strongly influences the process of elemental biogeochemical cycles. In recent decades the use of wetland plants for contaminant elimination has become more and more popular around the world (WILLIAMS, 2002), which is a cost effective approach--phytoremediation. However, in consideration of the plants in the littoral zone of TGR, which are affected by water level fluctuation, there is a necessity to verify the behavior of plant uptake and decay.

In the present study we investigated the fate of the broadly used herbicide propanil in *Bidens pilosa* L. under TGR hydrology conditions. Plants pre-treated with 14C-ring-labeled propanil were either (experiment a) directly submerged in TGR water for 90 days or (experiment b) pre-treated with organic solvents to remove the extractable pesticide residues and, subsequently, only the plant insoluble material containing the pesticide non-extractable residues (NER) were incubated in TGR water. Thereby the decomposition processes of the whole intact plant as well as of the plant NER fractions were studied in parallel.

Experiment (a): The results indicated that 14C-pesticide residues were released faster than plant natural materials, determined by measurement of the dissolved organic carbon (DOC) fraction in the water. After soaking in water, 30% of the applied radioactivity (AR) was released into water and, simultaneously, the amount of NER in the plant debris increased with time and finally amounted to 40% of AR. The 14C-compounds in the extractable fractions have been identified as the parent compound (propanil), and the metabolites 3,4-dichloroaniline (3,4-DCA) and *N*-(3,4-dichlorophenyl)-β-D-glucopyranosylamine (D-Glu-3,4-DCA).

Experiment (b): Also when submerging the pre-extracted plant material the release peak of radioactive pesticide residues was observed earlier than that of DOC. Significant portions of 14C were released to the water phase (6% of AR) from the NER fraction and the compounds were conformed to agree with those analyzed in the extracted fractions (see above).

Therefore pesticide residues taken up by plants again enter the aquatic environment after plant death with potential impact on aquatic organisms, which to our knowledge has not been reported before. As plant uptake and the decay process are recognized as a detoxification process, we consider *B. pilosa* L. as potential species for phytoremediation of xenobiotics, such as herbicide propanil in TGR area.