

Distribution and transformation of emerging pollutants at the SWI

HENNING SCHROEDER^{1*}, LARS DUESTER¹, ARNE WICK¹

¹Federal Institute of Hydrology, Am Mainzer Tor 1, 56068 Koblenz, Germany

(*correspondence: Henning.Schroeder@bafg.de)

The fate of many chemical pollutants entering the aquatic environment is decisively determined by processes at the sediment water interface (SWI). In the narrow zone at, in and below SWIs sorption may limit the mobility and biological or inorganic transformation may occur. As a consequence the transformation products may be released from the SWI, undergo again sorption or can stepwise be mineralised.

To study the fate of organic pollutants and the partitioning between solid- and liquid phase as well as potential transformation at the SWI, the capabilities of the recently introduced suction-based sampling system for pore water depth profiles (meso profiling and sampling system *messy*)[1-3] was expanded to address spatial and temporal concentration gradients of several emerging pollutants.

In a 43 days lasting incubation/spiking experiment 12 pharmaceuticals (carbamazepine, fluconazole, metoprolol, tramadol, diclofenac, gabapentin, valsartan, acyclovir, sitagliptin, furosemide, fexofenadine, ceterizine), 4 metabolites (10-hydroxycarbamazepine, oxypurinol, ramiprilat, clopidogrel acid), 2 radiocontrast agents (iopromide, diatrizoate), 2 artificial sweeteners (sucralose, acesulfame) and 2 herbicides (diuron, terbutylazine) were studied with respect to their distribution across the SWI and degradation in 23 pore water depth profiles from -1 to 5 cm depth.

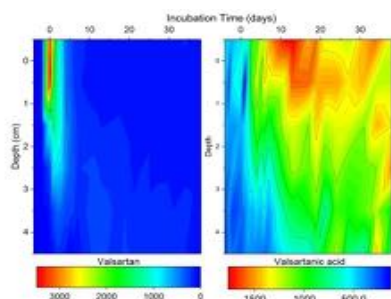


Figure 1: Concentrations of valsartan and valsartanic acid across the SWI during the incubation/spiking experiment.

[1] Fabricius *et al.* (2014) *Environmental Science & Technology* **48**, (14), 8053-806. [2] Schroeder *et al.* (2017) *Chemosphere* **179**, 185-193. [3] Schroeder *et al.* (2019) *Sci Total Environ* **651**, (Pt 2), 2130-2138.