



Post-depositional distribution of selected PAHs, PCBs and organochlorine pesticides in the mixed zone of the surface sediments in the Thau Lagoon (Mediterranean)

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We have undertaken a comprehensive study of the post-depositional distribution of selected PAHs, PCBs and organochlorine pesticides (OCPs) in the mixed zone of the surface sediments in the Thau Lagoon (Mediterranean). The presented results are based on the concentration depth profiles of the selected compounds and radionuclides (Th-234, Be-7, Pb-210, Cs-137) within the upper several centimeters of sediment cores as well as their profiles in the laminated deeper sediments. Sediment cores were collected in May 2004, and November 2005. Actual distributions of the compounds and radionuclides exhibit different profiles within near-surface sediments. Indeed, T11 and T12 sites represent two contrasted situations of almost non-disturbed and mixed sediment to the depth on the order of 8 centimeters. At T12 the stratigraphic record of PAHs shows almost constant concentration profile within mixed zone in contrast to the constant linear decrease observed at T11. Furthermore, the slopes of PCB and OCP profiles within near surface sediments at both sites are different. These different chemical records are attributed to the biological reworking (bioturbation) of near-surface sediments as well as to varying rates of the addition of new material (chemical flux rates) into sediments. At T12, the net effect for PAHs contaminant dispersal is almost a complete homogenization. Whereas, the mixing is incomplete for PCBs and OCPs at this site, and the distribution of these contaminants might be more sensitive to the nature of mixing process (ex. particle-sensitive, contaminant-sensitive diffusion process). These time series data provide the opportunity to test by modeling the sensibility of the contaminants dispersal in the mixed zone to different scenarios of

sedimentation, bioturbation and chemical flux rates. Further understanding of these post-depositional processes affecting recent sedimentary chemical records is central for accurate reconstruction of contamination history and building of chemical sedimentary budgets in the Thau Lagoon.