Abstract

Polychlorinated biphenyls (PCBs) are a class of important organic pollutants which undergo very slow degradation and tend to persist for a long time in the environment. PCBs have various negative effects on living organisms, human health and the environment in general. A method for determining PCB levels in aqueous matrices was developed consisting of solid-phase extraction (SPE) and GC/MS determination. The average recoveries of PCB congeners from artificially spiked deionized water were around 85%. The PCB concentration of 3.3±0.1 $\mu g \cdot l^{-1}$ (a sum of selected congeners) was detected in contaminated groundwater originated from the area of a former asphalt concrete producing plant. The most abundant PCBs were trichlorinated congeners which together comprised about 80% of the total PCB content. The optimised SPE method was further applied together with accelerated solvent extraction (ASE) to assess the degradation potential of oyster mushroom (*Pleurotus ostreatus*) which shows high degradation efficiency of various organic pollutants including PCBs. *P. ostreatus* belongs to ligninolytic (white-rot) fungi, which is a very promising group of microorganisms frequently studied due to their bioremediation potential. *P. ostreatus*, strain KRYOS was able to remove 41±8% of the initial amount (50 μg) of the commercial PCB mixture Delor 103 after four weeks of degradation. The growth of the fungal culture during the experiment wasn't influenced by the presence of PCBs. A continuous-flow bioreactor was also applied to study PCB degradation from artificially spiked water which resulted in 100% PCB removal form the water matrix and 72–80% removal of the total PCB content (residual amount of PCBs was detected in the growth substrate).