Polychlorinated biphenyls (PCB) represent relevant persistent organopollutants of the environment and the estimated amount of PCB released into the environment is 750000 metric tons. White-rot fungi have been studied for long time due to their degradative potential toward various aromatic pollutants and it is known that these fungi are able to decompose PCB *in vivo*. Biodegradation of PCB by the fungus *Pleurotus ostreatus* was studied in the frame of this work. A high degradative efficiency of *P. ostreatus* was observed in the first set of experiments, even in the presence of relative high amount of added PCB. Fungus was able to transform 780±50 μg out of the intial amount 1000 μg in 20 ml of a cultivation media within 42 days. A decrease in toxicity was recorded during the degradation that suggests the suitability of this organism for a practical use in decontamination. *In vitro* experiments with purified laccase induced with Cu^{2+} from this fungus did not prove any participation of the enzyme in the first step of PCB transformation. The enzyme did not show an ability to degrade PCB even after purification from cultivation media containing PCB. It was found that the first step of PCB transformation can be performed by an intracellular process with microsomal fraction. A degradation of 44-67% was observed for selected PCB congeners possessing from 2 to 5 chlorine substituents. The degradation mechanism has not been clarified, however, the process include probably two mechanisms. Characterized PCB degradation products suggest a presence of a dechloration mechanism that allows a further degradation of the produced lower chlorinated intermediates. (In Czech)