ABSTRACT

In this work endocrine disrupting potential of Delor 103, a commercial mixture of PCB congeners, was studied along with its effect on production of laccase by the ligninolytic fungus *Trametes versicolor*.

Using a gene-reporter yeast assay for evaluation of hormonal activity Delor 103 showed an androgenic activity with an EC_{50} value of $2.29 \cdot 10^{-2}$ mg/l. Chlorbenzoic acids, Delor 103 potential metabolites resulting from microbial degradation, displayed on the other hand an estrogenic activity, indicating possible changes in hormonal activity of Delor 103 during its microbial degradation.

The addition of Delor 103 to mineral medium *T. versicolor* cultures resulted in an up to 257times higher laccase activities detected in fungal cultures. Delor 103 induced enzymes showed different p*I* values from those of control cultures. In a complex malt-extract glucose medium (MEG) the stimulation effect of Delor 103 was kept down. Further, the production of laccase and synthesis of different p*I* forms depended strongly on the growth phase of fungal cultures. Exponencially growing cultures of *T. versicolor* were able to produce up to 7 different p*I* forms of laccase in responce to Delor 103 whereas stationary cultures produced only 4 enzyme forms with higher p*I* values.

Stimulation of laccase activities in *T. versicolor*, however, did not correlate with Delor 103 degradation by the fungal cultures. The highest Delor 103 removal was observed in MEG cultures with low laccase activity. Concurently, stationary phase cultures were not able significantly degrade Delor 103, although laccase activity stimulation and an induction of laccase encoding genes transcription was observed in these cultures.

In vitro experiments revealed that Delor 103 addition to fungal cultures affected also dye decolorization and Delor 103 degradation potential of culture supernatants. The most efficient Delor 103 degradation was observed with Delor 103 induced enzymes with p*I* of 3.5 - 3.6. On the contrary, most efficient dye decolorization was observed with control culture supernatants containing laccases with higher p*I* (3.0 - 4.0).

Key words: *Trametes versicolor*, Delor 103, laccase, PCB biodegradation, gene expression, endocrine disrupting compounds