



Response of soil dehydrogenase activity on chromium (iii,vi) contamination and its reflect time

A. Wolińska, Z. Stepniewska

John Paul II Catholic University of Lublin, Department of Biochemistry and Environ. Chemistry, Kraśnicka 102, 20-718 Lublin, Poland, (awolin@kul.lublin.pl)

The paper presents the impact of chromium (III) and (VI) forms on the soil dehydrogenase activity at different time of metals effect on soil material. The *Orthic Rendzinas* and *Mollic Gleysol* from upper horizon were used to experiment. The soil samples were amended with Cr (III) as a CrCl_3 and with Cr (VI) as a $\text{K}_2\text{Cr}_2\text{O}_7$ in the concentration range from 0 to 20 mg/dm^{-3} . Readouts of dehydrogenase activity after 20 hours and 2, 4 and 7 days of incubation were performed. It was found that, soil dehydrogenase activity is able to change, depending to dose of chromium forms and reflect time. In the *Mollic Gleysol* soil samples maximum of dehydrogenase activity as a result of 5 mg/dm^{-3} Cr(III) at 2^{nd} day of incubation was reached, whilst for Cr (VI) the highest value of enzymatic activity after 7 days of incubation with dose 10 mg/dm^{-3} of Cr(VI) was estimated. Usually decreasing trend of enzymatic activity with higher Cr (III) concentration was noted. However, in the *Orthic Rendzinas* enzymatic activity reached their maximum as follow: after 7 days of incubation with 5 mg/dm^{-3} of Cr(III) supplement and 2 mg/dm^{-3} of Cr(VI) at the 2^{nd} day of incubation. In contrast to *Mollic Gleysol*, dehydrogenase activity in *Orthic Rendzinas* increased with dosage of chromium. Generally, Cr (VI) compounds considered to be a strong toxicant limited dehydrogenase activity not in the same way. In the *Mollic Gleysol* after one week incubation tendency for stimulation of activity as a consequence of 10 and 20 mg/dm^{-3} of Cr (VI) was found and compromised on 22% of the control activity. Meanwhile, in the *Orthic Rendzinas* 42% growth of dehydrogenase activity after 2 mg/dm^{-3} of Cr (VI) amendments after 2 day of incubation was estimated.