

BEHAVIOR ANALYSIS OF *Klebsiella oxytoca* CIP 79.32 IN SOLUTIONS CONTAINING HEXAVALENT CHROMIUM

Authors Spagiari, M.S. ¹, Brito, M.B. ², Pereira, J.Q. ³, Bizani, D. ²

Institution ¹ UFRGS – Universidade Federal do Rio Grande do Sul (Rua Sarmento Leite, 500 – Centro – Porto Alegre, RS), ² UNILASALLE – Centro Universitário La Salle (Avenida Victor Barreto, 2288 – Centro – Canoas, RS), ³ UFRGS – Universidade Federal do Rio Grande do Sul (Avenida Bento Gonçalves, 9500 – Agronomia – Porto Alegre, RS)

Abstract:

With increasing technological and industrial development, a lot of contaminants, both industrial character, as agriculture is increasing in Brazil in recent decades. Numerous techniques aimed at reducing aggression that these cause to the environment. Numerous techniques aim to decrease the aggressions, this cause to the environment. However, such techniques alone are not enough to control the degradation suffered by natural resources. For the reduction of impacts caused by environment, bioremediation emerges as a process through the use of micro-organisms able to change or break down contaminants. This research exposes a study on the behavior of *Klebsiella oxytoca* CIP 79.32 in solutions containing hexavalent chromium. The standard strain investigated in the experiment was obtained from André Tosello Foundation, and re-suspended in BHI broth for 24 hours at 32 °C. For the production of synthetic sewage was prepared a potassium dichromate solution at a concentration of 300 mg L⁻¹ of hexavalent chromium, along with BHI broth as unique source of carbon, and the volume of micro-organism used had 5 mL in volume. The synthetic sewage was adopted for the determination of the bio-reduction of the contaminant, within seven days to 32°C, by colorimetric method of S-diphenylcarbazide, used four samples and quantified in triplicate. For chromate reductase enzyme activity in the extracellular medium were used three concentrations of chromium in 75, 150 and 300 mg L⁻¹ to 32 °C for 48 hours, analyzed the possible enzymatic activity by polyacrylamide gel electrophoresis, having a white without the presence of chromium, as negative parameter for the enzyme. It observed a reduction in the rate of chromium present in the inoculum, an average of 93 % for the four samples. However, the micro-organism, has not presented any enzyme activity in the extracellular medium, whereas literature reports suggest the bio-reduction of chromium as an intracellular mechanism. The results obtained permit the application of the lineage of *k. oxytoca* CIP 79.32, in bioremediation, processes by high bio-reduction rate of hexavalent chromium in the synthetic sewage.

Keywords: Hexavalent chromium, *Klebsiella oxytoca* CIP 79.32, Bioremediation.

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