

Bioremediation of soil contaminated with copper and cadmium by the yeast *Yarrowia lipolytica*

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The increase in availability of heavy metals in the environment occurs by the populational growth and expansion of industrial activities. High amounts of toxic metals reduce the quality of ecosystems and harm the development of the species. Among these elements, cadmium (Cd) and copper (Cu) stand out as priority contaminants. In this sense, some microorganisms such as yeast *Yarrowia lipolytica*, are seen as potential bioremediators of environments by become unavailable different contaminants for others organisms. This study aimed to investigate the bioremediator potential of the strains of *Y. lipolytica* (UENF-1 e UENF-2) in soils contaminated by Cd and Cu. Through the Minimum Inhibitory Concentration (MIC) assays was possible to observe the ability of tolerance of the yeast to different concentrations of Cd and Cu. Both strains tolerated concentrations of 1, 2, 4 and 6 mM of CuSO₄, while 8 mM inhibited the growth of UENF-1. The presence of CdCl₂ reduced the growth of UENF-1 at concentrations of 50 and 100 µM, and inhibited growth at 250 µM. The UENF-2 strain did not grow from the concentration of 100 µM CdCl₂. The cultivation of corn (*Zea mays*) in soils contaminated by 50 µM of CdCl₂ and 500 µM of CuSO₄ showed the effect of the yeast as bioremediator. The corn cultivated with the UENF-2 strain in the presence of Cd showed higher shoot mass growth (14.90 ± 0.67 g) and height (66,13 ± 3,82 cm) when compared to control (10,38 ± 1,20 g e 59,88 ± 2,17 cm, respectively). It was also observed for UENF-1 strain in contaminated soils with Cu had greater stem diameter (0.62 ± 0.02 cm) compared to the control (0.53 ± 0.02 cm). Therefore, *Y. lipolytica* revealed to be a tolerant microorganism to the tested concentrations of Cu and Cd and potential bioremediator of contaminated soils.

Keywords: heavy metals, microorganisms, pollutants

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