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PHYTOPATHOGENIC FUNGI: AN ALTERNATIVE TO REMOVAL CHROMIUM HEXAVALENT

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Introduction. The importance of vegetables in human nutrition is well-known. Vegetables are also source of nutrients for fungi and others microbs. Most of the vegetables are attacked by the fungi in field, transit and storage conditions(1). The contamination of water by toxic heavy metals is a worldwide environmental problem. The Chromium hexavalent form has been considered hazardous to public health due to its mutagenic and carcinogenic properties (2). Uptake of heavy metal ions by fungal microorganisms may offer an alternative method for their removal from wastewater. Therefore, biosorption carried out by fungi could serve as an economical means of treating effluents charged with toxic metallic ions (3,4).The aim of present work was tested the uptake chromium hexavalent capacities in solution by Rhizopus sp. and Alternaria sp.

Methods. The fungi were isolated from samples vegetables following the tissue planting method on PDA medium supplemented with cloranfenicol. The fungi were characterized by micro and macroscopic morphology. Minimum inhibitory concentrations (MIC) of Cr (VI) were determined for the isolated fungi. In based on the obtained results, it were performed growth kinetics and adsorption of Cr (VI). Growth of the fungus was monitored by determination of reducing sugars. To determine the concentration of chromium (VI) technique was used for AAS.

Results. The identification was achieved by placing a drop of the stain on clean slide with the aid of a mounting needle, where a small portion of the mycelium from the fungal cultures was removed and placed in a drop of lactophenol. The slide was then mounted and observed with x10 and x40 objective lenses respectively. The species encountered were identified as *Alternaria* sp and *Rhizpus* sp. The fungi were resistant in all tested concentrations (2.5-100 mg/L) in MCI, however the growth was slow in high concentrations of Cr (VI).The data obtained in the determination of reducing sugars with medium supplemented with 100 mg/L of Cr(VI) show no difference with respect to control strains, which were inoculated with 1 x 10^6 conidies/mL, and maintained at 28°C for 7 days. Samples from the growth kinetics were analyzed by AAS and demonstrated good uptake capacities. Figure 1 shows data setting to the second order model, suggesting that the process is mass transfer, ie may be a surface phenomenon.

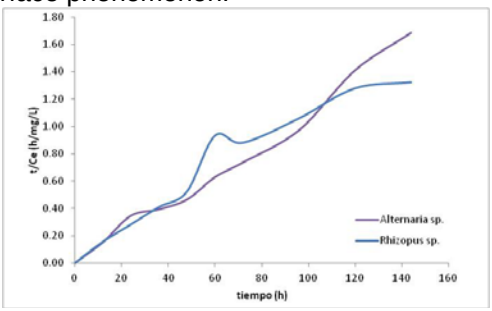

Fig.1 Linearized pseudo-second order kinetics.

Table 1 showed the results of the linearized pseduo-second order model. The data demonstrated that *Alternaria* sp. exhibits better uptake metal than *Rhizopus* sp. this results are consequence of a high biomass production in the media added with metal.

Table 1. Linearized pseudo-second order kinetics with both active biomass

	C_m (mg/L)	K (L/mg h)	q (mg/g)	R^2
Alternaria sp.	87.719	0.00838	1283.876	0.986
Rhizopus sp.	103.093	0.00105	992.317	0.941

Conclusions. This study provided a basis for the batch equilibrium studies, which will have an important contribution to the understanding of the biosorption mechanisms. In addition, the information obtained related to kinetic behavior of this complex system would be useful in continuous flow sorption studies.

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