

CHAPTER - XI

CHAPTER XI

REGENERATION OF BIOSORBED Hg⁺⁺ FROM *S.cerevisiae*A100:

Mercury is a valuable metal is widely used in various industries. Availability of mercury is not abundant. Considering these thoughts technology did not stop only in removing the metal from the industrial effluent or wastewater to make the living world free of mercury toxicity, but tried to recover the precious metal from the biosorbed organism for recycling it in various purpose of industrial use.

Internally sequestered mercury is difficult to regenerate but the surface bound mercury can be leached out easily by breaking the chemical bond between the metal and the charge bearing groups present on the cell surface.

In this chapter various elute solutions of acid, alkali, metallic salts are used to recover the biosorbed mercury from the cell surface of the organism. To achieve maximum recovery of the metal parameters like, concentration of elute solution , hours of shaking are considered extensively (385).

Material & Methods:

Preparation of elute solutions for desorption of Hg⁺⁺ from yeast biomass: molar solutions of different elute were prepared by dissolving them in deionized double distilled sterile water. Method of mercury measurement is as described in Chapter 1.

Result & Discussion :

i) Effect of different elute solution on desorption of Hg^{++}

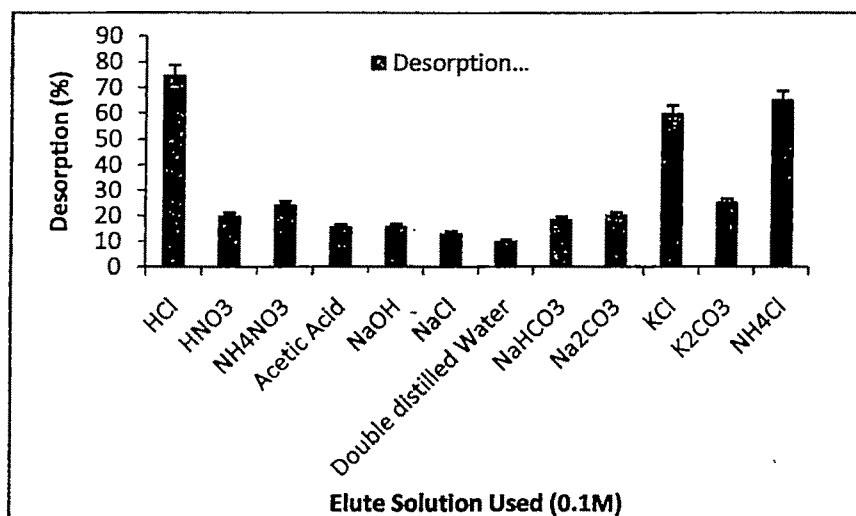


FIGURE 48: EFFECT OF DIFFERENT ELUTE SOLUTIONS ON DESORPTION OF BIOSORBED Hg^{++} FROM *S.cerevisiaeA100*

Fig.48. indicates that HCl is the most effective elute for desorption of biosorbed Hg^{++} . Dilute mineral acids have been used in various studies to leach the metal from metal loaded biomass. Increasing acidity generally leads to an effective removal of metal from biomass (386,387,388,389). HCl is reported to be an efficient elute for regeneration of biosorbed metal by many workers.(133,390).

ii) Effect of various shaking hours:

TABLE 21: EFFECT OF DIFFERENT SHAKING HOURS ON DESORPTION OF Hg^{++}

Elute Solution (0.1M)	Hour of Shaking	Desorption (%)
HCl	19	80.00 ± 0.32
	30	71.45 ± 0.83
	48	69.72 ± 0.52
	19	65.50 ± 0.73
KCl	30	58.00 ± 0.61
	48	55.00 ± 0.50
	19	66.00 ± 0.66
NH ₄ Cl	30	64.50 ± 0.81
	48	63.30 ± 0.27

Desorption Values are expressed as mean ± Standard Deviation

All values of cell growth and biosorption are biologically significant ($p < 0.001$).

Table.21 shows that 19 hours of shaking achieved maximum desorption of Hg^{++} .

iii) Effect of different elute concentration :

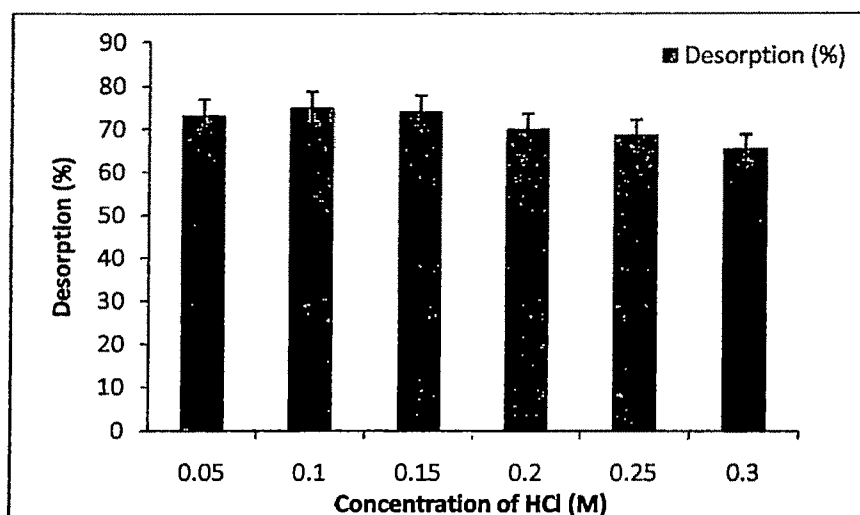


FIGURE 49: EFFECT OF DIFFERENT ELUTE CONCENTRATION ON DESORPTION OF Hg^{++}

Fig.49. indicates that 0.1 M solution of HCl is most effective for desorption of Hg^{++} .