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Study Resistance of (C. tropicalis and C. glabrata) to Some Heavy Metals and Oil Compounds Laboratory

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Abstract
Present study showed that the isolated of yeast (*C. tropicalis* and *C. glabrata*) were resistance for growth in different concentrations of heavy metals (lead, cobalt, cadmium).So too that isolates of yeast are resistance for growth in different concentrations of oil compacts (phenol , naphthalene, biphenyl). These are results showed of capacity of some species of yeasts on growth in different concentrations from environment pollutants .The last the yeasts are ability of bioremediation of pollutants.
Keywords: Yeasts , heavy metals , oil compacts

1- Introduction

Pollution is any change in chemical , physical and biological characteristics of the ecosystem . This change occur by transferring the pollutants from its sources leading to harmful alteration on human health and economy in addition on other organisms . So any charge in the elements of will lead to change at the ecosystem , such as decrease or increase of some elements or sometime absence of one or more elements .(Ibrahem,2013). The difficulty in studying the chemical pollutants took place because the nature of these chemicals . Although these chemical have organic nature but it cannot be analysis by enzymes or other procedures of organic materials.(Amer,2001). There are four groups of the most dangerous pollutants at ecosystem :

1- Heavy metals
2- Polychlorinated biphenyl
3- Polycyclic hydrocarbons
4- Chlorinated pesticides

Many subgroups were included by federal environmental agency (Ame.2001). So anew methods have been applied for decreasing the pollution , some of these methods is more safe than other such as bioremediation for that we apply a bioremediation of these pollutant using microorganism such as yeasts.

2- Materials and methods

1- Isolated of species of yeasts (*Candida tropicalis* and *C. glabrata*) from different rivers of Basrah / Iraq . and identified by old and new methods and calcified by the following sources:-
(McGinnis, 1980; Ellis,1994; Guarro & Hoogde, 1995; Sullivan,et.al.,1998 and Kurtzman & Fell, 1999)
2- Resistance test yeasts of heavy metals :- measured resistance of some species of yeasts on growth in different concentrations of some heavy metals by method Agar diffusion (Rujbanshi,2008; Al – Hejuje,2012). The concentrations as follows:-
To lead and cobalt metals as (15,20,25,30,35,45,55,65,75,85), but cadmium metal as (7,12,17,22,27,37,47,57,67,77).
3- Resistance test yeasts of oil compounds :- measured resistance of some species of yeasts on growth in different concentrations of some oil compounds by method Agar diffusion (Rujbanshi,2008; Al – Hejuje,2012). The concentrations as follows:-
To Phenol as (0.1, 0.4, 0.7, 1, 4, 7, 10, 13, 16, 19) , Naphthalene as (1, 4, 7, 10, 13, 16, 19, 22, 25, 28) and Biphenyle as (1, 4, 7, 10, 13, 16, 19, 22, 25, 28).

3-Results

1- Resistance the yeasts of heavy metals
Show through this test that of isolates (*Candida tropicalis* and *C. glabrata*) ,these are resistance of growth in all different concentrations of lead and cobalt metals ,note that the unity of concentration (mg/l). But isolate *C. glabrata* is not growth in concentration (85 mg/l). As it is shown in the table (1). As for concentrations of cadmium metal Which yeasts grew all as it is shown in the table (2).

Table (1) Resistance some the yeasts of different concentrations of lead and cobalt metals.

Co										Pb									species Con.mg/l
85	75	65	55	45	35	30	25	20	15	85	75	65	55	45	35	30	25	20	15	
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*C. tropicalis*
-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	*C. glabrata*

Table (1) Resistance some the yeasts of different concentrations of cadmium metal.

Cd										Species Con. Mg/l
77	67	57	47	37	27	22	17	12	7	
+	+	+	+	+	+	+	+	+	+	*C. tropicalis*
+	+	+	+	+	+	+	+	+	+	*C. glabrata*

2- Resistant yeasts for certain derivative compounds of oil
Show through this test that of isolates (*Candida tropicalis* and *C. glabrata*) ,these are resistance of growth in all different concentrations of derivative compounds of oil The results were positive for all concentrations and both compounds are described as the following tables:-

Table (3) Resistance of some yeasts of some concentration to phenol

19	16	13	10	7	4	1	0.7	0.4	0.1	Con. Mg/l
										Species
+	+	+	+	+	+	+	+	+	+	*C. tropicalis*
+	+	+	+	+	+	+	+	+	+	*C. glabrata*

Table (4) Resistance of some yeasts of some concentration to naphthalene

28	25	22	19	16	13	10	7	4	1	Con.mg/l
										species
+	+	+	+	+	+	+	+	+	+	*C. tropicalis*
+	+	+	+	+	+	+	+	+	+	*C. glabrata*

Table (3) Resistance of some yeasts of some concentration to biphynel

28	25	22	19	16	13	10	7	4	1	Con.mg/l
										species
-	-	-	-	-	-	v.w	w	+	+	*C. tropicalis*
-	-	-	-	v.w	W	w	+	+	+	*C. glabrata*

* Note that the following labels represent test results:-
Labels (+) represent of thick growth.
Labels(-)represent of no growth.
Labels(w)represent of low growth.
Labels(v.w.)represent of very low growth.

4-Discussion

The water ecosystem is considered very important for bio organisms .So researches should be done to investigate the all aspects which altered these bio organisms . The physical and chemical factors have server effect on nature and distribution of organisms in that ecosystem .(Petihakis *et al*.,1999).

The technology of removing of pollutants such as ion exchange , chemical precipitation and filtration are economically expensive and harmful for ecosystem . So finding a methods with less expensive and lass harmful effect will help is such process . One of these methods is using microbes in removing the heavy metals from water ecosystem . (Rise – Robert, 1998; Stadler *et al*.,2004 and Rehman *et al*.,2007).

The microorganisms used in this technology are bacteria , molds , yeasts and algae .(Hansen *et al*.,1984 and Utigikar *et al*.,2000).

Waste water is rich with heavy metals and also contain many microbial strains which can resist such server condition by changing the metabolic pathways .(Shi *et al*.,2002). Our study prove the action of yeast in removing heavy metals at certain concentration . This results agreed with those who find that *C. tropicalis* can

grow at different concentration of heavy metals reached to 2300µg/ml cupper . It was also found that this yeast can tolerate many concentrations of heavy metals such as Cd,Cr,Ni,Pb and Hg for the concentration 120mg/ml, 1200µg/ml, 2000µg/ml, 2400µg/ml, 2800µg/ml and 3000µg/m receptivity.(Abe *et al*.,2001).

In addition tolerance of microbes to hydro carbonic material such as phenol and naphthalene of can grow in marine water with 1000- 1500 mg/ml phenol and naphthalene of yeast are on of these organisms (Farag and Soliman,2011).

Kaszycki, *et al*.,(2006) mentioned that Trichosporon can grow on media containing phenol and desel and this agreed with our results.

5-References

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