

## ISOLATION AND DIAGNOSIS SOME OF FUNGI FROM THE EUPHRATES RIVER IN THE CITY OF NASIRIYAH IN SOUTHERN IRAQ AND MEASURING SOME OF THE ENVIRONMENTAL CHARACTERISTICS OF THE SAME RIVER

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### **Abstract:**

This study carried out in “Nassiryia city” located in the southern of Iraq to isolate some fungi . Mycological samples were collected in January 2018 from water . Fungi isolated from sewage water of the city . It was isolated and diagnosed from the various regions in Naasyriha governorate, fungi found in the Euphrates River include the regions: The first station: - The city center near the olive bridge. The second station: - Sewage station near Al- Sedinaouia. The third station: - After the pumping station near the station Sedinaouia . These genus of fungi were identified by depend on based “phenotypic ,microscopicand the growth of fungi on media culture PDA and SDA .The present study using direct isolation method the following fungi have been isolated: Pythium, Aspergillus, Rhizoctonia, Alternaria, Penicillium Mucor, The current study showed that most of the fungi isolated by direct isolation due to the group of fungi deficient Deutromycetes and ovarian, this is due to the ability of these fungi to produce breeding units in large numbers and small size of those units And their ability to spread long distances up to hundreds of kilometers as well as the composition of structures that pass the environmental conditions not suitable for their growth , This has led to an increase in their numbers. Some environmental determinants such as temperature, pH, salinity and electrical conductivity have also been measured . The result revealed a clear balance between the temperature of water and air in the stations studied. the lowest rate of air temperature was (21°) in the first station and the maximum value was (25°) in the third stasion. While the water was above the value of (24°) in the first station, and the maximum rate of water temperature was (27°) in the third station. Furthermore, the PH was values tended to base. It is reached the highest value (8.3) in the third station, and the lowest value (7.36) in the second station . Also, there was change in the value of salinity and electrical conductivity for station in the study.

**Keywords:** isolate some fungi ;trace element ions; Physical and chemical measurements

## Introduction

Water is an important resource for all living beings, there is no life without water<sup>[1]</sup>, fresh water plays a key role in human life because it is the most suitable water source for its needs<sup>[2]</sup>. Sources of water pollution vary, including micro-pollution represented by sewage waste or untreated sewage, which causes many dissolved organic matter, suspended matter and micro-organisms harmful to organisms<sup>[3]</sup>. The fungi are one of the most important sources of water pollution that may be the source of soil, several studies have been conducted to detect the presence of fungi in the water, Muhsin and his group<sup>[4]</sup>. In Iraq, several studies have been conducted on isolation of aquatic fungi from river water and their relationship to aquatic organisms<sup>[5;6;7]</sup>. The physical and chemical properties of water have a role in influencing the organisms in these waters. Heat plays a role in the chemical reactions of the aquatic environment through its effect on the metabolism of water and its ability to compete with each other<sup>[8]</sup>. These qualities are also adopted as a criterion for assessing water quality and thus determining their suitability for different uses<sup>[9]</sup>. And found that the temperature effects on the components of water through their influence on taste, smell, melting gases and other<sup>[10]</sup>. Connectivity is an important factor because it gives an indication of the concentration of soluble salts in raw water and wastewater<sup>[11]</sup>. PH is a factor in aquatic life because most metabolic events depend on pH<sup>[12]</sup> and the solubility of elements in the water depends on the pH, as most of the elements remain in a soluble state at low pH. In the case of increasing pH, carbonates and then oxides and hydroxides form these elements, which can settle in the bottom as insoluble deposits<sup>[13]</sup>. The research aims to study the pollution of the Euphrates River from the physical, chemical and biochemistry point of view. It is also prepared as a few minutes of heavy metals, inorganic materials such as lead, copper, zinc and cadmium, are dangerous pollutants to the aquatic environment, these particulates are liquid or solid. Where they increase day after day and are highly toxic and highly damaging to tissues of living organisms<sup>[14]</sup>. Heavy metals are among the most dangerous of these contaminants because they do not decompose to the simplest and can accumulate within the tissues of the organism through their passage through the food chain<sup>[15]</sup>. It is also one of the most dangerous materials brought to the water from various agricultural and industrial sources.

## Materials and methods of work

Two media PDA and SDA were used to growth, isolate and diagnose fungi from sites studied in City Of Nassiyrah (water). Using cultivars

from PDA media and cultivars from SDA media to purification the fungi that growth and diagnosed it.

The study was conducted in the following regions (Stations):

Stations:

- 1- The first station: - The city center near the olive bridge
- 2- The second station: - Sewage station near Al- Sedinaouia

3 - The third station: - After the pumping station near the station Sedinaouia .

Samples were collected from, Euphrates river in City of Nassyria and the waters samples were put into 100ml capacity plastic bottles. The bottles were opened under water surface and they were closed before pulling out of water. The samples were put in a refrigerator till time of test.

In the isolation method, one ml water from the water sample were taken and put into sterilized petri dish (9 cm diameter using three replicates for each sample), then 20 ml of sterilized PDA media having the antibiotic (chloramphenicol, 250 mg l-1 concentration) was added to each petri dish. The petri dishes were circle shaken for contents homogenization, then the petri dishes were incubated at  $25 \pm 2$  Co for (4-7) days. The fungal colonies were estimated and purified.

## Physical and chemical measurements

### 1- Temperature

The temperature of the air and water was measured directly in the sample sites using the normal temperature range from 0-10 m. The temperature of the air is measured first in the shade. The temperature of the water is measured after immersion in water (AM) for 5 minutes, and repeated the process several times to confirm reading.

### 2- pH

The pH of the water was measured using the pH meter (HI8424), manufactured by HANA, after calibration with standard buffer solutions pH( 4,7,9) before operation.

### 3- Electrical Conductivity and Salinity

The electrical conductivity of the water samples was measured using the EC-meter EC-Meter produced by HANA Model (EC-215) and expressed by the output of the micromenzyme / cm<sup>3</sup>. In terms of the results of the electrical conductivity, the salinity values in the samples were calculated according to the equation : $\% \text{Salinity} = \text{EC} * 640 * 10^{-6}$ .

## Extract trace elements:

### Extract trace elements in water:

The method<sup>[16]</sup> was used as water samples (5)L were filtered using a glass filtration unit and a vacuum pump with a diameter of 0.45 microns balanced and dried at 60 °C after being soaked with nitric acid (0.5) (Ion exchange column 50 \* 2.5 cm) containing a Chelex-100 resin in the form of sodium (Sodium Form) size (50-100 mm) at a flow velocity not exceeding 5mm/min. Then rinsing the resin with 50mL of nitric acid (2) caliber and add 10 mL of ions free of water to the column, and then collect the solution passing through the column and a broom at 70 °C. (1-2mL) of concentrated nitric acid and 5-10 mL of ion - free

water for the purpose of complete dissolving and then complete the final volume to 25 mL with ions - free water. Clean and sealed plastic bottles have the size mentioned until the measurement of atomic absorption spectrometer at the Environmental Research Center/ University of Technology (Baghdad –Iraq).

### Measurement of trace element ions:

The trace ion elements were measured in the studied samples using the Flame Atomic Absorption Spectrophotometer. Cadmium, nickel and lead elements were measured. The special bulbs were used for each Hollow Cathod Lamp. Standard solutions were also prepared for the elements are examined from Stock Solutions<sup>[13]</sup>.

### Result

The results shows the highest rate of *Aspergillus* ,*Alternaria* isolated from water of the city.

Table (1) shows the fungi diagnosed in the middle (SDA) of each station .

The station	Species Fungi
St.1	<i>Aspergillus,Aspergillus nigar</i>
St. 2	<i>Mucor circinelloides</i>
St. 3	<i>Aspergillus ,Alternaria</i>

Table (2) shows the fungi diagnosed in the middle (PDA)of each station .

The station	Species Fungi
St.1	<i>Alternaria,Epicoccum,Fumago,Noranus,Pithomyces,Uloclodium</i>
St. 2	<i>Mucor,Penicillium</i>
St. 3	<i>Alternaria</i>

**Table (3) shows the environmental characteristics of the Euphrates River**

The environmental characteristics	St.1	St.2	St. 3
Tem w	24	26	27
Tem A	21	23	25
PH	8.1	7.36	8.3
Nacl	3.8	5.3	3.9
TDS	983 ppm	1343 ppm	1007 ppm
E .C.	1911 ms	2686ms	2015ms
pb	8.73	16.5	9.75
Cd	0.1	0.17	0.091

## Discussion

Heat is an important environmental characteristic affecting various biological processes for their direct effect on enzymatic processes and the melting of gases and salts in water. And that high temperature has a negative impact on the preparation of fungus aquatic and this is due to the impact of the process of production and spread of spores propagation of fungus changes that get the temperature<sup>[17]</sup>. The degree of pH tends to light basal because of the abundance of carbonate ion and bicarbonate, and also show that the rates are lower in the winter and increase during the summer because of the activity of hydropods, The pH levels are relatively high in the Euphrates River due to the addition of organic matter to the river, which is the carbon dioxide and hydrogen sulfide gases that have the effect of changing the pH range. Which makes this factor deviates from its optimal value for the growth of water fungus, which makes this factor to a large extent in the presence of these fungi, this is consistent with his findings<sup>[18]</sup>Salinity results were similar to conductivity and were high due to large additions of water of spills

in the area . It is known that some of the fungus has the ability to tolerate salinity, As their vegetative structures are more tolerant of salinity than their sexual and sexual reproduction structures when they are found in water systems with heterogeneous salinity, however, fungi can reproduce grow and form colonies in different climatic conditions. The results showed that *Pythium* and *Aspergillus* species are the most

present and may be due to the presence of these fungi significantly during the study period because of the fungus of soil transmitted during watering.

As confirmed by many studies that indicated the presence of soil fungi in water sources<sup>[19;20]</sup>. The results showed that most of the fungi isolated by direct isolation due to the group of fungi deficient Deutromycetes and ovarian, this is due to the ability of these fungi to produce breeding units in large numbers and small size of those units, and its ability to spread long distances up to hundreds of kilometers as well as the composition of the structures pass through the environmental conditions is not suitable for its growth, which led to an increase in numbers and this is consistent with <sup>[21]</sup>, as for the fungal fungi have been isolated *Mucor*, and that these fungi are mostly marshmallows grow in the soil of the river banks and are applied to organic matter located in the soil and part of which settles plant residues and leaves falling, most likely they are present in the studied environment in the form of breeding structures resistant to inappropriate conditions transmitted by wind and rain from the terrestrial environment to the aquatic environment and this explains why it is isolated from water.

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