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A STUDY OF CONTAMINATION CRITERIA OF SURFACE WATERS OF AL-NAJAF SEA\SOUTH OF IRAQ

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ABSTRACT

The results showed that four months for the area being affected by the prevailing climate in the central region of the country, which is cold in winter and hot and dry in summer. The highest temperatures were recorded in July, while the lowest was in February. The reason for the high pH values in all months, especially July was because of the abundance of water plants and the increase in photosynthesis activity, especially when the temperature rises. The results showed that there were significant differences between the months of the value of dissolved oxygen, as the highest value of dissolved oxygen was in February and the lowest value in July, due to the increase in rain in the winter, the lack of activity of the decomposing organisms, and poor water retention of oxygen at high temperatures. The results showed that there were significant differences in concentrations of ions of mineral elements between months and their absence between stations, where the results showed a rise in concentrations of ions of mineral elements in hot months (July and June), while they decreased in the cold months (February and March) where the highest concentration was in July and the lowest concentration in February, the reason is due to the increase in the activity of the analyzed organisms and the increase in the process of evaporation of water in hot months. The results showed the isolation of seven genera of fungi from the four study stations, where the fungus *Alternaria* sp was the most common fungi by 33%, followed by *Aspergillus flavus* by 30%, then the fungus *Aspergillus niger* by 28%, while the fungus *Penicillium citrinum* accounted for 17%, while it was *Saprolegnia* increased by 10%, followed by *Trichoderma reesei* by 7%, while *Pythium* sp formed 4%, while *Cryptococcus albidus* ranked last in isolation rate which was 2%.

KEY WORD : Physical and Chemical properties, Pollution, Fungi, Najaf sea

INTRODUCTION

There is importance to conduct comprehensive checks of Iraqi water to fill gaps in information and indicate the possibility of benefiting from water for different uses. In addition to identifying the pollutants that are exposed to the waters of the Al-Najaf sea to find the ideal solutions to treat them.

About 400 species of water fungi have been described, including six genera and more species of basidiomycetes and 170 genera and more species of ascomycetes (Al-Kenzawi, 2007). The remainder of the water fungi are chytrids and mitosporic or that asexual fungi (Al-Saadi, 1996). Many species of water fungi are known only of spores and it was likely that large number of more species have yet to be discovered (Al-Nimma, 1982).

MATERIALS AND METHODS

Several tests were carried out at three stations in the morning, mid-month and four months (February, March, May and July). Where samples were taken from a depth of 10-15 cm with 1 liter containers, where the temperature, pH and dissolved oxygen were measured by a multiphotometer, and turbid by the Turbometer, and the equipment was calibrated both laboratory and field before performing the tests. The ions of the mineral elements (K, Na, Mg, Ca) were also measured by the methods described

(Kinghorn, 1983). The results of physical and chemical measurements were treated with statistical relationships in order to reach clear conclusions under the level of significance 0.05 between the averages**.**

RESULTS AND DISCUSSION

The result showed that waters of Al-Najaf Sea for a period of four months (February, March, May, July) 2019**.**

As the increase was observed for station 4 followed by 3 compared with 1 and 2 stations,where the lowest values were in station 1, In most of the measured criteria. The results showed that there were significant differences between the four months and not between stations. This is due to the study area being affected by the prevailing climate in the central region of the country, which is cold in winter and hot dry in summer (Al-Fartusi, 2007). The highest temperatures were recorded in July, while the lowest was in February. The reason for the high pH values in all months, especially July, is because of the abundance of water plants and the increase in photosynthesis activity, especially in when the temperature rises (APHA, 2003). The results showed that there were significant differences between the months of the value of dissolved oxygen, as the highest value of dissolved oxygen was in February and the lowest value in July, due to the increase in rain in the winter (Indra *et al*., 2005), the lack of activity of the decomposing organisms, and poor water retention of oxygen at high temperatures (Kumar *et al.,* 1992). The results showed that there were significant differences in concentrations of ions of mineral elements between

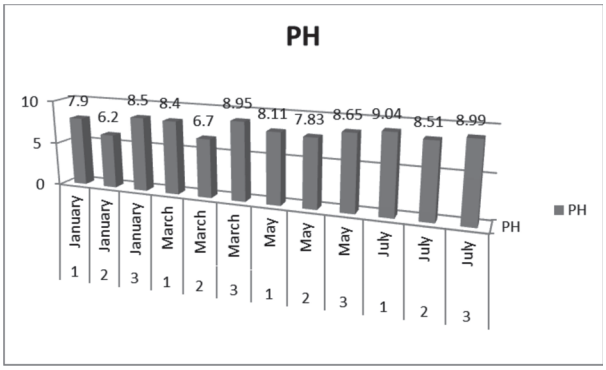

Fig. 1. Monthly changes to the rates of pH levels for the waters of Al-Najaf Sea

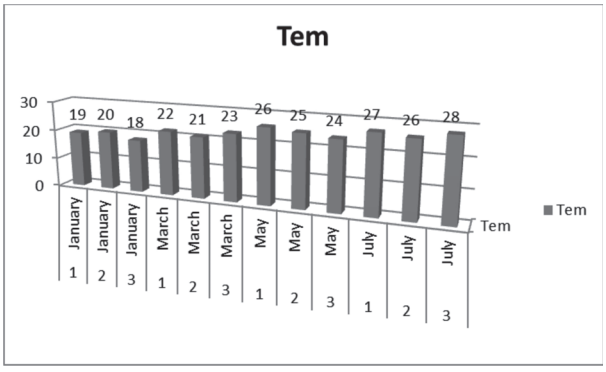

Fig. 2. Monthly changes to the rates of temperature levels for the waters of Al-Najaf Sea .

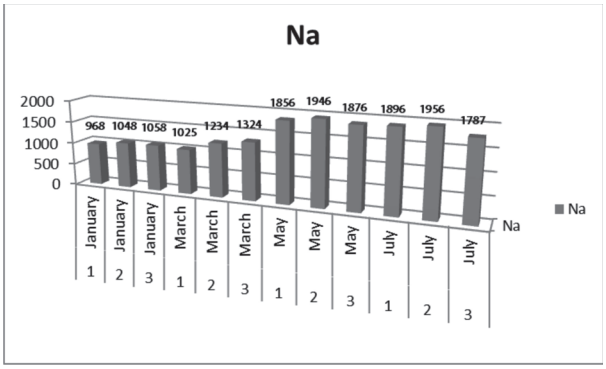

Fig. 3. Monthly changes to the rates of Na levels for the waters of Al-Najaf Sea

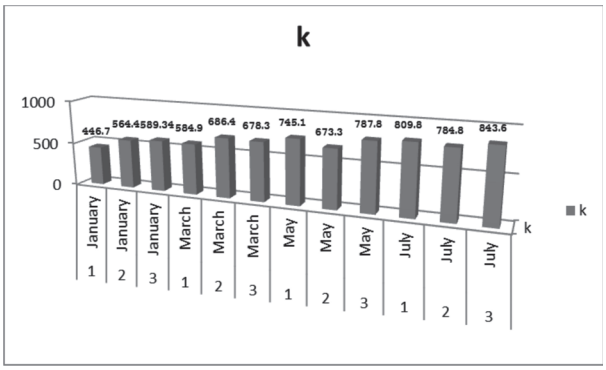

Fig. 4. Monthly changes to the rates of K levels for the waters of Al-Najaf Sea

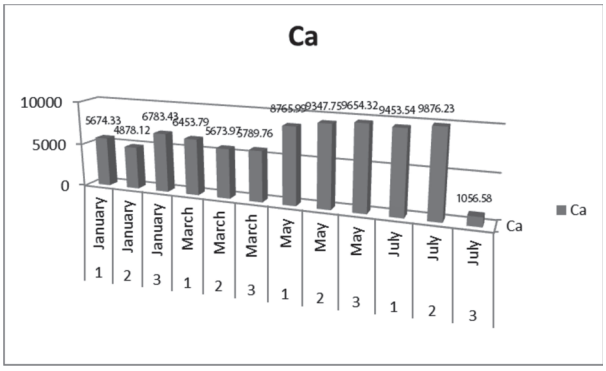

Fig. 5. Monthly changes to the rates of Ca levels for the waters of Al-Najaf Sea

months and their absence between stations, where the results showed a rise in concentrations of ions of mineral elements in hot months (July and June), while they decreased in the cold months (February and March) where the highest concentration was in July and the lowest concentration In February, the reason is due to the increase in the activity of the analyzed organisms and the increase in the process of evaporation of water in hot months (AL-lami, 1996).

The results showed the isolation of seven genera of fungi from the four study stations, where the fungus *Alternaria* sp was the most common fungi by 33%, followed by *Aspergillus flavus* by 30%, then the fungus *Aspergillus niger* by 28%, while the fungus *Penicillium citrinum* accounted for 17%, while it was *Saprolegnia* increased by 10%, followed by *Trichoderma reesei* by 7%, while *Pythium*sp formed 4%, while *Cryptococcus albidus* ranked last in isolation rate which was 2%.

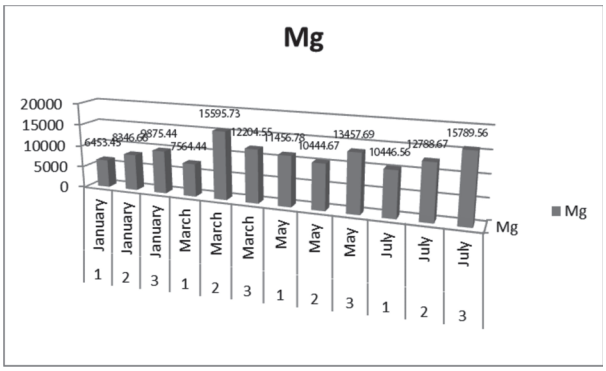

Fig. 6. Monthly changes to the rates of Mg levels for the waters of Al-Najaf Sea

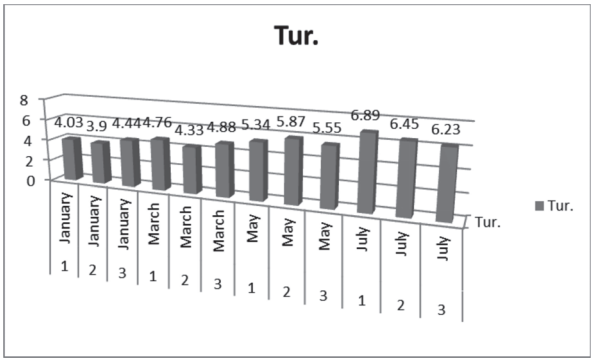

Fig. 7. Monthly changes to the rates of Turbidity levels for the waters of Al-Najaf Sea

Table 1. Monthly changes to the rates of physical and chemical evidence for the waters of Al-Najaf Sea

Station	Month	PH	Tem	Na	k	Ca	Mg	Tur.	D.O.
1	January	7.90	19	968	446.7	5674.33	6453.45	4.03	5.45
2		6.20	20	1048	564.4	4878.12	8346.66	3.90	4.99
3		8.50	18	1058	589.34	6783.43	9875.44	4.44	5.89
1	March	8.40	22	1025	584.9	6453.79	7564.44	4.76	3.56
2		6.70	21	1234	686.4	5673.97	15595.73	4.33	3.76
3		8.95	23	1324	678.3	5789.76	12204.55	4.88	3.67
1	May	8.11	26	1856	745.1	8765.99	11456.78	5.34	2.59
2		7.83	25	1946	673.3	9347.75	10444.67	5.87	2.01
3		8.65	24	1876	787.8	9654.32	13457.69	5.55	2.34
1	July	9.04	27	1896	809.8	9453.54	10446.56	6.89	2.05
2		8.51	26	1956	784.8	9876.23	12788.67	6.45	2.04
3		8.99	28	1787	843.6	1056.58	15789.56	6.23	1.89
L.S.D	1.78	0.56	2.48	3.67	2.89	4.66	0.38	0.56	

Table 2. Monthly changes to repetition rates ofisolated fungi for the waters of Al-Najaf Sea

No.	Isolated Fungi	Months				Rate of Repetition	L.S.D.
		January	March	May	July		
1	*Alternaria sp.*	25	35	38	34	33	0.6
2	*Aspergillus flavus*	24	32	34	30	30	1.2
3	*Aspergillus niger*	20	32	32	28	28	0.9
4	*Penicilliumcitrinum*	10	19	21	18	17	0.8
5	*Saprolegnia*	6	11	13	10	10	0.6
6	*Trichoderma reesei*	3	8	10	7	7	0.8
7	*Pythium sp*	1	5	6	4	4	0.5
8	*Cryptococcus albidus*	0	1	5	2	2	0.3

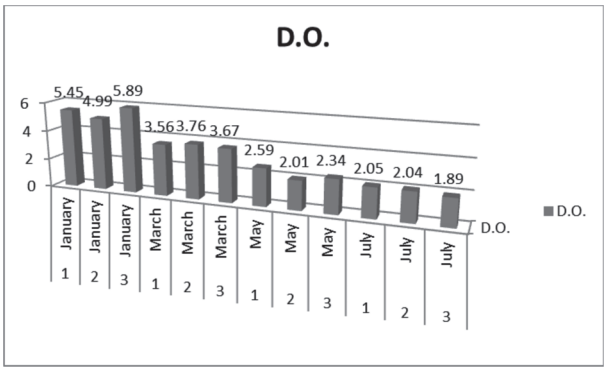

Fig. 8. Monthly changes to the rates of Dissolved oxygen levels for the waters of Al-Najaf Sea

The result showed that some species of fungi could thrive at certain levels on some physicochemical parameters, but others showed sensitivity of some parameters at these levels (Al-Rekabi *et al.,* 1989). The environmental requirements from different species differ, which that hence defining their respond to variations from these factors (APHA, 1999). In addition most parameters analyzed, it that showed specific temporary or spatial variation (Hussein *et al.,* 2007). Temperatures have an effect on the distribution of fungi (Al-Rekabi *et al.,* 1990). Fungi are living organisms that tend to have pH, but it is noticed that they have a wide range of pH located between (3-10) (Aftab *et al.,* 2005). The effect of mineral elements and their salts is negative in the growth of most types of fungi, while there are some genera and types of them that bear the increase in the percentage of salts (Steciow *et al.,* 1997). It were tend to be moderately exposed to salts in order to thrive in their growth (Furati *et al.,* 2004). Micro-organisms tend to grow in regions with moderate growth standards while some resist high growth standards and are considered as pollution criteria inwater (Ali, 2008).

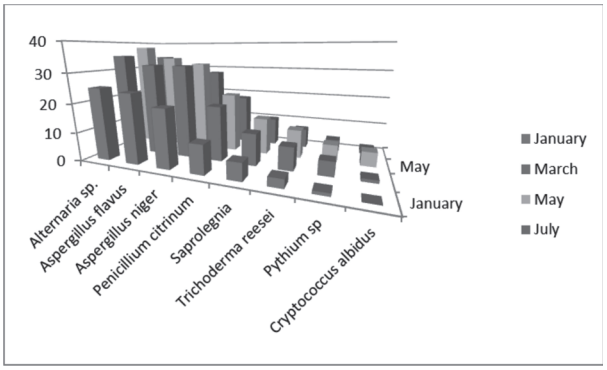

Fig. 9. Monthly changes to repetition rates of isolated fungi from the waters of Al-Najaf Sea

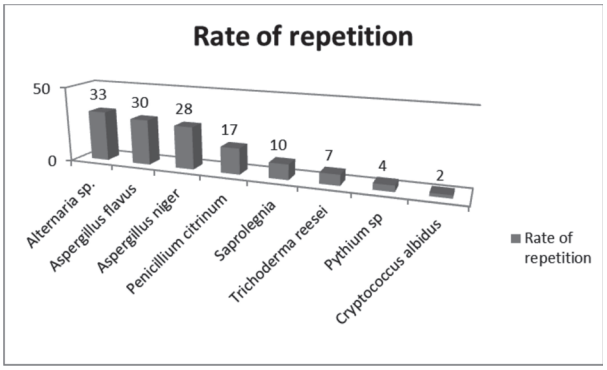

Fig. 10. Repetition rates of isolated fungi from the waters of Al-Najaf Sea

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