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PHYSIO-CHEMICAL ANALYSIS OF SAMPLES OF SOIL SELECTED FROM DIFFERENT AGRICULTURE AREAS FROM AL-NAJAF

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ABSTRACT

The twelve samples of agricultural soils from four regions in Al-Najaf governorate with sampling plant with soil. Physical properties of the soil where studied, such as electrical conductivity ranged from (136.33-1070.00)µS/cm^{-3}, and moisture which ranged between the values (0.39-36.48)%. The chemical analysis of the soil have included the proportion of calcium carbonate the ratio between (44.00-48.00%) has been observed increasing amounts of calcium carbonate in surface models. The pH where results indicate that pH values were close to study models ranged between (6.88-7.42) these values generally within the normal range for the measured pH values of the Iraqi soil. The amount of gypsum ranged between the (1.36-4.32meq/100g) proportion of organic matter in the soils studied models was high compared with the percentage of which is supposed to good soils for plant growth and the extent of the proportion of organic matter between (3.31-30.22%). As well as the estimation of heavy metals in the soil, samples were arranging as follows: (Fe> Cr>Mn> Zn>Pb> Cu> Cd). As arranged in the plant as follows: Fe>Mn>Pb> Zn> Cr> Cu> Cd.

KEY WORDS: Soil, pollution, electrical conductivity, Moister.

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التحاليل الفيزيائية الكيميائية لنماذج تربة مختارة من مناطق زراعية في محافظة النجف الاشرف

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الخلاصة

جمع اثنى عشر انموذج زراعي من اربع مناطق مختلفة في محافظه النجف، وجرى دراسة الخصائص الفيزيائية للتربة مثل التوصيلية الكهربائية التي تراوحت قيمها بين 136.33-1070.00 $\mu S/cm^{-3}$ والرطوبة التي كانت قيمها ضمن المدى 0.39-36.48%، اما التحاليل الكيميائية للتربة فقد تضمنت نسبة كاربونات الكالسيوم التي كانت تتراوح بين 44.00-48.00% حيث لوحظ ان النماذج لسطح التربة اعطت نسب اعلى لكاربونات الكالسيوم، اما قياسات الاس الهيدروجيني فقد كانت بالمدى 6.88-7.42 وهي قريبه من القيم المسجلة للدراسات السابقة للتربة العراقية، وكانت كمية الجبس بالمدى 1.36-4.32 meq/100g، اما نسبة المادة العضوية فقد كانت بالمدى 3.31-30.22% وهي عاليه مقارنه بالنسب المسجله للتربة الصالحة لنمو النباتات، في حين تم تقدير العناصر الثقيله فقط وفق تقنية الامتصاص الذري وكانت كمياتها في نماذج التربة بالترتيب (Fe>Cr>Mn>Zn>Pb>Cu>Cd) اما في نماذج النبات فقد كانت بالترتيب (Fe>Mn>Pb>Zn>Cr>Cu>Cd)

الكلمات المفتاحية: التربة، التلوث، التوصيلية الكهربائية، الرطوبة.

INTRODUCTION

Some selected physicochemical parameters in soil samples collected from four agricultural areas of East Gojjam Zone, Ethiopia were studied. The soil characterization was carried out for parameters like moisture content, pH, electrical conductivity, organic carbon, organic matter, cation exchange capacity, potassium, sodium, calcium and magnesium **(Wodaje 2015)**. The physico-chemical properties of soils in some vegetable farms around Sokoto metropolis were studied with the objective of assessing the level of the physico-chemical properties as well as the differences among different locations and depths. Girabshi and KofarKware areas of vegetable crop production were randomly selected in the metropolis **(Jabir 2012)**. Study and compare the physio-chemical properties of two different districts of Khyber Pakhtunkhwa, Pakistan (Peshawar and Swabi). Ten soil samples from each district were collected at a depth of 10-15 cm from the selected sites and were analyzed for the different physical and chemical parameters **(Irum 2017)**. Five pits representing a pedon each were opened and profile in each pit was described for its morphological, physical and chemical characteristics according to standard procedures. A total of 20 disturbed soil samples and 16 core ring samples were collected from five representative profiles **(Alemu 2019)**. Study the effect of phosphate and urea fertilizers on the physicochemical properties, pH and electrical conductivity of the soil. The effect of these fertilizers on cation exchange capacity, organic matter, and the possibility of contamination with heavy metals (Cr, Cu, Cd, Mn, Zn, Ni, Fe, and Pb) on the soils of Alshati agricultural project at different seasons after forty years of fertilization **(Mansour 2020)**. Physicochemical study of soil is based on various parameters like total Organic Carbon, Nitrogen, Phosphorus (P_2O_5), Potassium (K_2O), pH and conductivity. Results show that all the eight selected places of Bhusawal have medium or high minerals content **(Kiran 2013)**. The contamination of plants grown with heavy metals in part of Diyala River, soil, plants in agricultural lands located on the both side of the Diyala River and irrigated from this river, 12 samples of irrigation water, 12 samples of soil and another 12 samples of plants like celery, radish. malt and clovers were taken and analyzed to find the concentration of some heavy metals Pb, Zn, Ni, Cd, Cr, Mn, and Cu **(Ghufran 2010)**.

MATERIALS AND METHODS

Sample storage (Mottle 2007; Seifi 2010)

Samples should be stored in closed plastic bags and refrigerated at 4°C until analysis.

Procedures (Mottle 2007; Seifi 2010)

Moisture content (Mottle 2007; Seifi 2010)

Take 10gm of soil and drying at 110±5°C to constant weight (usually 24-48 hr). Then, calculate the weight of dry soil, as follow equation:

$$\text{Moisture content (\%)} = \frac{\text{wet wt of soil (gm)} - \text{dry wt of soil (gm)} \times 100}{\text{dry wt of soil (gm)5}} \ldots\ldots\ldots\ldots (1)$$

$$\text{Moisture coeiffeint} = \frac{100 + \%_{\text{Moist}}}{100} \ldots\ldots\ldots\ldots (2)$$

pH (Mottle 2007; Seifi 2010)

pH of soil should be measured on field moist soil. pH measurements in soil at a 1:2 ratio with 0.01M $CaCl_2$.

Conductivity (Mottle 2007; Seifi 2010)

Prepare a 1:1 (soil:water) suspension, and using conductivity cell for measuring the conductivity.

Calcium carbonate (Mottle, 2007; Seifi, 2010)

1 gm air-dry soil and add 10 mL 1 N HCl solution. Next, heat to 50-60°C. Then, add 50-100 mL DI water, and add 2-3 drops phenolphthalein. Finally, titrate with 1 N NaOH solution.

$$1mL\ of\ 1N\ HCl = 0.05g\ CaCO_3 \quad \ldots\ldots\ldots\ldots (3)$$

$$Grams\ CaCO_3 \times 100 = \%\ CaCO_3\ equivalent \quad \ldots\ldots\ldots\ldots\ldots (4)$$

Organic matter (Mottle, 2007; Seifi, 2010)

Add to 1 gm air-dry soil 10 mL 1 N $K_2Cr_2O_7$ solution and 20 mL concentrated sulfuric acid. Allow the mix to stand for 30 min. Next, add about 200 mL DI water, then add 10 mL concentrated orthophosphoric acid, and allow the mixture to cool. Add 10-15 drops diphenylamine indicator. Titrate the mix with 0.5 M ferrous ammonium sulfate solution, until the color changes from violet-blue to green.

$$M = \frac{10}{V_{blank}} \quad \ldots\ldots\ldots (5)$$

$$\%\ Oxidizable\ Organic\ Carbon\ (w/w) = \frac{[V_{blank} - V_{sample}] \times 0.3 \times M}{Wt} \quad \ldots\ldots\ldots (6)$$

$$\%\ Total\ Organic\ Carbon(w/w) = 1.334 \times \%Oxidizable\ Organic\ Carbon \quad \ldots\ldots\ldots (7)$$

$$\%\ Organic\ Matter(w/w) = 1.724 \times \%Total\ Organic\ Carbon \quad \ldots\ldots\ldots (8)$$

M= Molarity of ferrous ammonium sulfate solution (approx. 0.5M), $\mathbf{V_{blank}}$=Volume of ferrous ammonium sulfate solution required to titrate the blank (mL) , $\mathbf{V_{sample}}$= Volume of ferrous ammonium sulfate solution required to titrate the sample (mL), **Wt**= Weight of air-dry soil (gm),**0.3**=$3\times10^{-3} \times 100$, where 3 is the equivalent weight of C.

Organic carbon (Mottle, 2007; Seifi, 2010)

Fill the crucible ½ to ¾ full with field moist soil. Place the crucible in the drying oven and dry at 105°C overnight. Place the crucible in a muffle furnace and heat at 420°C for 1.5 hr.

$$\text{LOI\% at 420°C} = \frac{\text{wt after oven dry 105°C} - \text{wt after ignition 420°C} \times 100}{\text{Wt after oven dry 105°C}} \quad \ldots\ldots\ldots (9)$$

Place crucibles in a muffle furnace and bring the temperature up to 850°C and heat for 0.5 hr after reaching temperature. Calculate loss on ignition at 850°C as follows:

$$\text{LOI\% at 850°C} = \frac{\text{wt after oven dry 105°C} - \text{wt after ignition 850°C} \times 100}{\text{Wt after oven dry 105°C}} \quad \ldots\ldots\ldots (10)$$

Gypsum (Mottle, 2007; Seifi, 2010)

Weigh 10 to 20 gm air-dry soil into a 250 mL bottle, and add a measured volume of DI water sufficient to dissolve the gypsum present. Shake the bottle by hand six times at 15 min. Filter the extract through filter paper. Add 20 mL acetone, mix well. Centrifuge at 4000 rpm for 3 min. Measure electrical conductivity of the solution, and correct conductivity reading to 25°C. Determine gypsum concentration in the solution by reference to a calibration curve (Figure 1) of the following data:

$$CaSO_4.H_2O_{\ in\ aliquot\ (meq)} = CaSO_4.H_2O_{\ from\ conductivity\ reading\ (meq/L)} \times water_{\ used\ to\ dissolve\ precipitate\ (mL)}/1000 \ldots\ldots (11)$$

$$Gypsum_{\ (meq/100gm)} = 100\times CaSO_4.H_2O_{\ in\ aliquot\ (meq)}/(Soil:water)_{ratio} \times (soil\text{-}water)_{\ extracted\ used(mL)} \ldots\ldots (12)$$

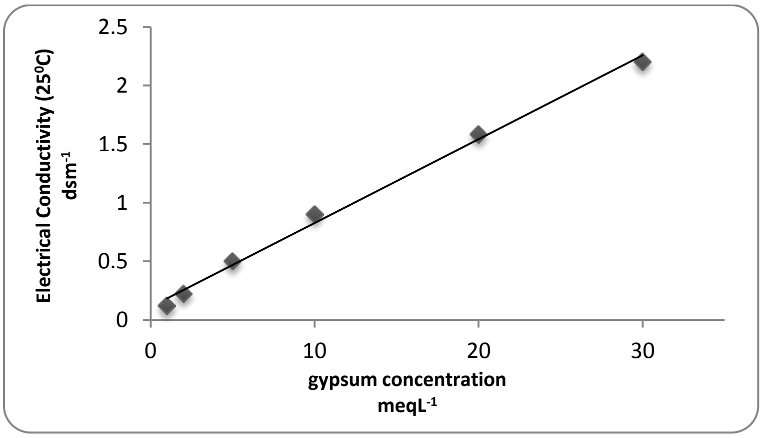

Figure (1): Calibration curve of gypsum.

Metals (Carter & Gregorich 2008)

Heavy metals analysis was done by atomic absorption spectrometry, the samples was treated by acid digestion method by taken (1 gm of soil (or plant) sample was digested with 10 mL of HNO_3, 2 mL of H_2O_2 and heated on a hot plate).

RESULTS AND DISCUSSION

The results in (Table 1) show the highest value in agricultural soil from Al-Mishkhab, its values ranged between (527-1070 μSm.cm^{-3}), the soil from Al-Buhidarihave (194-697.66 μSm.cm^{-3}). Al-Abbassiyaarea has recorded soil away from the Euphrates river values higher than the soil near the Euphrates River, where soil EC far from the Euphrates River in the range (136.33-249.66 μSm.cm^{-3}). While the values of the soil near the Euphrates River ranged (178.16-189.60 μSm.cm^{-3}), electrical conductivity of a soil solution give a perception of the inorganic soluble salt concentration, it is an important indicator of soil health. That the value of the salinity of agricultural soils under study is very high salinity according to classified U.S. Salinity Laboratory U.S.D.A. to soil salinity **(Omanayi 2011)**.

The highest percentage of moisture to agricultural soil in the area Al-Buhidari ranged value between (21.89-27.83%), followed by agricultural soil away from the Euphrates River, the moisture was (18.48-21.35%), while agricultural soils for the Al-Mishkhab recorded lower moisture between models studied were (0.39-2.75%). Calculated moisture coefficient values were greater than one for all models.

The content of soils study of calcium carbonate are shown in the (Table 1) as observed increasing amounts of calcium carbonate in surface models ranged between (44.00-48.00%). The high amounts of calcium carbonate in surface models of soils study attributed to the influence of the original limestone. That there is a relationship between temperature and percentage of calcium carbonate in the soil as it explained that the solubility rate increases in the winter with the availability of adequate amounts of moisture and less in summer. So may be caused by the high rate of calcium carbonate in the soils study, particularly among models surface due to the date of sampling, which was at the end of the summer as conditions are helping to increase evaporation from the soil surface, which helps movement of carbonate towards the top, and then increase in the calcification **(U.S.D.A. 1960)**.

Table (1): Physical properties of agriculture agrarian farm soils.

Sample Name	Sample No.	Depth	EC $\mu S/cm^{-3}$	(%) RSD	(%) Moister	M.C.F.	(%) RSD	(%) $CaCO_3$	(%) RSD
Al-Abbassiya near Euphrates river	1	Surface	181.60	18.32	36.48	1.36	0.43	47.00	16.66
	2	10cm	189.60	2.69	13.46	1.13	1.26	44.00	8.33
	3	20cm	178.16	7.033	12.61	1.12	0.67	47.50	20.00
Al-Abbassiya far Euphrates river	4	Surface	195.33	3.33	18.48	1.18	0.47	46.50	14.28
	5	10cm	136.33	24.64	21.35	1.21	0.97	46.50	14.28
	6	20cm	249.66	4.64	20.67	1.2	1.01	46.00	12.50
Al-Buhidari	7	Surface	462.00	2.83	21.89	1.21	0.017	48.50	33.33
	8	10cm	697.66	0.975	27.83	1.28	0.0018	46.00	12.51
	9	20cm	194.00	13.15	27.18	1.27	0.0017	46.50	14.28
Al-Mishkhab	10	Surface	527.00	4.85	0.39	1.004	0.862	45.00	10.00
	11	10cm	425.33	3.83	2.75	1.03	1.21	45.00	10.00
	12	20cm	1070.0	0.79	3.56	1.035	1.30	44.00	8.33
Average			375.55		17.22			46.04	

Different plants grow better in different pH values so farmers usually work to add materials that change the pH of the soil, depending on the type of plants to be grown. Also possible to be affected by the pH of the soil pH of the water or any other water source nearby, such as rivers or lakes. The results suggest that pH values (Table 2) was almost close to range between (6.88-7.42) these values are generally within the normal range of pH values measured in the Iraqi soil **(U.S.D.A. 1960)**.

The results showed in the (Table 2) that the highest value for gypsum was in agricultural soils far from the Euphrates river to Al-Abbassiyaand ranged between (2.56-3.60meq/100gm), followed by agricultural soil for Al-Buhidari and was (1.50-4.32 meq/100gm), either agricultural soil area Al-Mishkhab (1.36-3.36 meq/100gm). In addition, less the amount of gypsum appeared in agricultural soil near the Euphrates River to the Al-Abbassiyaand was (1.68-2.32 meq/100gm).

The results indicate that the percentage of organic matter soils agricultural under study ranged between values (3.31-30.22%), that are too high with what was approved by previous studies where indicated that good soil for the growth of most plants must contain 45% minerals (mix clay, sand, silt)-5% organic matter-25% air - 25% water **(Pettijhon 1959)**.

Table (2): Physical properties of agriculture agrarian farm soils.

Sample Name	*Sample No.*	*Depth*	*pH*	*(%) RSD*	*Gypsum meq/100gm*	*(%) RSD*	*(%) Oxidizable Organic carbon (w/w) (%) OOC*	*(%)Total Organic Carbon (w/w) (%)TOC*	*(%) Organic Mater (%)OM*	*(%) RSD*	*In Organic Carbon IOC*	*(%) RSD*
Al-Abbassiya near Euphrates river	*1*	*Surface*	6.88	1.81	1.76	0.46	10.8	14.4	24.83	0.42	3.65	0.27
	2	*10cm*	7.29	3.86	2.32	0.36	1.44	1.92	3.31	0.11	4.97	0.2
	3	*20cm*	7.14	5.34	1.68	0.49	7.2	9.6	16.55	0.21	3.7	0.27
Al-Abbassiya far Euphrates	*4*	*Surface*	7.24	4.67	3.36	0.24	10.08	13.44	23.18	0.35	1.19	0.84
	5	*10cm*	7.19	3.59	3.6	0.23	10.8	14.4	24.83	0.42	4.11	0.24
	6	*20cm*	7.03	7.98	2.56	0.32	6.12	8.16	14.07	0.18	3.94	0.25

river												
Al-Buhidari	*7*	*Surface*	7.2	3.47	3.28	0.25	13.14	17.53	30.22	1.19	2.01	0.5
	8	*10cm*	7.42	3.94	1.5	0.53	12.95	17.27	29.78	1.03	2.33	0.43
	9	*20cm*	7.33	3.02	4.32	0.19	12.56	16.76	28.9	0.82	1.9	0.52
Al-Mishkhab	*10*	*Surface*	7.09	0.81	2.48	0.32	11.04	14.73	25.39	0.45	0.48	2.08
	11	*10cm*	7.37	1.76	1.36	0.57	10.92	14.57	25.12	0.43	0.56	1.77
	12	*20cm*	7.19	3.85	3.36	0.25	12.6	16.8	28.98	0.83	0.42	2.41
Average			7.19		2.63		9.97	13.29	22.93		2.43	

The heavy elements of environmental pollutants hazardous and is dangerous in the described cumulative in the bodies of living organisms and the needs of humans and animals to a certain percentage of these elements that may get part of the plant through the food chain so the high concentrations of these elements in plants for allowable limits endanger the lives consumer risk. The increase in concentrations due to the growth of plants in soil contaminated with these elements, owing to factors weathering geological soil or as a result of excessive use of chemical fertilizers and pesticides and often be the result of irrigation water contaminated residues laboratories and factories and wastewater add to sewage.

(Table, 3) results estimate the heavy elements in soil samples have shown that the values of concentrations of heavy elements all of which are less than the permissible limits by the WHO. Iron record highest concentrations of the elements studied ranged between (2.404-39.672) ppm, followed by chromium and the extent of concentrations (6.624-24.749) ppm. Then comesa manganese concentrations ranged between (300-450) ppm. The zinc was recording over concentrations ranging between (4.378-7.806) ppm. The concentrations of lead ranging between (2.596-1.770) ppm. While the record low copper concentrations ranged between (5.411- 18.800) ppm. For cadmium concentrations were between (0.427- 1.898) ppm.

Table (3): Elements levels of agriculture agrarian farm soils.

Sample Name	***Sample No.***	***Depth***	***Cu ppm***	**(%) *RSD***	***Fe ppm***	**(%) *RSD***	***Cr ppm***	**(%) *RSD***	***Pb ppm***	**(%) *RSD***	***Zn ppm***	**(%) *RSD***	***Mn ppm***	**(%) *RSD***	***Cd ppm***	**(%) *RSD***
Al-Abbassiyanear Euphrates river	***1***	***Surface***	7.345	0.0063	39.427	0.080	7.020	0.009	1.965	0.033	6.130	0.2158	350	0.023	0.427	0.02
	2	***10cm***	7.266	0.0073	34.773	0.065	7.114	0.012	2.272	0.032	6.147	0.2152	300	0.025	0.528	0.0203
	3	***20cm***	6.873	0.0095	35.038	0.070	8.241	0.013	1.770	0.034	7.806	0.2285	360	0.026	0.524	0.0248
Al-Abbassiyafar Euphrates river	***4***	***Surface***	8.193	0.0082	2.404	0.039	8.127	0.011	1.879	0.034	5.257	0.2197	340	0.025	0.824	0.021
	5	***10cm***	6.321	0.0077	34.491	0.067	6.624	0.010	1.973	0.032	4.378	0.2201	350	0.023	0.934	0.0205
	6	***20cm***	5.411	0.0087	35.372	0.068	8.220	0.013	1.930	0.034	6.940	0.2269	350	0.028	0.827	0.0253
Al-Buhidari	***7***	***Surface***	18.802	0.0062	-	0.042	19.250	0.075	2.497	0.035	6.258	0.2295	325	0.025	1.898	0.0262
	8	***10cm***	12.008	0.0105	39.207	0.081	20.398	0.007	1.845	0.036	7.372	0.237	330	0.032	1.784	0.0297
	9	***20cm***	12.613	0.0099	39.672	0.083	24.749	0.007	1.913	0.035	6.795	0.2348	330	0.029	1.685	0.0295
Al-Mishkhab	***10***	***Surface***	12.218	0.0073	38.574	0.076	9.233	0.005	2.223	0.034	6.897	0.2441	440	0.025	1.791	0.0215
	11	***10cm***	10.22	0.0078	39.168	0.081	12.509	0.007	2.596	0.035	6.229	0.2427	445	0.027	1.623	0.0294
	12	***20cm***	5.715	0.0055	38.964	0.076	13.813	0.004	2.438	0.034	6.670	0.2318	450	0.022	1.609	0.0299
Average			9.415		34.281		12.108		2.109		6.407		364.1		1.204	
PL*			100		-		100		100		300		2000		3	

***PL: Permissible limits according to World health organization WHO (mg/L)**

The plant models (Table 4) showed a higher concentration of copper (11.332 ppm) in cress which taken from the Al-Mishkhab sub district and the lowest concentration of the bean plant was taken from the agricultural soil near the Euphrates river in Al-Abbassiya sub district. Iron record concentrations ranging between (1.409-36.678) ppm and chromium record concentrations ranged between (0.450-3.100) ppm where he scored the highest concentration in cress taken from Al-Buhidari area that was (2.648 ppm).

The lead was recorded concentrations ranging between (0.856- 0.964) ppm. The increase was primarily different concentrations due to the growth of these plants in contaminated soil this element with the knowledge that its focus in the soil did not exceed the allowable limit, which indicates that the viability absorption high plant for this element if low concentrations and this points to the seriousness of growing plants in soil contaminated with this item. The lead of the dangerous elements that sometimes transmitted from plant to body outset of human and animal through the food chain and is dangerous as cumulative as the cause physiological damage such as mental retardation and a lack of vital functions. We have lead in most waste batteries factories and the dyes factories and automobile junkyard (oils and gasoline). Moreover, zinc concentrations were the extent of concentrations between (1.225-3.799) ppm. For cadmium, concentrations were ranging between (0.15-0.24) ppm. The manganese concentrations ranged in the studied plants between (20.409-32.920) ppm.

Table (4): Elements levels of plants.

Sample Name	*Sample No.*	*plants*	*Cu ppm*	(%) *RSD*	*Fe ppm*	(%) *RSD*	*Cr ppm*	(%) *RSD*	*Pb ppm*	(%) *RSD*	*Zn ppm*	(%) *RSD*	*Mn ppm*	(%) *RSD*	*Cd ppm*	(%) *RSD*
Al-Abbassiya near Euphrates river	*1*	*bean*	10.684	0.0061	1.409	0.038	0.478	0.004	0.964	0.028	1.344	0.2082	32.92	0.007	0.183	0.0055
Al-Abbassiya far Euphrates river	*2*	*bean*	10.021	0.0007	34.299	0.067	0.457	0.002	0.851	0.029	1.225	0.2082	21.81	0.006	0.152	0.0048
Al-Buhidari	*3*	*cress*	8.415	0.0053	30.880	0.056	2.648	0.006	0.931	0.030	3.799	0.2194	20.40	0.016	0.245	0.0129
Al-Mishkhab	*4*	*cress*	11.321	0.0069	36.678	0.043	3.100	0.007	0.864	0.041	1.998	0.2064	24.42	0.02	0.226	0.0046
Average			10.110		25.817		1.671		0.902		2.091		24.89		0.201	
*PL**			73		1500		0.5		0.3		100		500		0.3	

PL: Permissible limits according to World health organization WHO (mg/L)

Soil pollution index & plant pollution index (Bready 1974; Sanka 1995)

Soil Pollution Index (*SPI*) and Plant Pollution Index (*PPI*) calculated for each site according to the following equations:

$$SPI = \frac{1}{n} \times \sum_{i=1}^{n} 100 \frac{V_{Si}}{L_s} \quad \ldots\ldots\ldots (12)$$

$$PPI = \frac{1}{n} \times \sum_{i=1}^{n} 100 \frac{V_{Pi}}{L_P} \quad \ldots\ldots\ldots (13)$$

Where:

n= number of elements.
Vs (Vp)= Content of an element in soil (plant), mg/Kg.
Ls (Lp)= Limit values for an element in the soil (plant), mg/Kg.

Soil Pollution Index (*SPI*)

Sample Name	Sample No.	Depth	SPI
Al-Abbassiyanear Euphrates river	1	Surface	8.766
	2	10cm	8.551
	3	20cm	9.496
Al-Abbassiyafar Euphrates river	4	Surface	10.737
	5	10cm	10.838
	6	20cm	11.158
Al-Buhidari	7	Surface	20.359
	8	10cm	18.782
	9	20cm	19.039
Al-Mishkhab	10	Surface	17.941
	11	10cm	17.288
	12	20cm	16.719

Plant Pollution Index (*PPI*)

Sample Name	Sample No.	plants	PPI
Al-Abbassiyanear Euphrates river	1	bean	114.215
Al-Abbassiyafar Euphrates river	2	bean	74.41
Al-Buhidari	3	cress	143.42
Al-Mishkhab	4	cress	155.074

CONCLUSION

That the value of the salinity of agricultural soils under study is very high salinity according to classified U.S. Salinity Laboratory U.S.D.A. to soil salinity. Calculated moisture coefficient values were greater than one for all models. All element appear low value than Permissible limits according to World health organization WHO. Soil pollution and plant pollution index show that high transfer from soil to plant.

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