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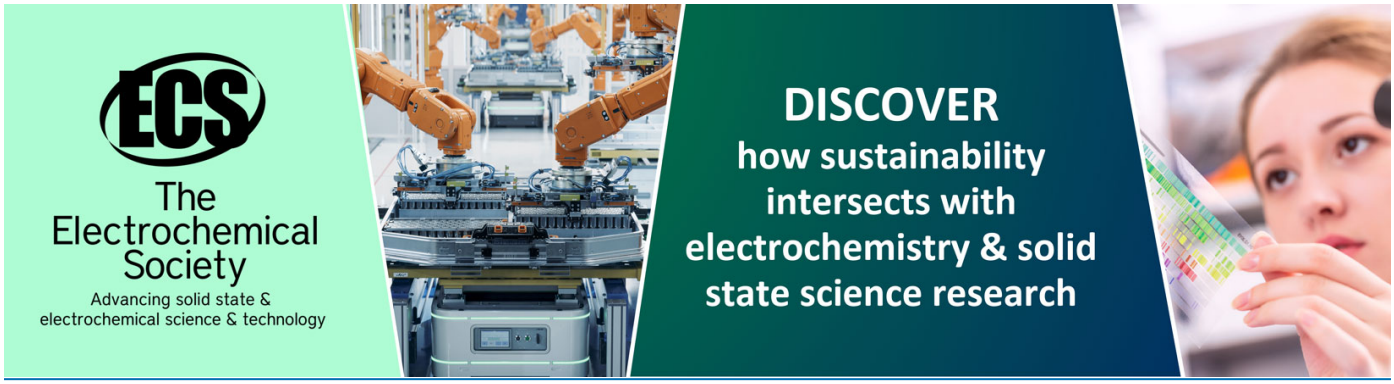

Studying of some physiological characters of macrophyta in middle of Iraq.

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Abstract. Samples from four sites of Al-Abbasiya River middle of Iraq were collected from sediment and macrophyta , for the period from March , 2012 to February, 2013including studying properties of physiological of aquatic macrophyta by selecting seven species of aquatic plants *:Phragmites australis* Cav., Typha *domengensis* per. *Ceratophyllum demersum*L., *Elusine indica* L *Potomogeton. crispus* L *Potomogeton pectinatus* L. *and Myrophyllum verticillatum* L. Physiological parameters include (Humidity, pH , TDS, Ascorbic acid, salinity, Chlorophyll, Cl).*Typha domengensis* reveled higher values of physiological characters compare with other studying species.

Keywords. Macrophyta , physiological characters, Al-Abbasiya River .

1. Introduction

In natural aquatic environment with its water quality is considered the main factor controlling the state of health and disease in aquatic ecosystems.

A wide variation of morphological and physiological traits accompanies with plants of different ecosystems in a sort of harmonization between plant response and environmental constraints to improve adaptation. Adaptation is based on many morph-anatomical and physiological traits expressed in different organs at different levels[19]The presence or absence of aquatic macrophytes in aquatic systems is the result of alternative stable states that are being complex interactions and feedback loops between the biotic community and abiotic environment [20] . Environmental factors are substance Plants exposure to biotic and abiotic stress induces a disruption in plant metabolism implying morphological, anatomical and physiological response [6]. Abiotic stress is one of the most important features of, and has impact on growth and, severe losses in the field yield [17].Macrophytes have constitutive basal defense mechanisms [23].lead to an activation of complex signaling of defense varying from one stress to another [1]

2. Materials and methods

The studied area was about 32 km represented by four sites along Euphrates River (Al-Abbasiya branch) during Mar. 2012 to Feb. 2013. Samples of aquatic plants were collected from study sites.).Aquatic plants samples were collected from the same site and kept in polyethylene bags and transported to lab. All samples crushed and finally measured pH depended [21]Humidity by [6],(TDS by Multimeter, Ascorbic acid, salinity, Chlorophyll by [16].

3. Results and Discussion

Table 1. Range of some physical and chemical properties of Macrophyta between March , 2dddn 012 to February , 2013, in site ,1.

Month	Humidity	pH	TDS	Salinity ‰	E.C (µ/Scm)	Ascorbic acid(mg/L)	Chl. A(µ/L)
P.australis	26.15-4.32	8-6.44	0.42-0.12	1.92-0.16	300-250	2.29-0.63	8.47-3.21
T.domengensis	30.73-8.92	8.45 -8.38	0.87-0.36	1.79-0.12	280-200	2.09±0.92	10.37-4.96
C.demersum	16.51-5.32	19.7-5.67	0.42-0.14	0.96-0.64	150-100	3.03-1.03	5.63±2.14
P. pectinatus	3.42-1.30	1.20-0.11	14.33-0.14	1.28-0.48	200-75	0.93-0.53	1.38-0.38
M. verticillatum	11.64-5.62	5.73±3.26	24.00-9.44	0.70-0.03	110-60	2.54-1.20	6.01-2.31
p. crispus	0.00	0.00	1.53-0.25	0.57-0.03	90-50	0.00-0.00	0.00-0.00
E. indica	0.00	0.00	0.16-0.1	0.58-0.04	91-56	0.00-0.00	0.00-0.00

Table 2. Range of some physical and chemical properties of Macrophyta between March , 2012 to February , 2013, in site ,2.

Month	Hum.	pH	TDS(mg/L)	Salinity‰	E.C (µ/Scm)	Ascorbic acid(mg/L)	Chl. A(µ/L)
P.australis	23.54-2.94	6.77-4.20	37.00-9.14	3.77- 0.02	590-320	3.29-1.20	8.21-3.01
T.domengensis	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00	0.00-0.00
C.demersum	17.99-8.69	6.44-3.25	0.30-0.2	2.24-0.12	350-201	3.25-1.32	7.13-3.62
P. pectinatus	5.56-3.26	1.86-0.23	1.00-0.52	1.984-0.16	310-250	0.87-0.440	8.20-2.69
M.verticillatum	19.55-10.14	5.56-3.66	0.66-0.14	0.485-0.03	759-610	3.71-1.85	5.86-1.53
p. crispus	11.79-8.21	4.03-3.21	15.00-0.63	0.652-0.06	1020-999	3.18-1.30	0.21-0.01
E. indica	6.08-2.14	0.63-0.12	22.33-0.55	0.704-0.04	1100-640	0.25-0.03	0.85-0.18

Table 3. Range of some physical and chemical properties of Macrophyta between March , 2012 to February , 2013, in site ,3.

Month	Hum.	pH	TDS (mg/L)	salinity‰	E.C (µ/Scm)	Ascorbic acid(mg/L)	Chl. A(µ/L)
P.australis	24.17-3.16	6.98-2.41	0.22-0.1	3.13-0.19	4900-3010	3.27-1.19	9.94-4.21
T.domengensis	4.14-1.06	1.25-0.11	0.68-0.26	2.11-0.18	3300-2900	0.13-0.001	0.25-0.01
C.demersum	16.27-5.01	5.92-1.36	0.22-0.14	1.85-0.12	2900-2000	2.83-0.72	7.39-3.77
P. pectinatus	7.29-5.32	1.25-0.11	0.18-0.11	0.13-0.06	2100-999	0.82-0.42	1.07-0.45
M.verticillatum	7.29-3.62	5.75-4.52	0.05-0.01	1.20-0.96	1890-1500	2.11-1.21	6.35-2.59

p. crispus	0.00-0.00	0.00-0.00	0.00-0.00	0.00±0.00	0.00-0.00	0.00-0.00	0.00-0.00
E. indica	17.34-9.21	5.96-1.63	6.12-5.32	1.08-0.07	1700-1200	2.44-1.03	7.75-2.69

Table 4. Range of some physical and chemical properties of Macrophyta between March , 2012 to February , 2013, in site ,4.

Month	Moisture.	pH	TDS(mg/L)	Salinity ‰	E.C (µ/Scm)	Ascorbic(mg/ L) acid	Chl. A(µ/L)
P.australis	24.34-2.24	6.50-2.02	0.17-0.04	2.810.14	440-221	2.66-0.83	9.32-4.11
T.domengensis	20.52-5.24	5.53-3.63	0.67-0.21	2.49-0.12	390-200	2.43-0.89	8.65-5.92
C.demersum	23.08-11.35	5.75-2.08	0.44-0.36	0.67-0.05	105-87.6	2.32-0.63	8.66-4.20
P. pectinatus	14.88-7.62	4.11-1.01	35.00-9.26	0.71-0.03	11.1-55.5	2.10-0.95	8.20-2.69
M. verticillatum	19.87-10.29	5.12-1.25	0.37-0.44	1.34-0.06	210-99.9	1.88-0.92	5.86-1.53
p.crispus	11.71-3.21	1.55-0.25	0.22-0.1	0.06-0.04	99.9-64	0.01-0.00	0.21-0.01
E. indica	6.43-2.31	0.60-0.10	0.68-0.26	0.05-0.04	91.1-72	0.20-0.01	0.84-0.34

Table 5 . Appearance and the nature of life form of macrophytes in different sites during the period of study

Months / Species	sites	Mar. 2012	Apr. 2012	May. 2012	June 2012	July. 2012	Aug. 2012	Sep. 2012	Oct. 2012	Nov. 2012	Des. 2012	Jan. 2013	Feb. 2013
P .australis	St1	+	+	+	+	+	+	+	+	+	+	+	+
	St2	+	+	+	+	+	+	+	+	+	+	+	+
	St3	+	+	+	+	+	+	+	+	+	+	+	+
	St4	+	+	+	+	+	+	+	+	+	+	+	+
T.domengensis	St1	+	+	+	+	+	+	+	+	+	+	+	+
	St2	+	-	+	-	-	-	-	-	-	-	-	-
	St3	-	-	-	-	-	-	-	-	-	-	-	-
	St4	+	+	+	+	+	+	+	+	+	+	+	+
C.demersum	St1	+	+	+	+	-	-	+	+	-	+	+	+
	St2	+	+	+	+	+	+	+	+	-	+	+	+
	St3	+	+	+	+	+	+	+	+	-	+	+	+
	St4	+	+	+	-	+	+	+	+	+	+	+	+
P. pectinatus	St1	-	-	-	-	+	-	-	-	-	-	-	+
	St2	+	-	+	-	-	-	-	-	-	-	+	-
	St3	-	-	-	-	-	-	-	-	-	+	+	-
	St4	-	+	-	+	+	+	+	+	-	+	+	
M. verticillatum	St1	-	-	-	+	+	+	+	+	+	+	+	+
	St2	-	-	-	+	+	+	+	+	+	+	+	+
	St3	-	-	-	+	+	+	+	+	+	+	+	+
	St4	-	-	-	+	+	+	+	+	+	+	+	+
	St1	-	-	-	-	-	-	-	-	-	-	-	-
	St2	-	+	-	+	-	-	+	+	-	+	+	+

p.crispus	St3	-	-	-	-	-	-	-	-	-	-	-	-
	St4	+	-	+	-	-	-	-	-	-	-	-	-
E. indica	St1	-	-	-	-	-	-	-	-	-	-	-	-
	St2	-	-	-	-	-	-	-	-	-	+	-	-
	St3	-	+	-	+	+	+	+	+	+	+	+	+
	St4	-	-	-	-	-	-	-	+	-	-	-	-

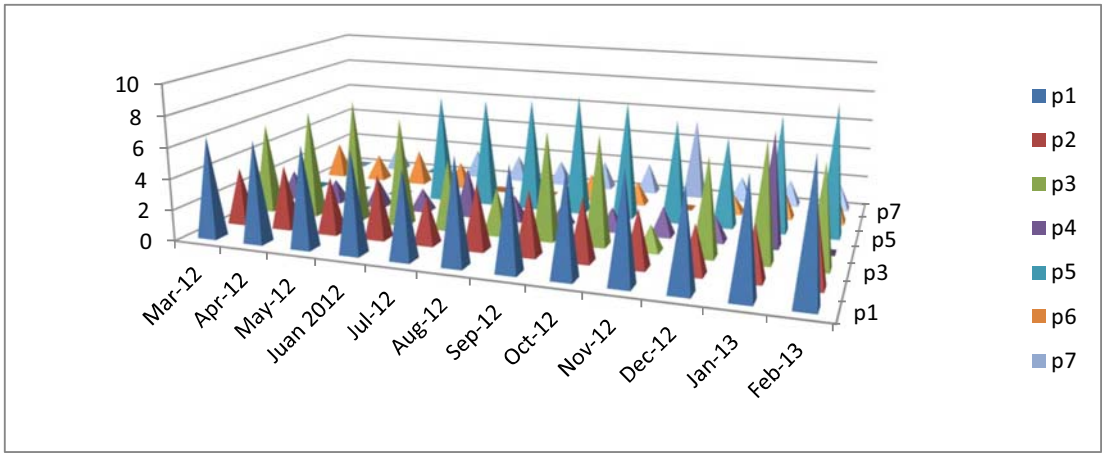

Figure 1. Monthly variation of pH in of macrophyta studying from March , 2012 to February , 2013.

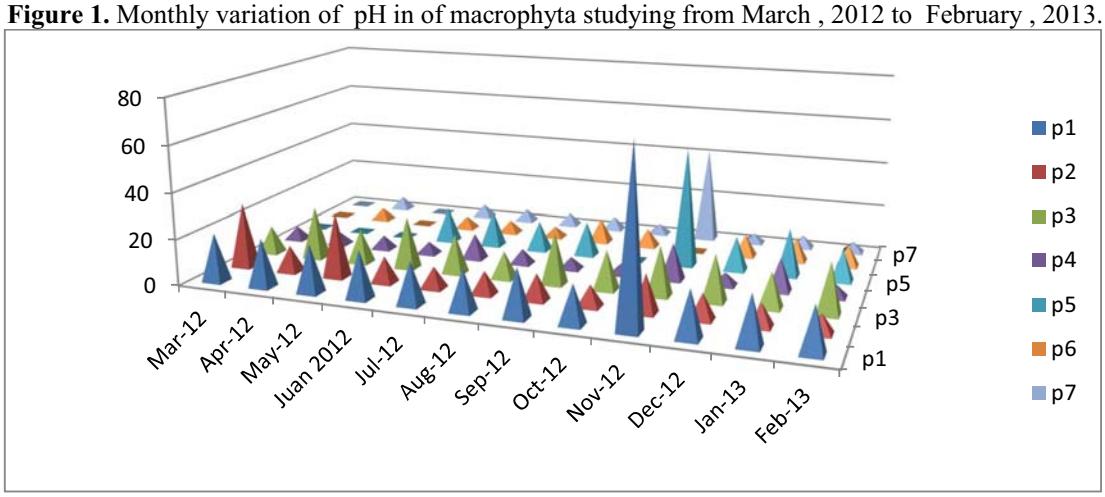

Figure 2. Monthly variation of moisture in of macrophyta studying from March , 2012 to February , 2013

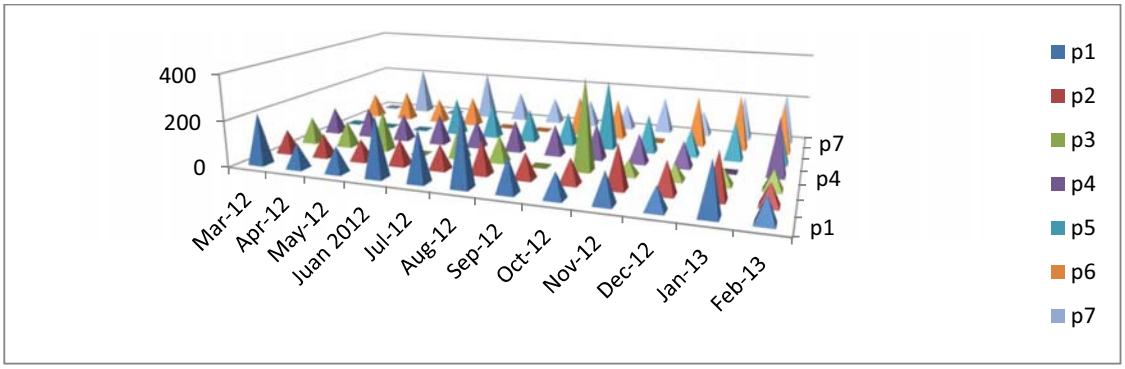

Figure 3. Monthly variation of TDS in of macrophyta studying from March , 2012 to February , 2013.

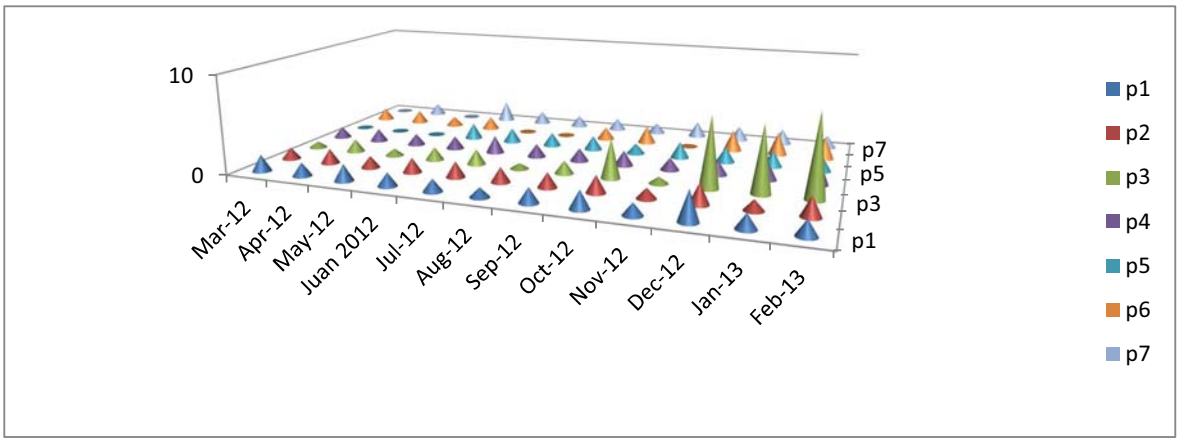

Figure 4. Monthly variation of salinity in of macrophyta studying from March , 2012 to February , 2013.

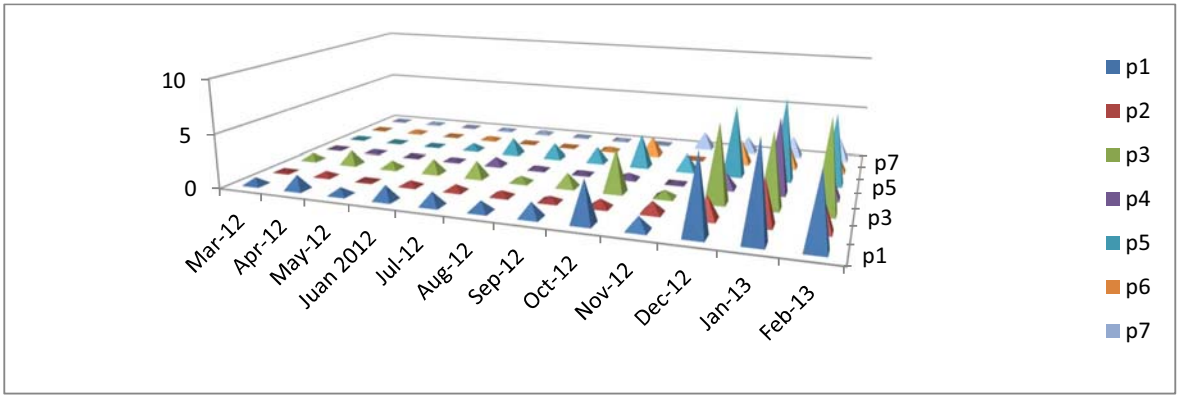

Figure 5. Monthly variation of ascorbic acid in of macrophyta studying from March , 2012 to February , 2013.

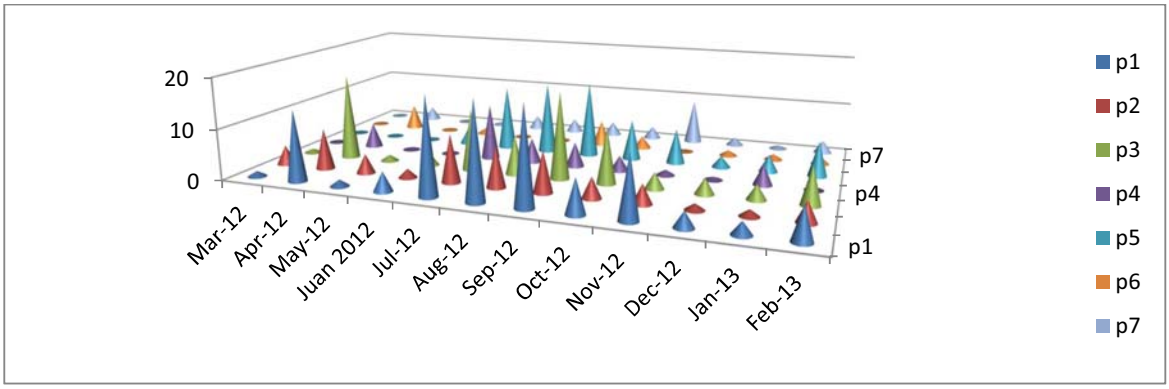

Figure 6. Monthly variation of chlorophyll in of macrophyta studying from March , 2012 to February , 2013.

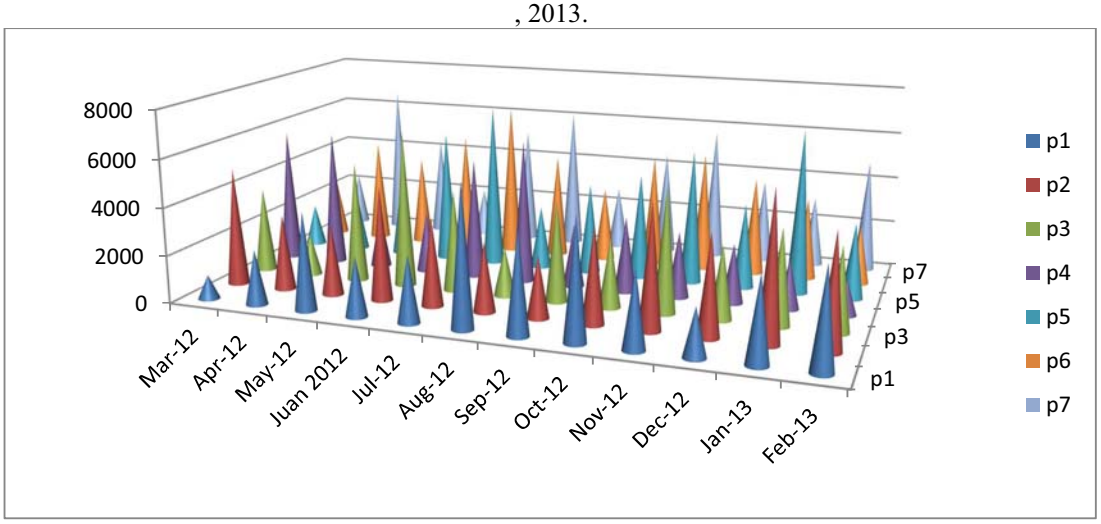

Figure 7. Monthly variation of E.C in of macrophyta studying from March , 2012 to February , 2013.

Climate is considered as a major driving variable that has been affected wetland ecosystem throughout the geological time [20],Iraq's climate nature as vary in temperature, intensity of the brightness of the sun, the length of the day and annual precipitations for the different seasons, as characterized by the Summer months a length of optical duration and high temperatures . Macrophyta plants appearance and its life form, [19]Higher concentration of humidity was recorded in *P.australis* was 26.15 in site 2 and lower 3.42 in site 1 *E. indica* because this phenomenon was common in other Iraqi inland waters that less the surface leaf area to the thin leaves and attached with shoot that increase the pressure upon grazing by herbivores or because of the nature of the substances secreted by the plant through the leaf and shoot recorded in the results of many authors [9]; [13]; [12]; [15]; [6]; [5]; [10; [3]; [14]and [20].

In this study pH was present study fluctuated between (6.7-8.83), that confirm what mentioned by([7].;;,they concluded that alkaline property is common feature in Iraqi inland water because the high content of calcium bicarbonate. This founded agreed with [23]; [11]; [2]. The above factors are closely significant and positively associated with each other, because the electrical conductivity is an important factor to know the total amount of salts in the water. This was confirmed by[2] and the high value of nitrogen compounds and, which increased with decrease consumption processes of living organisms because of minimizing vegetation in Autumn [17].The first site superiority over all study sites in a number of species, that because of the source of fresh water comes from the Euphrates River, through it to the rest sites. This effects the concentrations of environmental factors, salinity and the

amount of was more appropriate than other sites for plant growth of many species The second site was less sites in a number of species, that because of the composite municipal wastewater , also This effects the concentrations of environmental factors, salinity and the more appropriate than other sites for plant growth of many species [8]. The second site was less sites in a number of species, that because of the composite municipal waste water , also contains different chemicals from industry. April month has the highest number species of plants showed, while August and September were less months in which the plants appear. the plant has the highest growth and storage of organic matter at April as a result of providing all the growth requirements of the intensity of solar radiation and the availability of nutrients and proper temperatures [1]. The rest of the plants, they appear and disappear depending on the changing seasons, the plants, they appear and disappear depending on the changing seasons, locations, and this shows the best adaptation of *Phragmites australis* for different environmental conditions.

These macrophytes species belong to three categories: Submerged species, representing by Ceratophyllum demersum, , Eiusine indica , Myrophyllum verticillatum Potamogeton crispus, Potamogeton pectinatus, and the dominant emergent species, Phragmites australis, Typha domingensis, and Species diversity increases with decreasing salinity and water depth; also, increasing water nutrient and light penetration play important role in increasing species diversity[2] .

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