Taxonomic Study of Epiphytic & Epipelic Algae in Southern Iraqi Marshes

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Abstract

This study was done in three southern Iraqi marshes(Al-Hammer, Al-Chebiash , Al-Hawiza) during 2006 to identify epiphytic and epipelic algae for six sites (two sites for each marsh), So monthly samples were collected from February 2006 to July 2006 for epiphytic algae on submerged plant (*Potamogeton pectinatus L*.) with seasonally samples for epipelic algae , The results showed that *Cocconeis placentula var.euglypta (Ehr.)Cl.* , *Cocconeis. pediculus* Ehr., *Fragilaria capucina Demazieres* **,***Microcystis aeuroginosa kütz* were identified as most frequent species by occurrence in all sites, a high total cell number (88116.3)cell×10^4/g was recoded in Al-Chebiash marsh on March 2006 (site3) for epiphytic algae *Cymbella affinis (kütz.)* while a lowest number(15.6)cell×10^4/g was also recorded in Al-Chebiash marsh for epiphyticspecies*Oedogonium Sp.* On February 2006 (site 3)**,** Also Al-Chebiash marsh was identified as a most abundant marsh for a species diversity during a study period.

Kew words:epiphytic,epipelic,algae, seasonal variation, southern Iraqi Marshes

الخلاصة

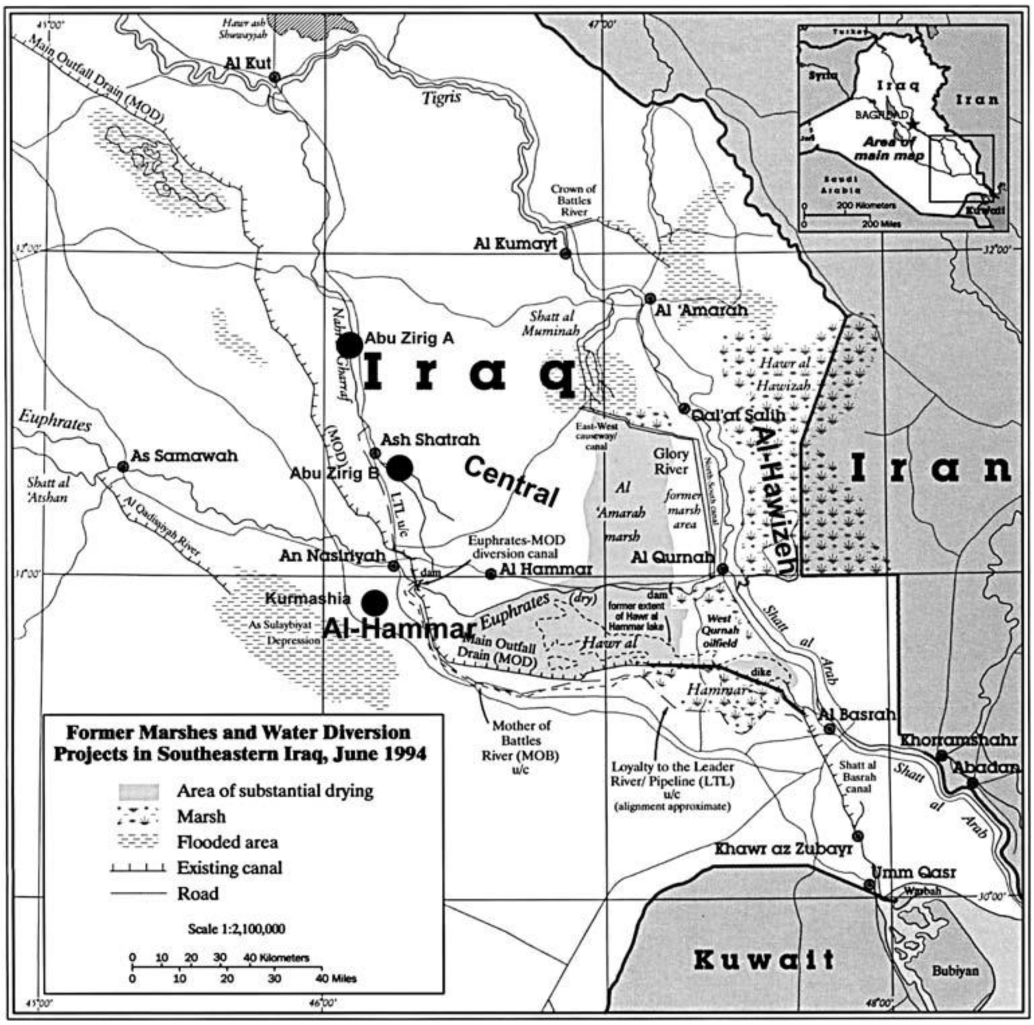
أنجزت هذه الدراسة في ثلاثة اهوار جنوب العراق (الحمار,الجبايش,الحويزة) خلال عام 2006 لتحديد أنواع الطحالب الملتصقة على النبات والطين ولستة مواقع (موقعين لكل هور),حيث جمعت عينات شهرية للطحالب الملتصقة على النبات وعينات فصلية (*Potamogeton pectinatus L.*) للفترة من شهر شباط 2006 ولغاية شهر تموز 2006 من النبات ، *Cocconeis placentula var.euglypta (Ehr.)Cl* للطحالب الملتصقة على الطين وأظهرت النتائج بان ألأنواع و *Microcystis* *Fragilaria capucina Demazieres aeuroginosa kütz*، *Cocconeis. pediculus* Ehr.. الأكثر تواجدا من خلال ترددها في جميع محطات الدراسة وأعلى عدد للخلايا الكلي (88116.3 cell×10^4/g) سجل في هور الجبايش لنوع *Cymbella affinis (kutz.)* خلال شهر آذار 2006 (موقع رقم 3) وهو من الطحالب الملتصقة على النبات . بينما اقل عدد للخلايا الكلي (15.6 cell×10^4/g)سجل أيضا في هور الجبايش لنوع *OedogoniumSp* خلال شهر شباط 2006 (موقع رقم 3) للطحالب الملتصقة على النبات وتميز هور الجبايش بأنه أكثر الاهوار غزارة من حيث وفرة ألأنواع.

Introduction

The epiphytic algae act as indicators of the extent of water pollution , as well as being of great importance as primary producers in the food chain in water ecosystem(Dere etal.,2002). lowland Iraqi marshes represent by dominancy of diatoms species, all species of algae characteristic as benthic community , and periphyton algae was more conspicuous in the February than September (Mauloodi etal., 1981). On the same environment (Al-Mousawi etal., 1990) studied epiphytic algae community in Shatt Al-Arab estuary, and they found the phytoplankton community was dominated by diatoms, most of taxa were of benthic origin, and among six macrophytes studied, *Ceratophyllum demersum* showed a highest number of epiphytic taxa, non- diatoms algae was recorded by (Al-saboonchi etal., 1990) when studied on Shatt Al-Arab river and some canals in Iraq, and they recorded 53 taxa.(Subba-Rao&AL-Yamani,1998)studied phytoplankton ecology in waters between Shatt Al-Arab and straits of hormuz, and they found a production in southern waters is probably lower than in northern waters due to impacts of oceanic waters, and numbers of taxa phytohydrographically associate with Equatorial sub-surface. epiphytic diatoms was used as biomointers in relationship with water quality by (winter & Duthie,2000) in two tributaries of grand river in Ontario. Canada, by used Canonical correspondence analysis showed measured water quality explained gradient of diatoms related to alkalinity, suspended solids, BOD, conductivity, and pH. Seasonal changes in composition and biomass of epiphytic algae on *Ranunculus penicillatus*, and *Cladophora* in a chalk stream had been studied by (shamsudin &sleigh,2004) , and they found that maximum number of epiphytic algae in April with peak in October, biomass and numbers are less in *cladophora* but similar.(Fisher & Dunbar ,2007) used epiphytic diatoms for river water quality monitoring with replication is employed to investigate the magnitude of variation in diatoms biomass community that are typical of the surrounding natural substrate. epiphytic Diatoms assemblages attached to the leaves of submerged macrophytes *vallisneria aethiopica* analyzed according to response of human impacts, 9993 diatoms belonging to 40 genera were identified, the most abundant genera were *Achanathidium* and *Gomphonema* which made up 23.4%, 42.9% of total diatoms count respectively, *Achanathidium* found in area with minimal human activities while *Gomphonema* in area with increased in human activities, also Shannon diversity index and evenness did not differ significantly among sites, and some species of epiphytic diatoms decreased with increasing of nutrients levels (phiri etal., 2007), In addition epiphytic diatoms used as useful indicators for aquatic condition, So (charles,2007) conducting study in Florida wetland determine if autecological metrics, and ultimately indices of biotic integrity, could be developed using mean autecological values at the genus, species, and subspecies taxonomic levels, and to investigate the potential benefits of increased taxonomic resolution ,Thirty genera, 148 species, and 26 subspecies were identified, also specific conductance, soil pH, soil and water total phosphorous, and water color were related with to site non-metric multidimensional scaling (NMDS) ordination scores at each taxonomic level Although algae are contribute to primary production in aquatic ecosystem but epipelic algae remain poorly understood, Epipelic algae perform a range of ecosystem functions including biostabilisation of sediments, regulation of benthic–pelagic nutrient cycling, and primary production. In Alaska, (Stanely,1976) studied a productivity of epipelic algae in Tundra pond, and found chlorophyceae and cyanophyceae are most abundant, Epipelic photosynthesis is limited to a period (June through August) and has a single broad peak in mid—July of °200 mg C°m(-2)° day(-1), and consider sediment surface, lower water temperatures, and a shorter ice—free period as effecting factors on growth of epipelic algae, (Staats&stal, 2000) showed how effect of Exopolysaccharide accumulation &intracellular carbohydrates with depletion of nitrogen on growth of epipelic algae , and how stimulation of Exopolysaccharide while Si or Fe depletion did not stimulate exopolysaccharide accumulation, and they indicated that both exopolysaccharides and intracellular carbohydrates accumulated as a result of overflow metabolism. In Japan (Watanabe etal ., 2000) A total of 93 species and 67 species of epipelic algae occurred in two sites of small pool in Miyatoko, and they observed seasonal fluctuation of total cell number of species , a predominant for Diatoms and Desmids with low in biomass& diversity of epipelic algae in two pool.. Yedigöller Lakes in Turkey studied from (Sahin, 2002) to identify epipelic& epilithic algae, he determined 90 taxa (43 belonging to Bacillariophyta, 33 to Chlorophyta, 11 to Cyanophyta and three to Euglenophyta), and Based on the algal community composition, the Yedigöller Lakes can be characterized as oligotrophic. (McMaster& Schindler, 2005) studied in Canada a response of planktonic& epipelic to nutrient deposition and climate change Based on nitrogen to phosphorus ratios, with some of chemical variables such as dissolved organic carbon (DOC), pH, and conductivity , and they found Epipelon abundance was best explained by nitrite plus nitrate and community composition was best explained by TP and dissolved organic carbon (DOC). In addition to nitrite plus nitrate, However, because we found interannual variability in the environmental-algal relationships, several years of study may be required in order to make realistic predictions on how algal communities will respond to increasing nutrient deposition and climate change. Study of epiphytic & epipelic algae is important to know well how a food web configuration on marshes.

Study area description

The marshes are located in the southern parts of Iraq(between 30°35'-32°45N and 46°13'-48°00'E), they occupy an area of about 35,000km² as permanent marshes, the depth is generally less than 2m, and sometimes reaches to 7m, Site (1) Al-negarah, and site(2) Al-Bargha were chose from Al-Hammer marsh which constitutes about 21% of the total marshes area, Site(3) Beginning of Baghdadia, and site (4) middle of Baghdadia were selected from central marshes(Al-Chebiash), and site (5) Um-alwarid, site(6)Um-alniaj were identified as two sites for Al-Hawizeh marsh to collect samples.(Fig.1)



Fig(1):Study area and sampling sites in three southern Iraqi marshes

Materials and Methods

Monthly Samples were collected for epiphytic algae from submerged plant ((*Potamogeton pectinatus L.*) for six sites of three marshes from February 2006 to July 2006, all samples were treated with shaking and sonication methods to identify more species (Bell, 1976), and Haemocytometer method was used for qualitative study according to Patrick &Reimer (1975), While Seasonally samples were collected for epipelic algae from upper 0.5 - 1.0 cm surface layer of the sediment for six sites of three marshes , epipelic algae were attracted by using lens paper tissue as described by Eaton and Moss(1966), and non-diatoms were counted by Haemocytometer according to(Martinez etal., 1975). Desikachary(1959), Fritsch(1965), (Prescott,1973), Germain (1981), (Hustedt,1985), (Snoijs&Balashova,1998), and (Hällfors,2004) were used as taxonomic keys references to identify both epiphytic and epipelic algae during study period, and the results expressed as cell×10^4/g for epiphytic algae and cell×10^4/cm² for epipelic algae.

Results

Cocconeis placentula var.euglypta (Ehr.)Cl. , *Cocconeis. pediculus* Ehr., *Fragilaria capucina Demazieres* **,** *Microcystis aeuroginosa kütz* were identify as most frequent species through dominance in all six sites , (27) epiphytic species were detected in Al-Hammer marsh and *Cocconeis placentula var.euglypta (Ehr.)Cl.* , *Cocconeis. pediculus* Ehr., *Fragilaria capucina Demazieres*, *Microcystis aeuroginosa kütz*, *Rhoicosephenia curvata* (Kütz) Grunow, *Chlorella Sp*., *Cymbella Sp*., *Synedra ulna* (Nitz.) Ehr. , *Nitzschia Palea* (Kütz) W. Smith, and *Ulothrix Sp* were identify as dominance sp through occurrence at both sites of Al-Hammer marsh, a highest total cell number (57828.9 cell×10^4/g)was recorded for *Fragilaria capucina Demazieres* in July 2006 (site 1), while a lowest total cell number (30.4 cell×10^4/g)was recorded for Chlorella Sp in March 2006 (site 2) (**Table 1-6**). Al-Chebiash marsh identify by abundance of species (63) with occurrence of Euglenophyceae species, Johnnesbaptistia pellucid (Dichie)Taylor et Dr, Oscillatoria Sp, Amphiprora alata (kütz), *Cocconeis placentula var.euglypta (Ehr.)Cl., Fragilaria capucina Demazieres, Chlamydomonas sp.,* Scendesmus *bijuga (Turp.)Lag. , Oedogonium Sp., Spriogyra Sp.* , Anabaena *subcylindericaBorg. , Rivularia Sp.* , *Cocconeis. pediculus* Her. , *Cymbella SP.* , *Chlorella SP.* , *Microcystis aeuroginosa kütz, Cymatoplura solea w.smith (deBrebisson).* , *Chroococcus turgidus (kütz)Näg.* , *Gleocapsa Sp.* , *Merismopedia minima* Beck., *Cosmarium Sp.* , *Lyngbya Sp. & Niztschia obtusa W.smith* were recorded as a dominance species through occurrence in two sites of this marsh, (88116.3) cell×10^4/g was identified as a highest total cell number for *Cymbella affinis (kütz)* on March 2006 (site 3) , and (15.6) cell×10^4/g was recorded as a lowest total cell number on February 2006 (site 3) (**Table 1-6**). (22) species were identified in Al-Hawizeh marsh, and *Cocconeis placentula var.euglypta (Ehr.)Cl., Cocconeis. pediculus* Her. , *Fragilaria capucina Demazieres, Microcystis aeuroginosa kütz* was considered as a dominance species in this marsh, also *Cocconeis placentula var.euglypta (Ehr.)Cl* recorded a high total cell number (20410.2) cell×10^4/g on February 2006 (site 5), and *Spriogyra Sp* a lowest total cell number (30.4) cell×10^4/g on February 2006 (site 6) (**Table 1-6**).

On the other hand , (23) species of epipelic algae was identified in Al-Hammer marsh with dominancy of *Microcystis aeuroginosa kütz., Cocconeis placentula var.euglypta (Ehr.)Cl*., *Surirella ovata (Kütz.)* , Navicula Sp through study period by present in two sites, and a highest total cell number (6015.3) cell×10^4/cm² for *Gomphonema lanceolatum* Ehr . fo. Turris (Ehr .) Hust on July 2006 (site 1) while a lowest total cell number (30.4) cell×10^4/cm² for *Microcystis aeuroginosa kütz*. On February 2006 (site 1) **(Table 7-10)** . *Lyngbya Sp., Cyclotella minghiniana Kütz., Cocconeis placentula var.euglypta (Ehr.)Cl., Gyrosigma attenuatum (Kütz.)Rab., Mastogloia Sp., Navicula cuspidate var.anbigua (Ehr.)Cl., Nitzschia obtusa* w.smith , *Rhopalodia gibba* (Ehr.*), Chlorella vulgaris* Beyerinck , *Surirella ovata (Kütz.)* were identified as a most frequent epipelic species in central marsh (Al-Chebiash) , and (45) species were recorded through study period with a highest total cell number (6803.7) cell×10^4/cm² for *Rhopalodia gibba* (Ehr.*)* on February 2006 (site 3) , and a lowest total cell number (16.5) cell×10^4/cm² for *Merismopedia gluauca*(Ehr .) Näg on February 2006 (site 4) **(Table 7-10)**. (36) epipelic species were recorded in Al-Hawizeh marsh , and *Meridion* Sp. , *Microcystis aeuroginosa kütz., Cocconeis placentula var.euglypta (Ehr.)Cl*., *Lyngbya* Sp. , *Cocconeis. pediculus* Her. , *Nitzschia palea*(kütz.)w.sm, *Nitzschia* Sp. , *Chlorella vulgaris* Beyerinck , *Achnanthes*Sp. , *Cymbella* Sp. , *Navicula halophila* (Grun.) cleve , *Rhopalodia gibba* (Ehr.*), Synedra ulna* (Nitz.) Ehr were identified as a most dominance species through study period, and *Nitzschia* Sp recorded a highest total cell number (68350) cell×10^4/cm² on July 2006 (site 6) while *Scendesmus quadriquada* (Turp.) Bre'b showed a lowest total cell number (30.4) cell×10^4/cm² on February (site 6) **(Table 7-10)**.

Table (1): Total cell numbers (cell×10□ /g) of epiphytic algae in six sites of three southern Iraqi marshes on February 2006

	Epiphytic algae (cell×10□ /g)					
	Al-Hammer		**Al-Chebiash**		**Al-Hawizeh**	
List of Taxa	***1**	**2**	**3**	**4**	**5**	**6**
CYANOPHYCEAE						
***Anabaena subcylinderica* Borge.**	—	—	**61.4**	**30.7**	—	—
***Chroococcus turgidus (*Kütz.)Näg.**	**245.6**	—	—	**153.5**	—	—
Dactylococcopsis raphidioides Hansg.	—	—	**32**	—	—	—
Gomphospheria aponina Kützing	—	—	—	**245.6**	—	—
***Johnnesbaptistia pellucida (*Dickie) Taylor et Dr**	—	—	**22.1**	**25.2**	—	—
Lyngbya spp.	—	—	—	**30.4**	—	**122.8**
Merismopedia glauca (Ehr .) Näg.	—	—	**98.8**	—	—	—
M.minima Beck.	—	—	—	**245.6**	—	—
Microcystis aeuroginosa Kütz	—	—	**307**	—	**61.4**	—
Nostoc Sp.	—	—	**15.6**	—	—	—
Oscillatoria Sp.	—	—	**61.4**	**30.7**	—	—
Rivularia Sp.	—	—	**22**	**38.1**	—	—
Spirulina laxa G.M smith	—	—	—	—	—	**184.2**
Tolypothrix distorta Kütz	—	**32.1**	—	—	—	—
Phormidium sp.	—	—	—	**45.3**	—	—
BACILLARIOPHYCEAE						
CENTRALES						
Cyclotella minghiniana Kütz.	—	—	—	**4033.1**	—	—
Cyclotella spp.	—	—	—	**5522.3**	—	—
Melosira varians c.A. Agardh.	—	—	—	—	**5669.5**	—
PENNALES						
Achnanthes linearis w.smith	—	—	**592.4**	—	—	—
Achnanthes sp.	—	—	**610.3**	—	—	—
Amphora commutataGrunow.	—	—	**898.3**	—	—	—
Amphiprora alata(Kütz.)	—	—	**816.5**	**828.3**	—	—

Bacillaria sp.	—	—	—	918.3	—	—
Cocconeis placentula var.euglypta (Ehr.)Cl.	171219.9	13606.8	4535.6	5669.5	20410.2	11339
C.pediculus Her.	1133.9	4535.6	—	—	3401.7	5669.5
Cymatoplura solea(Bre´b.)w.sm	—	—	36284.8	—	—	—
Cymbella affinis Kütz.	—	—	72569.6	—	—	—
C.cistula (Henp.)Grun.	—	—	3401.7	—	—	—
Cymbella sp.	—	2267.8	—	—	—	—
Fragilaria capucina. Demazieres	17008.5	3410.7	18142.4	260797	3401.7	5302.8
Gomphonema lanceolatum Ehr . fo. Turris (Ehr .) Hust	—	—	819.3	—	—	—
Gyrosigma attenuatum(kütz.)Rab.	—	—	1133.9	—	—	—
G.scalproides (Rabh) cleve.	—	—	1122.3	—	—	—
Mastogloia Sp.	—	—	422.3	—	—	—
Meridion sp.	—	—	2267.8	—	—	—
Navicula cuspidata var.anbigua (Ehr .) Cl.	—	1133.9	—	1133.9	1133.9	—
Nitzschia obtusa w.smith	—	—	—	—	—	—
N.palea (kütz.)w.sm	17008.5	—	13606.8	—	—	—
Nitzscihia Sp.	—	—	3410.7	—	1133.9	—
Rhoicosphenia curvata(kütz.)Grun.	2267.8	6803.4	—	1133.9	—	2267.8
Rh .abbreviata (C.A.Agardh)	—	515.3	—	—	—	—
Rhopalodia gibba(Ehr.)O.Müll	—	—	1133.9	—	—	—
Synedra ulna (Nitz.) Ehr .	—	1133.9	—	—	—	—
S .acus Kütz.	—	—	—	—	—	—
TabillariaSp.	—	—	—	816.5	—	—
CHLOROPHYCEAE						
Ankistrodesmus falcatus (corda)Ralfs.	—	—	—	122.8	—	—
Cosmarium Sp.	—	—	92.1	706.1	—	—
Cosmarium granatum Bre´bisson ex Ralfs	—	—	—	122.8	—	—
Coelastrums microsporum Nägeli in	—	—	307	—	—	—

A.Braun						
Chlorella Sp.	**153.5**	**61.4**	—	**122.8**	—	**30.7**
Chlamydomonas Sp.	—	—	**61.4**	**30.7**	—	—
Scendesmus bijuga (Turp.) Lag.	**153.5**	—	**122.8**	**245.6**	—	—
S.quadriquada(Turp.) Bre´b	—	—	**122.8**	**153.5**	—	—
Pediastrum boryanum(Turp. Mengh.)	—	—	—	**30.1**	—	—
Ulothrix Sp.	—	—	—	**245.6**	—	—
Closterium Sp.	—	—	—	**30.1**	—	—
Oedogonium rufescens Wittrock.	—	—	**18.3**	**18.7**	—	—
Oedogonium Sp.	—	—	**15.6**	**16.3**	—	—
Stigeonema Sp.	—	—	—	**22.3**	—	—
Spirogyra Sp.	—	—	**153.5**	—	—	**30.4**

***site 1=El-negarah site 2=El-bargah site 3= Beginning of Baghdadia**
site4=Middle of Baghdadia site5= Um-Elwarid site 6= Um-Elniaj

Table (2): Total cell numbers (cell×10□ /g) of epiphytic algae in six sites of three southern Iraqi marshes on March 2006

Epiphytic algae (cell×10□ /g)						
List of Taxa	**Al-Hammer**		**Al-Chebiash**		**Al-Hawizeh**	
	1	**2**	**3**	**4**	**5**	**6**
CYANOPHYCEAE						
***Anabaena subcylinderica* Borge.**	—	—	**98.5**	**60.2**	—	—
***Chroococcus turgidus (*Kütz.)Näg.**	**320.4**	—	—	**215.2**	—	—
Dactylococcopsis raphidioides Hansg.	—	—	**84.5**	—	—	—
Gomphospheria aponina Kützing	—	—	—	**415.7**	—	—
***Johnnesbaptistia pellucida (*Dickie) Taylor et Dr**	—	—	**44.3**	**41.5**	—	—
Lyngbya Sp.	—	—	—	**45**	—	**186.2**
Merismopedia glauca (Ehr .) Näg.	—	—	**153.5**	—	—	—
M.minima Beck.	—	—	—	**310.5**	—	—
Microcystis aeuroginosa Kütz	—	—	**350**	—	**88.5**	—
Nostoc Sp.	—	—	**22.4**	—	—	—
Oscillatoria Sp.	—	—	**120.2**	**80.1**	—	—
Rivularia Sp.	—	—	**46**	**92.5**	—	—

Spirulina laxa G.M smith	—	—	—	—	—	**211.3**
Tolypothrix distorta Kütz.	—	**61.5**	—	—	—	—
Phormidium Sp.	—	—	—	**98.3**	—	—
BACILLARIOPHYCEAE						
CENTRALES						
Cyclotella minghiniana Kütz.	—	—	—	**8011.2**	—	—
Cyclotella Sp.	—	—	—	**9520**	—	—
Melosira varians c.A. Agardh.	—	—	—	—	**2267.8**	—
PENNALES						
Achnanthes linearis w.smith	—	—	**816.9**	—	—	—
Achnanthes Sp.	—	—	**1216.2**	—	—	—
Amphora commutataGrunow.	—	—	**1650.1**	—	—	—
Amphiprora alata(Kütz.)	—	—	**1133.9**	**1133.9**	—	—
Campylodiscus Sp.	—	—	—	**1133.9**	—	—
Cocconeis placentula var.euglypta (Ehr.)Cl.	**35150.9**	**35150.9**	**18519.3**	**10205.1**	**9071.2**	**22678**
C.pediculus **Her.**	**3401.7**	**9071.2**	—	**2267.8**	—	—
Cymatoplura solea(Bre´b.)w.sm	—	—	**60315**	—	—	—
Cymbella affinis Kütz.	—	—	**88116.3**	—	—	—
C.cistula (Henp.)Grun.	—	**7937.3**	**1133.9**	**1133.9**	—	—
Cymbella Sp.	**1133.9**	**22678**	**23811.9**	**17008.5**	**1133.9**	—
Fragilaria capucina. **Demazieres.**	**2267.8**	**5669.5**	**3401.7**	**140603.6**	—	—
Gomphonema lanceolatum Ehr . fo. Turris (Ehr .) Hust	—	—	**1210.3**	—	—	—
Gyrosigma attenuatum(kütz.)Rab.	—	—	—	**1133.9**	**1133.9**	—
G.scalproides (Rabh) cleve.	—	—	**22318**	—	—	—
Mastogloia Sp.	—	—	**919.2**	—	—	—
Meridion Sp.	—	—	**4015.3**	—	—	—
Navicula cuspidata var.anbigua (Ehr .) Cl.	—	—	—	**1133.9**	—	—
Nitzschia obtusa w.smith	—	—	—	**240.3**	**1205.1**	—
N.palea (kütz.)w.sm	**2267.8**	—	—	—	—	—
Nitzscihia Sp.	—	—	**6520.3**	—	**2207.1**	—

Rhoicosphenia curvata(kütz.)Grun.	—	**2267.8**	**2267.8**	—	**1133.9**	—
Rh .abbreviata (C.A.Agardh)	—	**1410.3**	—	—	—	—
Rhopalodia gibba(Ehr.)O.Müll	—	—	**2550.3**	—	—	—
Synedra ulna (Nitz.) Ehr	—	**1550.3**	—	—	—	—
S .acus Kütz.	—	**816.3**	—	—	—	—
TabillariaSp.	—	—	—	**1550.3**	—	—
CHLOROPHYCEAE						
Ankistrodesmus falcatus (corda)Ralfs.	—	—	—	**216.3**	—	—
Cosmarium Sp.	—	—	**61.4**	—	—	—
Cosmarium granatum Bre´bisson ex Ralfs	—	—	—	**30.7**	—	—
Euastrum Sp.	—	—	**122.8**	—	—	—
Chlorella Sp.	**30.4**	—	**61.4**	**122.8**	—	—
Chlamydomonas Sp.	—	—	**61.4**	—	—	—
Scendesmus bijuga (Turp.) Lag.	—	—	**61.4**	**30.7**	—	—
S.quadriquada(Turp.) Bre´b	—	—	—	**30.7**	—	—
Pediastrum boryanum(Turp. Mengh.)	—	—	—	***61.4***	—	—
Ulothrix Sp.	—	—	—	***460.5***	—	—
Staustrum Sp.	—	—	***153.5***	—	—	—
Sphaerocystis Sp.	—	—	***30.7***	—	—	—
Oedogonium Sp.	—	—	***30.7***	***30.7***	—	—
Stigeonema Sp.	—	—	—	—	—	—
Teteaedron Sp.	—	—	***30.7***	—	—	—
Gonatozygon Sp.	—	—	***30.7***	—	—	—

Table (3): Total cell numbers (cell×10□ /g) of epiphytic algae in six sites of three southern Iraqi marshes on April 2006

Epiphytic algae (cell×10□ /g)						
	Al-Hammer		**Al-Chebiash**		**Al-Hawizeh**	
List of Taxa	**1**	**2**	**3**	**4**	**5**	**6**
CYANOPHYCEAE						
Chroococcus turgidus (**Kütz.)Näg.**	—	—	**61.4**	—	—	—
Johnnesbaptistia pellucida (**Dickie) Taylor et Dr**	—	—	**61.4**	**61.4**	—	—
Microcystis aeuroginosa Kütz.	—	—	**153.5**	**61.4**	**2458**	**768.12**
Nostoc Sp.	—	—	**30.7**	—	—	—
Oscillatoria Sp.	—	—	—	**92.17**	—	—
Rivularia Sp.	—	—	**61.4**	**30.7**	—	—
BACILLARIOPHYCEAE	—	—	—	—	—	—
PENNALES	—	—	—	—	—	—
Achnanthes linearis w.smith	—	—	**2267.8**	—	—	—
Achnanthes Sp.	—	—	**1890.3**	—	—	—
Cocconeis placentula var.euglypta (Ehr.)Cl.	**3401.7**	**5610.2**	**6303.6**	**4520.4**	**3401.7**	**5669.5**
C.pediculus **Ehr**	—	—	—	—	—	**1133.9**
Cymatoplura solea(Bre´b.)w.sm	—	—	**1133.9**	**1133.9**	—	—
Cymbella Sp.	**3401.7**	**1133.9**	—	—	—	—
Fragilaria capucina. **Demazieres.**	**3401.7**	**2267.8**	—	—	—	—
Navicula Sp.	—	**1133.9**	—	—	—	—
Nitzschia fonticola. Grun.	—	**1133.9**	—	—	—	—
Rhoicosphenia curvata(kütz.)Grun	**2267.8**	—	—	—	—	—
Rh .abbreviata (C.A.Agardh)	—	**3401.7**	—	—	—	—
Rhopalodia gibba(Ehr.)O.Müll	—	**1133.9**	—	—	—	—
Synedra ulna (Nitz.) Ehr	**5669.5**	**3401.7**	—	**1133.9**	—	—
S .acus Kütz.	—	**1133.9**	—	—	—	—
CHLOROPHYCEAE						
Chlamydomonas Sp.	—	—	—	**92.17**	**307.25**	—
Chlorella Sp.	—	—	—	**61.4**	—	—
Closterium Sp.	**30.7**	—	—	—	—	—
Pediastrum boryanum(Turp. Mengh.)	—	—	—	**30.7**	—	—
Scendesmus bijuga (Turp.) Lag.	—	—	—	**30.7**	**30.7**	—
Tetraedron minimum.(A.Br) Hansg.	—	—	**63.2**	—	—	—
Trochishia Sp.	—	—	**54.3**	—	—	—
Ulothrix Sp.	**30.7**	—	—	—	**29.175**	—
Oedogonium rufescens Wittrock.	—	—	**153.62**	**30.7**	—	—
Stigonema Sp.	—	—	—	**30.7**	—	—

Table (4): Total cell numbers (cell×10□ /g) of epiphytic algae in six sites of three southern Iraqi marshes on May 2006

Epiphytic algae (cell×10□ /g)						
	Al-Hammer		Al-Chebiash		Al-Hawizeh	
List of Taxa	**1**	**2**	**3**	**4**	**5**	**6**
CYANOPHYCEAE						
Chroococcus turgidus (Kütz.)Näg.	—	—	61.45	30.7	—	—
Dactylococcopsis raphidioides Hansg.	—	—	122.9	—	—	—
Gleocapsa Sp.	—	—	61.45	61.45	—	—
Merismopedia glauca (Ehr .) Näg.	—	—	92.17	—	—	—
M.minima Beck.	—	—	153.62	460.87	—	—
Microcystis aeuroginosa Kütz	768.12	768.12	92.17	166.3	460.87	3072.5
Nostoc Sp.	—	—	61.4	—	—	—
Spirulina laxa G.M smith	—	—	30.7	—	—	—
Tolypothrix distorta Kütz.	—	30.725	—	—	—	—
BACILLARIOPHYCEAE						
PENNALES						
Achnanthes Sp.	—	—	2267.8	—	—	—
Cocconeis placentula var.euglypta (Ehr.)Cl.	4510.2	5613.3	1133.9	2267.8	5320.5	6267.8
***C.pediculus* Ehr**	—	—	—	—	—	1133.9
Cymatoplura solea(Bre´b.)w.sm	—	—	1133.9	1133.9	—	—
Fragilaria Sp.	—	—	34017	9071.2	—	—
Nitzschia fonticola. Grun.	1133.9	—	—	—	—	—
Rhoicosphenia curvata(kütz.)Grun	—	—	—	—	—	3401.7
Rh .abbreviata (C.A.Agardh)	—	1133.9	—	1133.9	—	—
Synedra ulna (Nitz.) Ehr	2267.8	1133.9	—	—	—	—
Tabillaria Sp.	—	—	—	3410.7	—	—
CHLOROPHYCEAE						
Ankistrodesmus falcatus (corda)Ralfs.	230.7	—	330.7	—	—	—
Chlorella Sp.	30.7	—	—	61.45	30.7	—
Chlamydomonas Sp.	—	61.54	—	—	—	—
Scendesmus bijuga (Turp.) Lag.	—	—	122.9	61.45	—	—
Pediastrum boryanum(Turp. Mengh.)	30.7	—	61.4	—	—	—
Ulothrix Sp..	30.7	—	—	—	—	307.25
Closterium Sp.	30.7	—	—	—	—	—

Table (5): Total cell numbers (cell×10□ /g) of epiphytic algae in six sites of three southern Iraqi marshes on June 2006

	Epiphytic algae (cell×10□ /g)					
	Al-Hammer		**Al-Chebiash**		**Al-Hawizeh**	
List of Taxa	**1**	**2**	**3**	**4**	**5**	**6**
CYANOPHYCEAE						
***Anabaena subcylinderica* Borge.**	—	—	**320.3**	**514.6**	—	—
***Chroococcus turgidus* (Kütz.)Näg.**	—	—	**92.1**	**184.2**	—	—
Lyngbya Sp.	—	—	**61.4**	—	—	—
Merismopedia tenuissima Lemmermann.	—	—	—	**92.1**	—	—
Microcystis Sp.		**337.7**	**1074.5**	**307**	—	—
Nostoc Sp.	—	—	**115.3**	—	—	—
Oscillatoria Sp.	**30.7**	—	**122.8**	—	—	—
EUGLENOPHYCEAE						
Phacus candatus Huebner	—	—	—	**61.4**	—	—
BACILLARIOPHYCEAE						
CENTRALES						
Melosira varians c.A. Agardh.	—	—	—	—	**6513.3**	
PENNALES						
Achnanthes linearis w.smith	—	—	**2015.3**	—	—	—
Amphora commutataGrunow.	—	—	**4535.6**	—	—	—
Asterionella formosa Hassal.	**7937.3**	—	**4535.6**	—	—	—
Bacillaria Sp.	**26079.7**	—	—	**2267.8**	—	—
Cocconeis placentula var.euglypta (Ehr.)Cl.	**2267.8**	**10205.1**	—	—	—	—
Cymbella Sp.	—	—	**4535.6**	—	—	—
***Fragilaria capucina.* Demazieres.**	—	**24945.8**	—	—	—	—
Gomphonema lanceolatum Ehr . fo. Turris (Ehr .) Hust	—	**1133.9**	—	—	—	—
Mastogloia Sp.	—	—	**1133.9**	—	—	—
Meridion Sp.	—	**2267.8**	—	—	—	—
Nitzschia obtusa w.smith	—	—	—	**3401.7**	**1133.8**	—
N.palea (kütz.)w.sm	—	**27213.6**	**1133.9**	—	—	—
N. fonticola. Grun.	—	**1133.9**	—	—	—	—
Rhopalodia gibba(Ehr.)O.Müll	**3401.7**	—	—	—	—	—
Synedra ulna (Nitz.) Ehr	—	—	—	**1133.9**	—	—
Tabillaria Sp.	—	—	—	**6320.5**	—	—

CHLOROPHYCEAE						
Ankistrodesmus falcatus (corda)Ralfs.	**430**	—	**396.5**	—	—	—
Cosmarium Sp.	—	—	**30.7**	**30.7**	—	—
Chlorella Sp.	—	—	—	**92.1**	—	—
Chlamydomonas Sp.	—	**30.7**	**92.1**	**92.1**	—	—
Scendesmus bijuga (Turp.) Lag.	—	**30.7**	**61.4**	—	—	—
Ulothrix Sp.	—	—	**61.4**	—	—	—
Closterium Sp.	**60.5**	—	—	—	—	—
Oedogonium rufescens Wittrock.	—	—	—	**25.3**	—	—
Oedogonium Sp.	**153.5**	—	**30.7**	**153.5**	—	—
Stigeoclonium Sp.	—	—	—	**30.7**	—	—
Spirogyra Sp.	**61.4**	—	—	—	—	—

Table (6): Total cell numbers (cell×10□ /g) of epiphytic algae in six sites of three southern Iraqi marshes on July 2006.

Epiphytic algae (cell×10□ /g)						
	Al-Hammer		**Al-Chebiash**		**Al-Hawizeh**	
List of Taxa	1	2	3	4	5	6
CYANOPHYCEAE						
***Anabaena subcylinderica* Borge.**	—	—	**425.3**	**615.3**	—	—
***Chroococcus turgidus* (Kütz.)Näg.**	—	—	—	**153.5**	—	—
Gleocapsa Sp.	—	—	—	**122.8**	—	—
G.aeruginosa (Gram.) (kütz)	—	—	—	**61.4**	—	—
***Johnnesbaptistia pellucida* (Dickie) Taylor et Dr**	—	—	**216.5**	**286.3**		
Lyngbya Sp.	—	—	**30.7**	**92.1**	—	—
Merismopedia glauca (Ehr .) Näg.	—	—	—	**2056.9**	—	—
Merismopedia tenuissima Lemmermann.	—	—	—	**736.8**	—	—
Microcystis aeuroginosa Kütz	**61.4**	—	—	**61.4**	—	—
Nostoc Sp.	—	—	**226.3**	—	—	—
Oscillatoria Sp.	—	—	**30.7**	**460.5**	—	—
Phormidium Sp.	—	—	—	**153.5**	—	—
EUGLENOPHYCEAE						
Trachelomonas Sp.	—	—	**30.7**	—	—	—
BACILLARIOPHYCEAE						
PENNALES						
Cocconeis placentula var.euglypta (Ehr.)Cl.	**2267.8**	**6803.4**	—	—	—	**3401.7**
***C.pediculus* Ehr**	—	—	—	—	—	**5669.5**
Cocconeis Sp.	—	**1133.9**	—	—	—	**1133.9**
Cymbella Sp.	—	—	**816.3**	—	—	—
***Fragilaria capucina.* Demazieres.**	**31749.2**	**57828.9**	—	**5669.5**	—	—
Gomphonema lanceolatum Ehr . fo. Turris (Ehr .) Hust	—	**2267.8**	—	—	—	—
Navicula cuspidata var.anbigua (Ehr .) Cl.	—	—	—	**3401.7**	—	—
Nitzschia obtusa w.smith	—	—	**2267.8**	**4535.6**	—	—
N.palea (kütz.)w.sm	**3401.7**	**1133.9**	**1133.9**	**5669.5**	—	—

Nitzscihia Sp.	1133.9	—	—	3401.7	—	—
Synedra ulna (Nitz.) Ehr	—	2267.8	—	9071.2	—	—
S .acus Kütz.	—	2516.3	—	—	—	—
Tabillaria Sp.	—	—	—	5126.3	—	—
CHLOROPHYCEAE						
Ankistrodesmus falcatus (corda)Ralfs.	—	—	30.7	—	—	—
Cosmarium Sp.	—	—	113.2	169.5	—	—
Chlorella Sp.	—	—	—	92.1	—	30.7
Chlamydomonas Sp.	—	—	—	307	—	30.7
Ulothrix Sp.	30.7	30.7	30.7	—	—	—
Closterium Sp.	130.3	—	—	—	—	—
Oedogonium rufescens Wittrock.	—	—	—	30.7	—	—
Oedogonium Sp.	—	—	—	30.7	—	30.7
Spirogyra Sp.	61.4	—	—	—	—	—

Table (7): Total cell numbers (cell×10□ /cm^2) of epipelic algae in six sites of three southern Iraqi marshes on February 2006

List of Taxa	Epipelic algae (cell×10□ /cm^2)					
	Al-Hammer		Al-Chebiash		Al-Hawizeh	
	1	2	3	4	5	6
CYANOPHYCEAE						
Chroococcus turgidus (Kütz.)Näg.	—	—	—	30.7	61.4	—
Gleocapsa Sp.	—	—	—	30.7	—	—
Lyngbya Sp.	—	—	399.1	92.1	—	—
Merismopedia glauca (Ehr .) Näg.	—	—	—	16.5	—	—
Microcystis Sp.	30.7	245.6	—	276.3	—	767.5
BACILLARIOPHYCEAE						
CENTRALES						
Cyclotella minghiniana Kütz	—	—	2267.8	2267.8	—	1133.9
PENNALES						
Achnanthes linearis w.smith	—	—	—	1133.9	—	—
Amphora alata(Kütz.)	—	—	—	617.3	—	—
Cocconeis placentula var.euglypta (Ehr.)Cl.	—	—	4301.7	1133.9	—	13606.8
C.pediculus Ehr	—	—	—	—	—	14740.8

Cymatoplura solea(Bre´b.)w.sm	—	—	**1133.9**	—	—	—
Cymbella affinis (Kütz.)	—	—	—	**1133.9**	—	—
Cymbella Sp.	—	—	**2267.8**	—	—	—
Fragilaria Sp.	**1133.9**	—	**453.5.6**	—	—	**4535.6**
Gomphonema lanceolatum Ehr . fo. Turris (Ehr .) Hust	—	**2267.8**	—	—	—	—
Gyrosigma attenuatum(kütz.)Rab.	—	—	**2267.8**	**1133.9**	—	—
G.scalproides (Rabh) cleve.	—	—	**4301.7**	—	—	—
Mastogloia Sp.	—	—	**2267.8**	**2267.8**	—	—
M.smithii var.amphicephalia Grun.	—	—	—	**4535.6**	—	—
Meridion Sp.	—	—	—	—	**2267.8**	**3401.7**
Navicula cuspidata var.anbigua (Ehr .) Cl.	**1133.9**	—	**1133.9**	**1133.9**	**1133.9**	—
Nitzschia obtusa w.smith	—	—	**1133.9**	**1133.9**	—	—
N.palea (kütz.)w.sm	—	—	—	**453.3**	—	—
Nitzschia Sp.	—	—	**1133.9**	—	—	—
Rhoicosphenia curvata(kütz.)Grun	—	**1133.9**	**5669.5**	—	—	—
Rhopalodia gibba(Ehr.)O.Müll	—	—	**6803.7**	**6803.7**	—	—
Surirella ovata (Kütz.)	—	—	—	**2267.8**	—	—
Synedra ulna (Nitz.) Ehr	**5669.5**	—	**34017**	—	—	**15874.6**
CHLOROPHYCEA						
Chlorella vulgaris **Beyerinck**	—	—	**30.7**	**92.1**	—	—
Scendesmus quadriquada(Turp.) Bre´b	—	—	—	**30.7**	—	**30.4**
Strauustrum Sp.	—	—	**30.7**	—	—	—
Micrasteiaris Sp.	—	—	—	—	—	**30.7**

Table (8): Total cell numbers ($cell\times10^{\square}/cm^2$) of epipelic algae in six sites of three southern Iraqi marshes on April 2006

List of Taxa	Epipelic algae ($cell\times10^{\square}/cm^2$)					
	Al-Hammer		Al-Chebiash		Al-Hawizeh	
	1	2	3	4	5	6
CYANOPHYCEAE						
Anabaena subcylinderica Borge.	—	—	30.7	—	—	—
Microcystis aeuroginosa Kütz	—	309	—	—	460.5	184.2
Phormidium Sp.	—	—	61.4	—	—	—
BACILLARIOPHYCEAE						
PENNALES						
Achnanthes linearis w.smith	—	—	2267.8	—	—	—
Amphiprora alata(Kütz.)	—	—	—	1133.9	—	—
Cocconeis placentula var.euglypta (Ehr.)Cl.	1133.9	2267.8	—	—	7937.3	4535.6
C.pediculus Ehr	—	—	—	—	1133.9	1133.9
Cymbella affinis (Kütz)	—	—	6803.4	—	—	—
Cymbella Sp.	—	—	—	1133.9	—	—
Fragilaria Sp.	1133.9	—	2267.8	—	—	—
Gyrosigma attenuatum(kütz.)Rab.	1133.9	—	1133.9	—	—	—
G.scalproides (Rabh) cleve.	—	—	—	2267.8	—	—
Nitzschia palea (kütz.)w.sm	—	—	—	816.3	—	—
Rhoicosphenia curvata(kütz.)Grun	4535.6	—	—	—	—	—
Rhopalodia gibba(Ehr.)O.Müll	—	—	2267.8	—	—	—
Surirella ovata (Kütz)	1133.9	2267.8	—	—	—	—
Synedra ulna (Nitz.) Ehr	—	5669.3	1133.9	—	—	1133.9
Tabillaria Sp.	—	—	—	1133.9	—	—
CHLOROPHYCEAE						
Cosmarium Sp.	—	30.7	—	30.7	—	—
Chlorella Sp.	—	—	—	—	—	30.7
Chlamydomonas Sp.	—	—	—	—	30.7	—
Scendesmus bijuga (Turp.) Lag.	—	—	—	—	30.7	—

Table (9): Total cell numbers (cell×10□ /cm^2) of epipelic algae in six sites of three southern Iraqi marshes on July 2006

	Epipelic algae (cell×10□ /cm^2)					
	Al-Hammer		Al-Chebiash		Al-Hawizeh	
List of Taxa	1	2	3	4	5	6
CYANOPHYCEAE						
Chroococcus turgidus (Kütz.)Näg.	—	—	—	—	—	69.3
Gleocapsa Sp.	—	—	—	250.5	—	—
Lyngbya Sp.	—	—	—	—	90.1	110.3
Merismopedia glauca (Ehr .) Näg.	—	—	—	89.4	—	—
Microcystis Sp.	—	3070	—	—	—	153.5
Phormidium Sp.	—	—	92.1	—	—	—
BACILLARIOPHYCEAE						
CENTRALES						
Cyclotella minghiniana Kütz	3015.3	—	—	4015.3	—	—
PENNALES						
Achnanthes linearis w.smith	—	—	—	2267.8	—	—
Amphora ovalis (kütz.)	—	—	—	3401.7	—	—
Cocconeis placentula var.euglypta (Ehr.)Cl.	—	2267.8	—	1133.9	2267.8	5669.5
C.pediculus Ehr	3401.7	—	—	—	—	1133.9
Cymatoplura solea(Bre´b.)w.sm	—	—	4513.2	—	—	—
Cymbella affinis (Kütz)	—	—	—	3515.2	—	—
Cymbella Sp.	—	—	—	—	1133.9	—
Fragilaria Sp.	1133.9	—	2267.8	—	—	—
Gomphonema lanceolatum Ehr . fo. Turris (Ehr .) Hust	6015.3	—	—	—	—	—
Gyrosigma attenuatum(kütz.)Rab.	1133.9	—	—	—	—	—
G.spenceri (Quekett) Griffith &Henfrey	—	—	—	1133.9	—	—
Navicula cuspidata var.anbigua (Ehr .) Cl.	—	—	—	1133.9	—	—
Nitzschia obtusa w.smith	—	—	—	1133.9	—	—
N.palea (kütz.)w.sm	—	—	—	1133.9	—	—
Nitzschia Sp.	—	3550.1	—	—	25616.2	68350
Rhoicosphenia curvata(kütz.)Grun	4535.6	—	—	—	—	—

Rhopalodia gibba(Ehr.)O.Müll	—	—	**1133.9**	—	—	—
Surirella ovata (Kütz)	**1133.9**	—	**1133.9**	**2267.8**	—	—
Synedra ulna (Nitz.) Ehr	—	**5669.5**	—	—	—	—
CHLOROPHYCEA						
***Chlorella vulgaris* Beyerinck.**	—	—	—	**61.4**	**30.7**	**30.7**
Chlamydomonas Sp.	—	—	—	**30.7**	—	—
Scendesmus bijuga (Turp.) Lag.	—	—	—	**30.7**	—	—
Strauustrum Sp.	—	—	**196.3**	—	—	—
Micrasteiaris Sp.	—	—	—	—	—	**315.2**

Table (10): Total cell numbers (cell$\times$10□ /cm^2) of epipelic algae in six sites of three southern Iraqi marshes on November 2006

Epipelic algae (cell$\times$10□ /cm^2)						
List of Taxa	**Al-Hammer**		**Al-Chebiash**		**Al-Hawizeh**	
	1	**2**	**3**	**4**	**5**	**6**
CYANOPHYCAEAE						
Anabaena constricta Borg.	**30.7**	—	—	—	—	—
Anabaena Sp.	**46.3**	—	—	—	—	—
***Chroococcus turgidus* (Kütz.)Näg.**	—	—	—	—	—	**30.7**
Gleocapsa Sp.	—	—	—	**88.3**	—	—
***Lyngbya limintica* Lemm.**	—	—	—	—	**30.7**	**30.7**
Merismopedia glauca (Ehr .) Näg.	—	—	—	**30.7**	—	—
Microcystis aeuroginosa Kütz	—	—	—	**92.25**	—	—
Nostoc coeruleum Lyngb.	—	—	**30.7**	**30.7**	—	—
Nostoc Sp.	—	**30.7**	—	—	—	—
***Oscilatoria tenuis* Aghard.**	—	—	—	**64.5**	—	—
O.ornata kütz.	—	—	—	**78.3**	—	—
Phormidium Sp.	—	—	—	—	—	**30.7**
BACILLARIOPHYCEAE						
Centrales						
Cyclotella minghiniana Kütz	**1133.9**	—	—	**2267.8**	—	—
***C .atomus* Hust.**	**2267.8**	—	—	—	**1133.9**	—

Pennales						
A.minutissima Kütz	—	—	—	—	1133.9	—
Achnanthes Sp.	1133.9	—	—	—	22667.8	5669.5
Campylodiscus clypeus Ehr.	—	—	1133.9	—	—	—
C.pediculus Ehr.	1133.9	—	2267.8	—	1133.9	3401.7
Cocconeis placentula var.euglypta (Ehr.)Cl.	—	—	—	—	1133.9	—
Cymbella Sp.	—	1133.9	1133.9	—	1133.9	2267.8
Diatoma vulgar Bory var. vulgar.	—	—	—	—	1133.9	—
Epithemia zebra (Ehr.) Kütz.	—	—	3401.7	—	—	—
Gomphonema lanceolatum Ehr . fo. Turris (Ehr .) Hust	2267.8	—	—	—	1133.9	—
Gyrosigma attenuatum(kütz.)Rab.	—	1133.9	1133.9	2267.8	—	1133.9
Mastogloia smithii var.amphicephalia Grun.	—	—	—	—	—	2267.8
Meridion Sp.	—	—	1133.9	—	—	—
Navicula halophila (Grun.) Cleve	—	—	—	—	1133.9	5669.5
Navicula Sp.	1133.9	1133.9	—	—	2267.8	—
Nitzschia palea (kütz.)w.sm	—	1133.9	—	—	—	—
N.sigma (kütz.) w.smith	—	—	—	—	1133.9	—
Nitzschia Sp.	—	1133.9	—	—	17008.5	45356
Rhoicosphenia curvata(kütz.)Grun	—	—	1133.9	1133.9	—	—
Rhopalodia gibba(Ehr.)O.Müll	1133.9	—	—	—	1133.9	6803.4
Surirella ovata (Kütz)	—	2267.8	2267.8	—	—	2267.8
Synedra ulna (Nitz.) Ehr		2267.8		1133.9	5669.5	10205
CHLOROPHYCEAE						
Chlorella vulgaris Beyerinck.	—	30.7	—	30.7	—	30.7
Scendesmus bijuga (Turp.) Lag.	—	—	—	30.7	92.25	—
Scendesmus quadriquada(Turp.) Bre´b	—	61.5	—	—	—	—
Trochiscia Sp.	—	—	—	30.7	—	30.7
Pediastrum boryanum(Turp. Mengh.)	—	—	61.5	—	—	61.5

Discussion

Periphyton organism are important primary producers in the inland water and frequently contribute a great deal to the energy cycle in such ecosystem (Kassim & Al-saadi , 1995). predominant of Bacillariophyceae is compatible with many studies such as (Al-Saadi&Hadi,1981,Al-Mousawi etal., 1990, Şahin, 2001, Dere etal., 2002, Policˇkova etal ., 2008)when they studied on Arabian gulf, Shatt al-Arab estuary, Lake and stream respectively. Viability of diatoms at different light regimes is related to their adaptive Potential (Aberle & Wiltshire, 2006) . A fluctuations of epiphytic & epipelic species through study period return to Environmental conditions and Geological nature, also grazing, resources limitation, habitat disturbance, substrate availability regulate epipelic biomass and production, ecological effects of parasitism grazing are similar in that alter the abundance and composition of algal population (Poulicˇkova etal ., 2008). Moreover, inorganic pollutants may have constrain a diversity of epiphytic and epipelic species, and the pollutants consider as a limiting factor for growth and dominancy of algal species. Predominant of some species such as *Cocconeis placentula var.euglypta (Ehr.)Cl. , Cocconeis. pediculus* Ehr., *Fragilaria capucina Demazieres* **,** *Microcystis aeuroginosa kütz* due to high tolerance of a wide range of temperature, and unfavorable circumstances. A peak of total cell numbers through spring and summer return to high temperature and high light intensity, Rarely occurrence of Euglenophyceae species are found in many studies as (Şahin, 2001) when he studied epipelic algae in Dagˆba¸s lake in Turkey . Seasonally changes of epipelic species return to their habitat is often fluid , disturbance by water movements and burrowing animal, and another important factor probably causing reduction in the epipelic standing crop was grazing(Hickman & Round, 1970), while a dominance of some species due to these species are motile , which allows them to counteract burial or sinking , or they may form aggregation or " ratts " of filament or cells which float on the sediment surface (Moss , 1977), also light and temperature which ranged in marshes between (28.25-33.0°C) controlled the development of the epipelic community However, there is no doubt that the speed of the water current was the main factor influencing the development of the algal flora(Kolayli *et al*.,1989) .

Al-Chebiash marsh showed a high a abundance epiphytic& epipelic species due to a high diversity of submerged aquatic plants in two sites of this marsh. Also, the currents in this marsh were very slow (almost stagnant) so that the sediment had a better chance of absorbing more nutrients, and lead to more diversity (Kassim & Al-saadi , 1995) ,moreover Al- Chebiash marsh comprises a vast complex of permanent fresh water marsh with scattered areas of open water. A relative low diversity in summer due to algae are eaten by zooplankton and their population is decreased. As a result of this, they lose their biological efficiency.(Akin etal,. 2008), and During the summer months, epiphytic organisms are more exposed to high evaporation rate and desiccation due to higher temperatures, especially in the areas of short and medium plants This factor could have contributed to lower the biomass of the epiphytic community on these plant forms (Jackson *et al* ., 2006).

Carbon was considered as a limiting factors for epiphytic& epipelic algae , also addition of phosphorus, nitrate, or together, ammonia , and silicat to epiphytic algae resulted in no stimulation of photosynthesis rate, and in many cases had a inhibitory effect upon algal growth.(Sheldon& Boylen, 1975) , In addition to nutrient availability, light conditions can regulate colonization patterns of microalgal communities, so micro algae has the ability to stick to surfaces by forming mucilage pads and apparently this feature made it possible for the algae to grow well even on unstable substrates (Aberle & Wiltshire, 2006) . Changes in phytoplankton taxa return to different environmental factors (Antoine & Al-Saadi, 1982**)** such as pH which range between (7-8), marsh water are oligohaline with Salinity range from 1.5-2.8 ppt, and major anions are Cl, HCO3, SO4 and CO3 average values of 240, 78, 39 and 2mg/l respectively. Marshes has high salinity and high Na^+ content(Neghamish &Ali,2005).shallowness of the marsh facilitates the exchange between water column and the sediments which leads to increase concentration of nutrients(Hussain etal., 2007)and Nutrients play important role in diversity of Phytoplankton.

finally Seasonal decrease of water levels also coincided with major increases in biomass of algae, Plant morphology was the next important variable influencing epiphytic biomass, whereas the contribution of other variables (sampling depth, macrophyte species, relative abundance of macrophytes, and temperature) was low(Gosselain etal., 2005).

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