



## **Distribution of zooplankton in the Al-Hawizah, Al-Hammar marshes and Al-Izze river South of Iraq**

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### **Abstract**

Samples of zooplankton were collected seasonally from seven stations in the marshes South of Iraq. For the period from December 2003 to November 2004, by plankton net 120 micron mesh-size. Water temperature, salinity and pH were recorded at each station. The population density of zooplankton ranged between 52 ind./ m<sup>3</sup> at station 5 (Al-Barga region) during Autumn, to 3309 ind /m<sup>3</sup> at station 2 (Al-Turaba region) during Spring 2004. Crustacea was the dominated group in all stations because the Copepoda was very abundant and its comprised 62.4%, 67%, 89.9%, 62.5%, 31.5%, 49.9%, and 64.9%, in stations (1,2,3,4,5,6,7) respectively. The density of zooplankton is governed inversely by water temperature and to lesser extent by salinity. A total of 18 species of Cladocera belonging to 12 genera were identified in the area, 5 species are new records to the Iraqi marshes.

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### **1-Introduction**

In the south of Iraq the Tigris and Euphrates rivers create a vast complex of shallow lakes and marshes variously estimated at between 15000 sq.km and 20000 sq.km in extent. These wetlands comprise a complex of tier connected, shallow, freshwater lakes, marshes and seasonally inundated floodplains extending from within 150 km of Baghdad in the northwest to the region of Basrah in the Southeast. The principal lakes include the Haur Saadiyah and haur Sanniya complex in the North, Haur Al-Hammar in the South and Haur Al-Hawizah in the east (Salim, 1962). Between Basrah and Amara there are immense areas of permanent shallow marsh on either side

of the Tigris. A large swamp close to the Tigris with water from 2 to 4 feet deep, belt of reeds with submerged water plants and extensive open water (Gurney 1921). While Al-Hamed (1966) said the hour Al-Hammar is a shallow lake even during flood, the greatest depth does not exceed three meters. The highest level is reached in spring as results of snow melting in the intake areas of the Tigris and Euphrates. During the ebb, large of the littoral zone are dry on.

Our knowledge of the environmental conditions and the occurrence and distribution of zooplankton in the marshes is very limited. The zooplankton of this region has been dealt with Gurney (1921) who work on fresh water

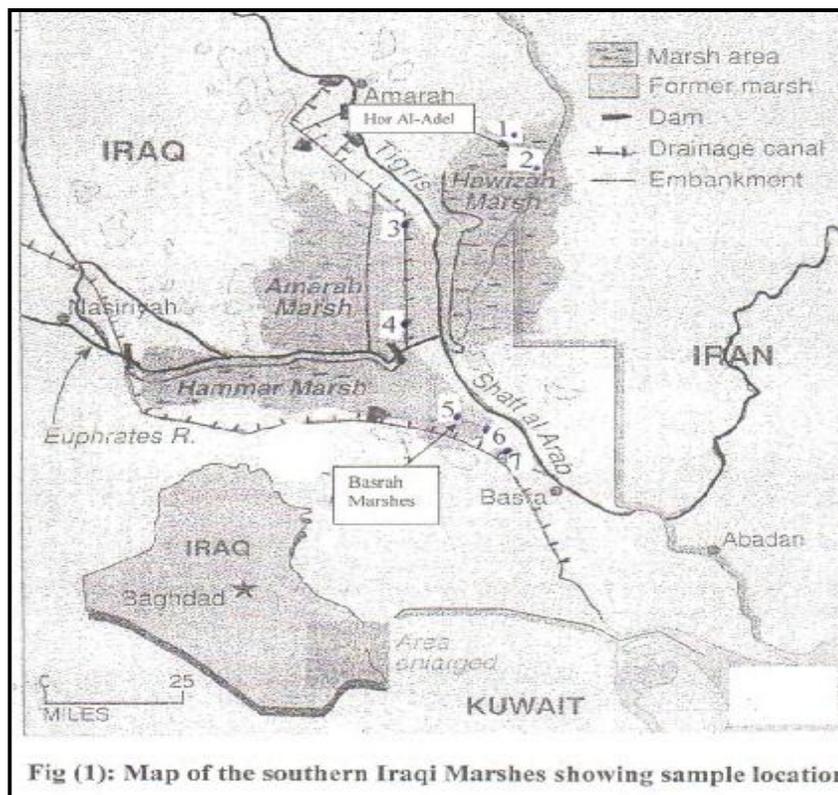
Crustacea in permanent marsh on either side of the Tigris between Basrah and Amara, which record thirteen species of Cladocera in this region. Later Khalaf and Smirnov (1976) who work in the marshes between Qurna and Chibaysh, which record thirteen species of Cladocera in this region. Al-Saboonchi *et al.* (1986) studied the seasonal variation in the quality and quantity of zooplankton in Garma marshes, reported a high zooplankton growth, in late spring. Al-Qarooni (2005) recorded fourteen species of Cladocera in Al-Chabaish, Al-Hammar and Al-Fuhud marshes, the population density of zooplankton ranged between 5150 ind./ m<sup>3</sup> during May in Al-Hammar marshes and 425450 ind./ m<sup>3</sup> during March in Al-Fuhud marsh.

## 2-Materials and methods

The samples of zooplankton were collected seasonally, for the period from December 2003

to November 2004, from seven stations in the marshes South of Iraq (Fig 1). Two stations in Al-Hwaiza marshes, two stations in Al-Izze river and three stations in Al-Basrah marshes South of Hour Al-Hammar. Water temperatures were recorded to the nearest 0.1 °C. Salinity determinations were carried out immediately with a digital salinometer M.C.5 type salinity temperature Bridge. The pH was determined using a pH meter model Hi 8424.

A plankton net of 120 micron mesh-size and 40 cm mouth diameter was used. A digital flowmeter was mounted in the middle of the net mouth. Samples were fixed with 4% formalin. In the laboratory samples were placed in a graduated flask, diluted to a 500 ml. and 3 replicates of 10 ml. each were taken. Counting was carried out using a Bogorov chamber with the aid of a dissecting microscope



### 3-Results

#### Environmental conditions:

Water temperature ranged between 15°C in stations 3,4 and 5 during Winter to 31°C in station 4 during Summer (Fig 2 A). And salinity ranged from 1.0 ‰ in stations 1,3 and 4 during Winter, Spring and Autumn to 4.1‰ in stations 1 and 2 during Autumn (Fig 2 B). While the hydrogen ion concentration (pH) ranged from 7.4 in stations 1 and 3 during Winter to 8.3 in station 4 during Summer (fig 2 C).

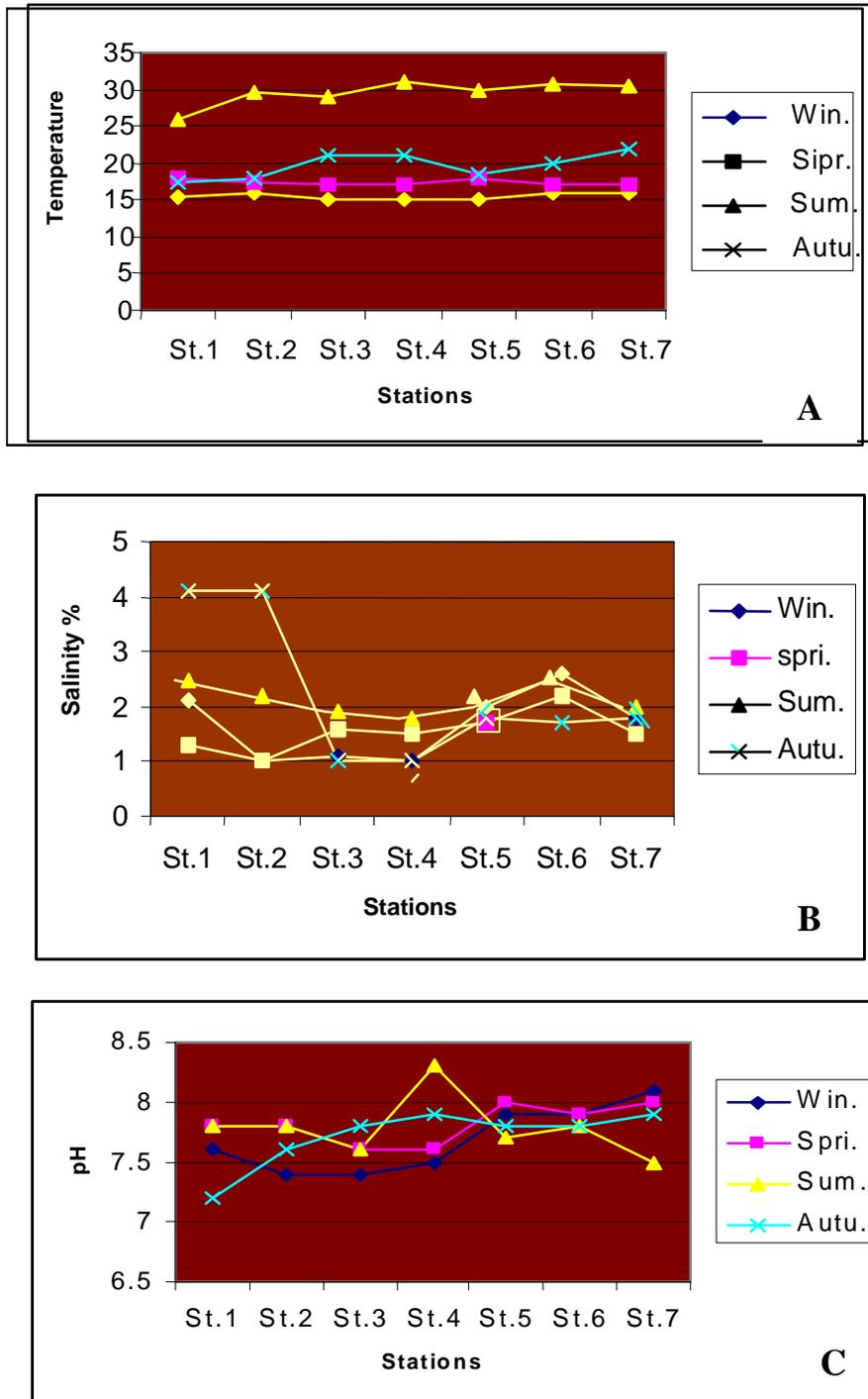
#### Abundance:

The numerical abundance of zooplankton reached its minimum 52 ind./ m<sup>3</sup> in station 5 at Autumn, whereas the maximum 3309 ind./ m<sup>3</sup> in station 2 at Spring. Copepoda dominates zooplankton populations of all stations, except in station 5 the Cirripedia nauplii predominated the zooplankton.

In station 1 (Al-Huwaiza marshes / Om Al-Warred region). The total zooplankton ranged between 61 ind./ m<sup>3</sup> during Autumn season to 661 ind./ m<sup>3</sup> during Spring season. The groups of Copepoda are the major constituents of the zooplankton comprised about 62.4%, the next Rotifera 17% then Insecta 6.6%, of the total zooplankton (Table 1).

However at station 2 (Al-Huwaiza marshes / Al-Turaba region) the total zooplankton ranged between 391 ind./ m<sup>3</sup> during the summer season to 3309 ind./ m<sup>3</sup> during spring season. The assemblage comprised of Copepoda 67%, Insecta 25% and Rotifera 2.4% of the total zooplankton (Table 2).

While at station 3 (beginning of Al-Izze river) the numerical abundance of zooplankton reached its minimum 188 ind./ m<sup>3</sup> in Autumn season. Whereas the maximum 2714 ind./ m<sup>3</sup> occurred in Spring season. Copepoda comprised 89.9%, Insecta 5.3% and Cladocera 3.7% of the total zooplankton (Table 3). In station 4 (end of Al-Izze river) the numbers of zooplankton ranged between 535 – 892 ind./ m<sup>3</sup> during Summer and Spring respectively. Copepoda was comprised 62.5%, Cladocera 23.9% and Insecta 7.08% of the total zooplankton (Table 4). But at station 5 (Al-Barga region) the total zooplankton ranged between 52 – 2115 ind./ m<sup>3</sup> during Autumn and Spring respectively. It was found that the Cirripedia nauplii constituted about 55.4% of the total zooplankton, the second group was Copepoda 31.5% then Cladocera 6.8% (Table 5).



**Fig (2):** Seasonal variations in the value of surface water temperature (A), salinity (B), and hydrogen ion concentration (pH) (C) at the seven studied marsh stations for the period Dec. 2003-Nov. 2004.

**Table (1):** Abundance (ind./m<sup>3</sup>) of various groups of zooplankton at station 2, (Al-Huwaiza marshes / Om Al-Wared region) during the different seasons.

Groups of zooplankton	Winter	Spring	Summer	Autumn	Total	Percentage %
Cyclopoida	55	285	64	31	435	38.5
<b>Harpacticoida</b>	2	16	11	6.3	35.3	3.1
Calanoida	-	0.3	-	1	1.3	0.1
Nauplii	83	135	15	-	233	20.6
<b>Copepoda</b>	140	436.3	90	38.3	704.6	62.4
Cladocera	25	29	3	10.5	67.5	6.0
Cirripedia nauplii	-	30	9	-	39	3.4
Insecta	41	22	5	6.3	74.3	6.6
Ostracoda	-	15	2	-	17	1.5
Decapoda	-	5	0.3	-	5.3	0.5
Zoea	-	-	1	-	1	0.09
<b>Crustacea</b>	206	537.3	110.3	55.1	908.7	80.5
Rotefera	-	115	85	-	200	17.7
Fish larvae	2	5	1	-	8	0.7
Gastropoda	3	-	-	-	3	0.3
Radiolaria	-	0.3	-	-	0.3	0.03
<b>Foraminifera</b>	-	3	0.3	6	9.3	0.8
<b>Total</b>	211	661	197	61	1129	

**Table (2):** Abundance (ind./m<sup>3</sup>) of various groups of zooplankton at station 1, (Al-Huwaiza marshes / Al-Turaba region) during the different seasons.

Groups of zooplankton	Winter	Spring	Summer	Autumn	Total	Percentage %
Cyclopoida	780	2909	48	25	3762	54.9
<b>Harpacticoida</b>	33	21	4	119	177	2.6
Calanoida	-	-	2	-	2	0.03
Nauplii	348	225	66	8	647	9.4
<b>Copepoda</b>	1161	3155	120	152	4588	67.0
Cladocera	66	64	72	0.4	202.4	2.9
Cirripedia nauplii	-	-	7	-	7	0.1
Insecta	913	37	48	712	1710	25.0
Ostracoda	34	37	-	1	72	1.0
Decapoda	2	-	24	-	26	0.4
Zoea	1	-	-	-	1	0.01
<b>Crustacea</b>	2177	3293	271	865.4	6606.4	96.5
Rotefera	33	11	119	-	163	2.4
Fish larvae	-	-	-	2.8	2.8	0.04
Gastropoda	34	-	-	-	34	0.5
Radiolaria	33	-	1	-	34	0.5
<b>Foraminifera</b>	-	5	-	-	5	0.07
<b>Total</b>	2277	3309	391	868	6845	

**Table (3):** Abundance (ind./m<sup>3</sup>) of various groups of zooplankton at station 3, (beginning of Al-Izze river) during the different seasons.

Groups of zooplankton	Winter	Spring	Summer	Autumn	Total	Percentage %
Cyclopoida	398	665	66	64	1193	30.8
<b>Harpacticoida</b>	-	66	2	17	85	2.2
Calanoida	-	-	1	-	1	0.02
Nauplii	66	1928	121	87	2202	56.9
<b>Copepoda</b>	464	2659	190	168	3481	89.9
Cladocera	66	26	40	10	142	3.7
Cirripedia nauplii	-	-	3	-	3	0.08
Insecta	133	26	37	10	206	5.3
Ostracoda	-	-	2	-	2	0.05
Decapoda	20	-	3	-	23	0.6
Zoea	-	1	2	-	3	0.08
<b>Crustacea</b>	683	2712	277	188	3860	99.7
Rotifera	-	2	7	-	9	0.2
Fish larvae	-	-	1	-	1	0.02
Gastropoda	-	-	0.3	-	0.3	0.008
Radiolaria	-	-	0.3	-	0.3	0.008
<b>Foraminifera</b>	-	0.1	0.3	-	0.4	0.01
<b>Total</b>	683	2714	286	188	3871	

**Table (4):** Abundance (ind./m<sup>3</sup>) of various groups of zooplankton at station 4, (end of Al-Izze river) during the different seasons.

Groups of zooplankton	Winter	Spring	Summer	Autumn	Total	Percentage %
Cyclopoida	249	444	186	202	1081	40.7
<b>Harpacticoida</b>	41	66	12	69	188	7.1
Calanoida	-	-	1	-	1	0.04
Nauplii	-	152	22	217	391	14.7
<b>Copepoda</b>	290	662	221	488	1661	62.5
Cladocera	290	30	199	117	636	23.9
<b>Cirripedia nauplii</b>	-	-	5	-	5	0.19
Insecta	-	156	27	5.3	188.3	7.08
Ostracoda	-	5	-	-	5	0.19
Decapoda	-	-	40	-	40	1.5
Zoea	-	2	-	-	2	0.07
<b>Crustacea</b>	580	855	492	610.3	2537.3	95.4
Rotifera	41	30	40	-	111	4.17
Fish larvae	-	3	1	-	4	0.15
<b>Gastropoda</b>	-	-	2	-	2	0.07
<b>Radiolaria</b>	-	2	-	-	2	0.07
<b>Foraminifera</b>	-	2	-	-	2	0.07
<b>Total</b>	621	892	535	610	2658	

**Table (5):** Abundance (ind./m<sup>3</sup>) of various groups of zooplankton at station 5, (Al-Barga region) during the different seasons.

Groups of zooplankton	Winter	Spring	Summer	Autumn	Total	Percentage %
Cyclopoida	237	496	174	5.8	912.8	22.8
<b>Harpacticoida</b>	44	103	23	2.3	172.3	4.3
Calanoida	-	6	0.3	-	6.3	0.16
Nauplii	12	98	62	-	172	4.3
<b>Copepoda</b>	293	703	259.3	8.1	1263.4	31.5
Cladocera	52	69	112	38	271	6.8
Cirripedia nauplii	535	1287	398	1.2	2221.2	55.4
Insecta	2	5	3	-	10	0.25
Ostracoda	-	0.1	-	-	0.1	0.002
Decapoda	-	-	3.2	-	3.2	0.08
Zoea	2	2	3.2	2.9	10.1	0.25
<b>Crustacea</b>	884	2066.1	787.7	50.2	3788	94.5
Rotifera	91	24	36	-	151	3.8
Fish larvae	6	8	3.2	-	17.2	0.4
Radiolaria	2	-	-	-	2	0.05
<b>Foraminifera</b>	20	17	20	1.7	58.7	1.5
<b>Total</b>	1003	2115	838	52	4008	

Whereas at station 6 (Al-Walhan region) the population density of zooplankton was ranged between 178 –2002 ind./ m<sup>3</sup> during Autumn and Spring respectively. Copepoda comprised 49.9%, Cirripedia nauplii 40.6% and Rotifera 4.5% of the total zooplankton (Table 6). While at station 7 (Al- Mashab region) the total zooplankton was ranged between 171 – 1853 ind./ m<sup>3</sup> during Autumn and Spring respectively. It was found that the Copepoda comprised 64.9%, Cirripedia nauplii 21% and

Cladocera 10.3% of the total zooplankton (Table 7).

The average number of the total zooplankton in the marshes ranged between 304 ind./ m<sup>3</sup> at Autumn season to 1935 ind./ m<sup>3</sup> at Spring season (Table 8).

A total of 18 species of Cladocera belonging to 12 genera and 5 family were identified in the study area. Five species were new records in marshes (Table 9).

**Table (6):** Abundance (ind./m<sup>3</sup>) of various groups of zooplankton at station 6, (Al-Walhan region) during the different seasons.

Groups of zooplankton	Winter	Spring	Summer	Autumn	Total	Percentage %
Cyclopoida	702	1022	69	32	1825	43.9
<b>Harpacticoida</b>	9.7	17	4.5	7.6	38.8	0.9
Nauplii	48	152	12	0.8	212.8	5.1
<b>Copepoda</b>	759.7	1191	85.5	40.4	2076.6	49.9
Cladocera	0.4	51	12	34	97.4	2.3
Cirripedia nauplii	547	620	423	100	1690	40.6
Insecta	33	12	-	-	45	1.1
Ostracoda	0.04	-	-	0.4	0.44	0.01
Decapoda	-	6	-	-	6	0.1
Zoea	-	2	1.5	2	5.5	0.1
<b>Crustacea</b>	1340	1882	522	177	3921	94.3
Rotifera	50	110	27	-	187	4.5
Fish larvae	0.3	6	-	-	6.3	0.1
Gastropoda	-	3	-	-	3	0.1
Radiolaria	-	1	-	1.2	2.2	0.05
<b>Foraminifera</b>	-	0.3	39	-	39.3	0.9
<b>Total</b>	1390	2002	588	178	4158	

**Table (7):** Abundance (ind./m<sup>3</sup>) of various groups of zooplankton at station 7, (Al-Mashab region) during the different seasons.

Groups of zooplankton	Winter	Spring	Summer	Autumn	Total	Percentage %
Cyclopoida	1010	825	59	31	1925	53.8
<b>Harpacticoida</b>	21	63	1.3	5.3	90.6	2.5
Calanoida	-	5	-	-	5	0.1
Nauplii	0.6	289	12	1.8	303.4	8.5
<b>Copepoda</b>	1031.6	1182	72.3	38.1	2324	64.9
Cladocera	58	235	54	22	369	10.3
Cirripedia nauplii	159	341	145	106	751	21
Insecta	0.02	8	0.6	-	8.62	0.2
Ostracoda	1.9	-	-	0.6	2.5	0.07
Decapoda	-	6	0.6	1	7.6	0.2
Zoea	0.02	-	-	2.9	2.92	0.08
<b>Crustacea</b>	1250.54	1772	272.5	170.6	3465.6	96.8
Rotifera	23	68	5	-	96	2.7
Fish larvae	-	5	-	-	5	0.1
Gastropoda	-	2	-	-	2	0.05
Radiolaria	-	0.3	-	-	0.3	0.008
<b>Foraminifera</b>	1.9	6	0.6	0.6	9.1	0.2
<b>Total</b>	1275	1853	278	171	3578	

**Table (8):** Abundance (average no./m<sup>3</sup>) and percentage of various group of zooplankton in the marshes during the different seasons.

Groups of zooplankton	Winter	Spring	Summer	Autumn	No./m <sup>3</sup>	Perc. %	No./m <sup>3</sup>	Perc. %
	No./m <sup>3</sup>	Perc. %	No./m <sup>3</sup>	Perc. %				
<b>Copepoda</b>	591	55.5	1427	73.7	148	33.3	133	43.8
<b>Cladocera</b>	80	7.5	72	3.7	70	15.8	33	10.9
<b>Cirripedia nauplii</b>	177	16.6	325	16.8	141	31.8	30	9.7
Insecta	160	15	38	2	17	3.9	105	34.4
Ostracoda	5	0.5	8	0.4	0.6	0.1	0.3	0.09
Zoea	0.4	0.04	1	0.05	1	0.2	1	0.4
Decapoda	3	0.3	2.4	0.1	10	2.3	0.1	0.05
<b>Crustacea</b>	1016	95.4	1873	96.8	388	87.4	302	99.4
Rotifera	34	3.2	51	2.7	46	10.2	-	-
<b>Fish larvae</b>	1.2	0.1	4	0.2	2	0.4	0.4	0.1
<b>Gastropoda</b>	5	0.5	0.7	0.04	0.3	0.06	-	-
Radiolaria	5	0.5	0.5	0.03	0.2	0.04	0.2	0.05
<b>Foraminifera</b>	3	0.3	5	0.2	8	1.9	1	0.4
Total	1064		1935		444		304	

**Table (9):** List of Cladocera species recorded in some stations of South Iraqi marshes (2003 – 2004).

(\*) new record species

No.	List of species	Stations
	Family : Chydoridae Stebbing, 1902	
	Subfamily : Chydorinae Stebbing, 1902	
1-	<i>Chydorus sphaericus</i> Muller, 1776	2, 3, 4, 5, 6
2-	<i>C. barroissi</i> Margalef, 1955	2, 6
3-	<i>Dunhevedia crassa</i> King, 1853*	4, 5, 6, 7
4-	<i>Pleuroxus</i> sp.	4
	Subfamily : Aloninae Frey, 1966	
5-	<i>Alona costata</i> Sars, 1862	5
6-	<i>A. rectangula</i> Sars, 1862	5
7-	<i>A. Affinis</i> Leydig, 1860	5, 6
8-	<i>Camptocercus rectirostris</i> Schoedler, 1862	4, 5, 6
9-	<i>C. Uncinatus</i>	6, 7
	Family : Macrothricidae Norman & Brady, 1867	
10-	<i>Macrothrix rosea</i> Jurine 1820*	1, 2, 3
11-	<i>Ilyocryptus sordidus</i> Lievin, 1848*	3
	Family : Daphniidae Straus, 1820	
12-	<i>M0ina brachiata</i> Jurine, 1820*	7
13-	<i>Simocephalus vetulus</i> Muller, 1776	3, 5, 6, 7
14-	<i>S. expinosus</i> Koch, 1841	5
15-	<i>Scapholebris kingi</i> Sars, 1903	2
	Family : Bosminidae Baird 1845	
	<i>Bosmina longirostris</i> Muller, 1785	6
16-	<i>B. Coregoni</i> Baild 1857	5
17-	Family : Sididae Baird, 1850	
18-	<i>Diaphanosoma brachyurum</i> Lievin 1848*	7

#### 4-Discussion

The results showed that the population density of zooplankton was found to be higher at Spring than in the other seasons. The similar results were also obtained by Al-Saboonchi *et al.* (1986) in Garma marshes, Ajeel (1990) in Khor Al-Zubair and Khor Abdulla, Ajeel *et al.* (2001) in shatt Al-Arab and some temporary ponds in Basrah, Ajeel *et al.* (2003) in Garmat Ali river and Al-Qarooni (2005) in Al-Fuhud marshes. This could possibly be due to higher phytoplankton population concentration in the former season in the shatt Al-Arab river (Hameed 1978), in Garma marshes (Al-Saboonchi *et al.* 1982) and in the marshes near the Qurna (Al-Zubaidi 1985).

In the present study it was found that Crustacea is the most important group of zooplankton in the marshes. The mean value ranged between 87.4% of the total zooplankton at Summer season to 99.4% at Autumn season. The cyclopoid copepods were the cause to increase zooplankton. The mean percent ratio of copepod ranged between 33.3% - 73.7% at summer and spring respectively (Fig 8). These findings are in agreement with Khalaf and Smirnov (1976) which has observed that the Copepoda comprised 26% - 75% at Autumn season in the region between Qurnah and Chibayish.

Whereas Al-Saboonchi *et al.* (1986) who found that the zooplankton population of Garma marshes is dominated by Rotifera which comprised 43.94% - 77.99% at Winter and Spring respectively. While the Copepoda comprised 16% - 55.56% at Autumn and summer respectively. Also Al-Qarooni (2005)

have reported that the Rotifer is the dominated in the marshes (Al-Chibayish, Al-Hammar and Al-Fuhud marshes) which comprised 5.37% - 92.32% during April and September respectively, and the Copepoda comprised 0.43% - 31.22% at January and November respectively.

The present data indicated that the second important group of zooplankton in the marshes is Cirripedia nauplii, which comprised about 9.7% - 31.8% at Autumn and Summer respectively and the mean 18.7%. Whereas the Cladocera comprised 3.7% - 15.8% at spring and summer respectively and the mean 9.5%. However the high percentage of Cladocera at Garma marshes was 35.08% at Winter season (Al-Saboonchi *et al.* 1986). As well as Khalaf and Smirnov (1976) recorded that the Cladocera comprised 18% - 63% at Autumn season between Qurnah and Chibayish.

The relationships of the total zooplankton with water temperature, salinity and hydrogen ion concentration (pH) are given in Table (10). The correlation coefficient appeared a negative relationship between zooplankton density and both water temperature and salinity. Whereas positive relationship obtained hydrogen ion concentration. While Al-Zubaidi and Salman (2001) recorded that the numerical abundance of zooplankton is governed by salinity and freshwater discharge, and to lesser extent by temperature in the Shatt Al-Arab estuary, Northwest Arabian Gulf.

A comparison of total zooplankton abundance estimated in present study with the previous work is difficult, due to differences in collection methods and in the mesh size of the

plankton net used. In addition to errors due to the many factors involved in operating sampling nets, the natural variability of zooplankton, often referred to as patchiness must be responsible for much of the variation in net catches.

The publications used in the present study are historically listed in Table (11) along with their source of samples and sampling duration to provide preliminary idea on the distribution of listed species in the marshes. The cladoceran fauna appears to be reasonably rich and diversified.

**Table(10):** Values of correlation coefficient (r) for the relationship between the numerical abundance of total zooplankton with water temperature, salinity and hydrogen ion concentration (pH), at the sampling stations. The significant value is underlined.

Hydrographic parameters	n	r
Water temp.°C	28	<u>-0.3885</u> , P<0.05
Salinity ‰	28	- 0.1006
pH	28	0.1452

**Table (11):** Available publications concerning Cladocera species composition in the marshes south of Iraq with their source of samples and duration of sampling.

Previous studies	Marshes area	Date
1- Gurney (1921)	A large swamp close to the Tigris between Basrah and Amara	During 1917 and 1918
2- Khalaf <i>et al.</i> 1976	Marshes from Al-Qurnah to Al-Chibayish	18 - 11 - 1974
3- Al-Saboonchi <i>et al.</i> 1986	Garma marshes	From August 1980 to October 1981
4- Al-Qarooni (2005)	Al-Chibayish, Al-Hammar and Al-Fuhud marshes	From September 2003 to August 2004
5- Ajeel <i>et al.</i> (present study)	Al-Hwaiza marshes, Al-Izze river and south of Al-Hammar marshes	From December 2003 to November 2004

Numbers in parenthesis refer to published works in which the species are reported (Table 11).

**Phylum: Arthropoda**

Subphylum: Mandibulata

**Superclass: Crustacea** Pennat 1777

Class: Branchiopoda Calman 1909

**Order: Cladocera** Latreille 1829

Family: Chydoridae Stebbing 1902

**Subfamily: Eurycercinae Kurz, 1875**

1- *Eurycercus glacialis* Lilljeborg 1887 (3)

**Subfamily: Aloninae Frey 1966**

2- *Alona costata* Sars, 1862 (1, 2, 5)

3- *A. affinis* Leydig, 1860 (4, 5)

4- *A. rectangula* Sars, 1862 (1, 4, 5)

5- *A. circumfimbriata* Megard (3)

6- *A. guttata* Sars, 1862 (2)

7- *Indialona macronyx* (3)

8- *Camptocercus uncinatus* (2)

9- *C. rectirostris* Schoedler, 1862 (4, 5)

10- *Oxyurella singalensis* Daday, 1898 (2)

**Subfamily: Chydorinae Stebbing 1902**

11- *Chydorus barroissi* Margalef, 1955 (1, 2, 5)

12- *C. sphaericus* Muller 1776 (2, 3, 4, 5)

13- *C. ventricosus* Daday, 1898 (3)

14- *C. eurytatus* (2)

15- *Dunhevedia crassa* King, 1853 (5)

16- *Pleuroxus* sp. (5)

17- *P. aduncus* Jurine, 1820 (2, 3)

18- *P. similis* Vav67ra, 1900 (3)

19- *P. denticulatus* Birge, 1879 (2)

**Family: Daphniidae Straus 1820**

20- *Simocephalus vetulus* Muller, 1776 (4, 5)

21- *S. expinosus* Koch, 1841 (1, 5)

22- *Scapholeberis kingi* Sars, 1903 (4, 5)

23- *S. mucronata* Muller (1)

24- *Ceriodaphnia cornuta* Sars, 1885 (2)

25- *C. reticulata* Jurine, 1820 (1)

26- *Daphnia lumholtzi* Sars, 1885 (1)

27- *D. longispina* Muller, 1776 (1)

28- *D. dubia* Herrick 1895 (4)

29- *D. magna* Straus, 1820 (4)

30- *D. pulex* Leyding, 1860 (4)

**Family: Moinidae Goulden, 1968**

31- *Moina rectirostris* Leyding 1860 (4)

32- *M. brachiata* Jurine, 1820 (5)

**Family: Sididae Baird, 1850**

33- *Latonopsis occidentalis* Birge 1891 (4)

34- *Diaphanosoma brachyurum* Lieven 1848 (5)

**Family: Macrothricidae Norman & Brady 1867**

35- <i>Ilyocryptus sordidus</i> Lievin, 1848	(5)
36- <i>I. Spinifer</i> Herrick, 1882	(2)
37- <i>Macrothrix</i> sp.	(4)
38- <i>M. spinosa</i> King, 1853	(2)
39- <i>M. rosea</i> Jurine 1820	(5)
40- <i>Echinisca rosea</i>	(2)

**Family: Bosminidae Baird 1845**

41- <i>Bosmina longirostris</i> Muller, 1785	(1 , 4)
42- <i>B.coregoni</i> Baird 1857	(4)

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Total number of genera	19
Total number of species	42

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## توزيع الهائمات الحيوانية في هور الحويزة وهور الحمار ونهر العز جنوب العراق

شاكراً غالب عجيل وطالب عباس خلف وهناء حسين محمد ومحمد فارس عباس  
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### الملخص

جمعت عينات الهائمات الحيوانية فصلياً من سبعة محطات في الأهوار جنوب العراق خلال الفترة من كانون الأول 2003 إلى تشرين الثاني 2004 ، بواسطة شبكة الهائمات 120 مايكرون. تراوحت كثافة الهائمات الحيوانية بين 52 فرد/م<sup>3</sup> في المحطة 5 (منطقة البركة جنوب هور الحمار) خلال فصل الصيف إلى 3309 فرد/م<sup>3</sup> في المحطة 2 (منطقة الترابية في هور الحويزة) خلال فصل الربيع. وكانت القشريات هي السائدة في جميع المحطات بسبب وفرة مجدافية الأقدام والتي بلغت نسبتها 62.4%، 67%، 89.9%، 62.5%، 31.5%، 49.9%، 64.9% من مجموع الهائمات الحيوانية في المحطات على التوالي. كثافة الهائمات الحيوانية في محطات الدراسة كانت مرتبطة عكسياً مع درجة حرارة الماء وبدرجة أقل مع الملوحة. تم تسجيل 18 نوع من متفرعة اللوامس تعود إلى 12 جنساً في محطات الدراسة، 5 منها لأول مرة تسجل في الأهوار.