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First record of Cyprideis torosa (Jones, 1850) (Crustacea: Ostracoda) in the East of Al-Hammar Marshes, Southern Iraq

Mohammed G. Khalifa[1*] and iD Shaker G. Ajeel[2]
1-Dept. Biology, College of Science, University of Basrah, IRAQ
2- Marine Science Centre, University of Basrah, IRAQ
*Corresponding Author: e-mail: *mohammedpolskie@gmail.com*

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Abstract - Cyprideis torosa is recorded for the first time in east Al-Hammar marshes and it was collected from three stations (Al-Sallal, Al-Nagara and Al-Mas'hab) in east of Al-Hammar marshes between January and December 2021. The ecological parameters measured were water temperature, dissolved oxygen, pH, conductivity, salinity and turbidity and were related to the presence or absence of the species in question.

اول تسجيل للنوع Cyprideis torosa (Jones,1850) (القشريات، الدرعيات) في هور شرق الحمار، جنوب العراق

محمد غازي خلف[1] وشاكر غالب عجيل[2]
1- قسم علوم الحياة، كلية العلوم ، جامعة البصرة ، 2- مركز علوم البحار، جامعة البصرة، العراق

المستخلص - سجل النوع Cyprideis torosa لأول مرة في هور شرق الحمار الذي ينتمي الى جنس Cyprideis حيث جمع هذا النوع من ثلاث محطات (الصلال، النكارة، المسحب) في هور شرق الحمار للفترة من كانون الثاني ولغاية كانون الأول 2021 وتم تصنيفه، وقيست عدة عوامل بيئية مثل درجة حرارة الماء، درجة الحموضة، الأوكسجين الذائب، التوصيلية الكهربائية، العكورة، والملوحة.

الكلمات المفتاحية: الدرعيات، Cyprideis، تسجيل لأول مرة، هور شرق الحمار

Introduction

Generally, Ostracoda can be found in most types of water including fresh, brackish, and saline waters. Because they are sensitive to the changes in the aquatic environment, ostracods are used as indicators of physical and chemical conditions, for example seasonal variations in water temperature may affect their distribution, life span, and abundance (Kykoylnoglo and Vineyard, 1988). Although ostracods are important in both biological and paleontological studies, previous studies indicate high and unique species richness and biogeographic distributions of specific composition of the fauna freshwater of Ostracoda.

Cyprideis occurs from fresh to marine waters with fluctuating salinity, it prefers a muddy or sandy muddy substrate but is also found on pure sand and algae. (Frenzel, 1991). It is found in a wide range of salinities from almost freshwater to fully marine water. It is a very variable species, some bear nodes on their carapace and some are without nodes (Karanovic, 2012). There are two opinions regarding the cause of the nodes, one is that this is genetically influenced, and the second, claims that this is due to the influence of the changes in salinity that the Cyprideis torosa appears

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bearing nodes in reduced salinity values (Aladdin, 1993). It has its greatest development at salinities of 2 -16.5% (Wagner, 1964).

Recent studies indicate that there is some relationship between species presence / absence and both physical and ecological factors (Baltanas *et al.,* 1990). Individuals, generally eggs can be carried passively by some insects (Fryer, 1953), snails (Sohan and Kornicker, 1979), amphibians (Seidel, 1989), fish (Vinyard, 1979), birds (Scharf, 1988) and waterfowl (De Deckker, 1983). Additionally, Ostracoda can expand their distribution actively by swimming. There are no studies on Ostracoda in the east of Al-Hammar marshes and this is the first study on this group in this region. The purpose of the present preliminary study was to identify and investigate the ecology of freshwater ostracods by examining their relationships with selected parameters in Al-Hammar marshes

Study area

The study was conducted in eastern Al-Hammar marsh, which is located in the southern part of the Euphrates River in Iraq. This marsh extends from Suq Al-Shuyoukh town in Dhi Qar governorate to Basra governorates, its length is 90 km, its width is 25-30 km, and its depth is 3m (Salman *et al.,* 2014), (Fig. 1). This marsh is affected by the semidiurnal tides of the Arabian Gulf through the Shatt Al-Arab River, where a large mass of water enters this marsh (Hussain *et al.,* 2007).

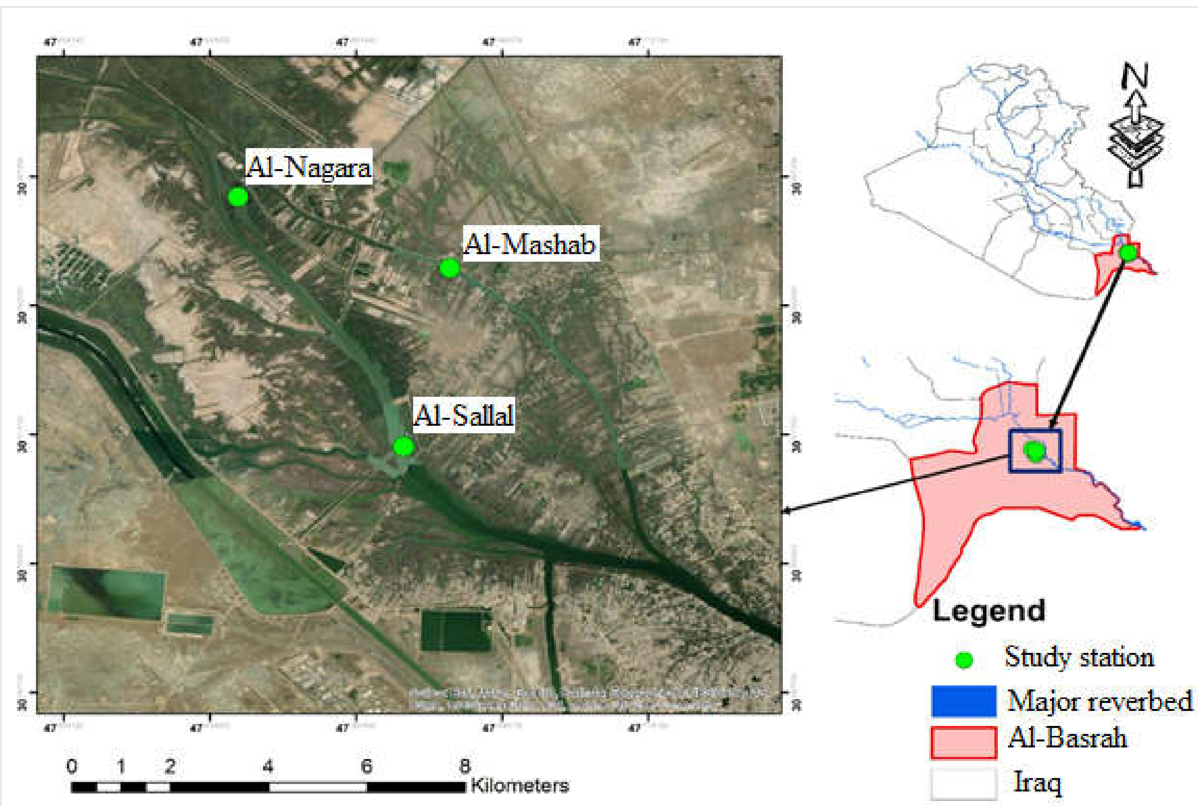

Figure 1. Map of lower Mesopotamia showing the sampling stations

Materials and Methods

Samples were collected from the bottom sediment s of three stations, Al-Sallal, (30°62′377″N 47°66′799″E), Al-Nagara, (30°68′051″N 47°62′658″E) and Al-Mas'hab stations (30°64′273″N 47°68′997″E) using a grape sampler from several points in each station, then the sample was washed with station water from the same station through zooplankton net to reduce the size of sediments, then the water was filtered and placed in a plastic bottle with a capacity of 500 ml and fixed by adding 4% Formalin. As for the rest of the sediment sample, it was placed in a plastic container filled with water and the container was closed, and transferred to the laboratory. In the laboratory, the species were separated from other Materials by zooplankton net (1mm mesh sizes). Under pressurized tap water, valve s were then separated from the soft body, which was also dissected, Species were identified based on both soft body parts and valve morphology (Meisch, 2000). Examination of the species was done under a microscope, Humascope type.

Environmental parameters water temperature, pH, salinity, dissolved oxygen, turbidity and conductivity were measured some of them in the field and the others in the laboratories of the Marine Science Center, university of Basrah.

Results

Taxonomy

For the identification of the species, the systematic key of Meisch (2000) and Karanovic (2012) were followed.

Phylum: Arthropoda
Subphylum: Crustacea (Pennants, 1777)
Class: Ostracoda (Latreille, 1806)
Order: Podocopida (Sars, 1866)
Superfamily: Cytheroidea (Baird, 1850)
Family: Cytherdeida (Sars, 1925)
Subfamily: Cytherideinae (Sars, 1925)
Genus: Cyprideis (Jones, 1850)
Cyprideis torosa (Jones, 1850)

Cyprideis torosa is recorded for the first time in the east of Al-Hammar marshes, it was collected from three stations (Al-Sallal, Al-Nagara, Al-Mas'hab) in east Al-Hammar marshes between January and December 2021.

Description

Female, carapace is semi ovate in lateral view, ventral margin almost straight, carapace posteriorly inflated because of the presence of a brood pouch, valves variable pitted and almost smooth, sometimes with three well developed tubercles (nodes), (Fig. 2) Dorsomedian groove (sulcus) weak. Right valve with a posterior ventral spine. (Fig. 3,5). Male, carapace slightly longer than that of the female, more elongated in lateral view not inflated posteriorly in dorsal view. Walking legs symmetrically developed. The size of the female is 0.9 mm while that of the male is 1mm. (Fig. 4). Antennae have only two terminal claws. The three walking legs are individually recognized by the following characters: the first thoracic leg is the shortest and has two knee-set, the second thoracic leg is of medium-length the basal posterior setae is strongly developed and setae are relatively short, only slightly longer than the penultimate segment, the third thoracic leg is the longest, the posterior setae is thin and setae reaches beyond the distal end of the terminal segment.

Figure (2): Cyprideis torosa, with nodes

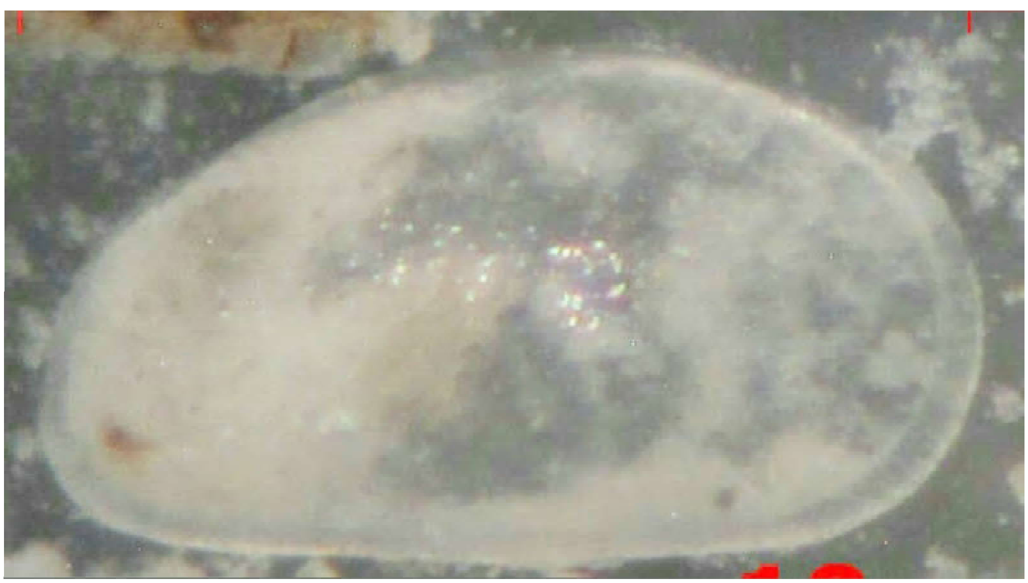

Figure (3): Cyprideis torosa (Jones, 1850), Female

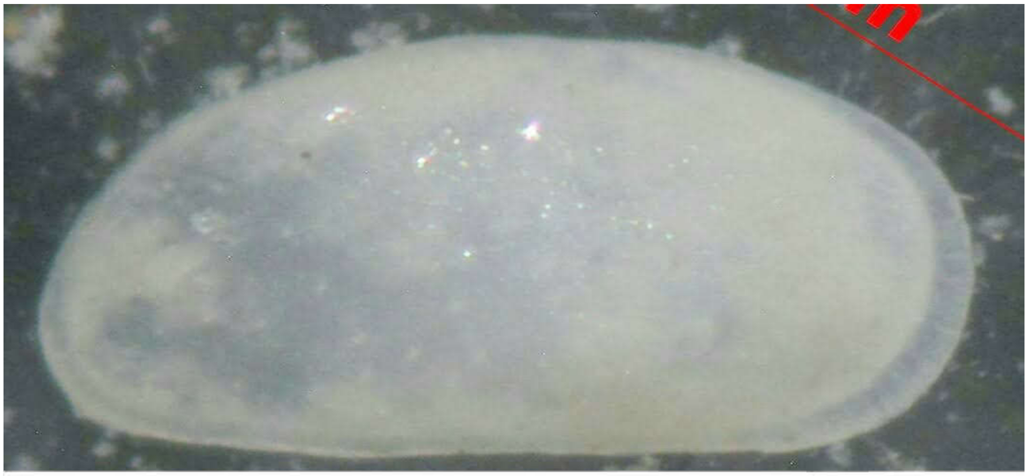

Figure (4): Cyprideis torosa (Jones, 1850), Male

Figure (5): Cyprideis torosa, internal view of the Left valve

Ecology and distribution:

Discussion

The East of Al-Hammar Marshes witnessed an unprecedented rise in salinity ratio as a result of the incursion of the salty water front coming from the Arabian Gulf through the Shatt Al-Arab River and a decrease in the flows of the Tigris River and the interruption of the waters of the Euphrates River, which directly or indirectly affected the communities of biota in general and Ostracoda in particular. The biological and abiotic environmental factors negatively or positively affected the abundance and distribution of Ostracoda in the eastern Al-Hammar marshes. It is important to note that the Ostracoda species which were recorded in the eastern Al-Hammar marshes during the current study was found in the sediments.

The present study was conducted between January to December 2021, and the results reveal that some environmental factors affect the presence and density of Cyprideis torosa. The water temperature and pH were measured in the field by a portable pH meter digital, while salinity was measured by digital, salinometer turbidity by turbidity meter, and conductivity by multimeter, while dissolved oxygen was measured by the Strickland and Parsons (1972) method.

The water temperature was ranging between 33.53 °C in summer and 15.43 °C in winter, (Fig. 6) while the pH was between 7.58 in summer and 8.8 in autumn (Fig. 7). The salinity value was between 1.97 ppt in autumn and 4.26 ppt in winter (Fig. 8)., while the turbidity ranged from 11.86 NTU in summer to 62.64 NTU in spring (Fig. 9). The lowest conductivity value was 3.52 mi.c./cm in autumn and the highest value was 7.2 mi.c./cm in winter (Fig. 10), while the total dissolved oxygen value was ranging between 4.18 mg/l in summer and 9.95 mg/l in winter (Fig. 11).

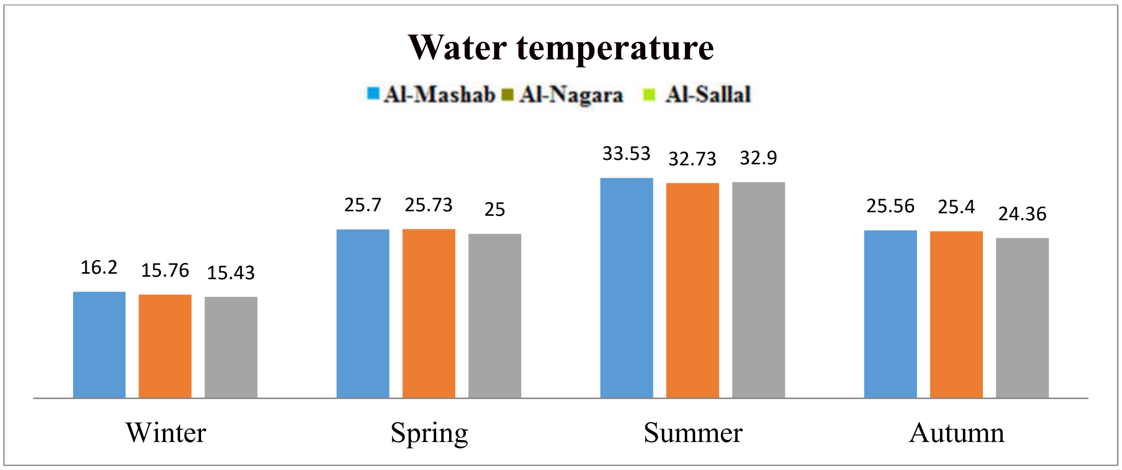

Figure (6): Seasonal changes in water temperature values

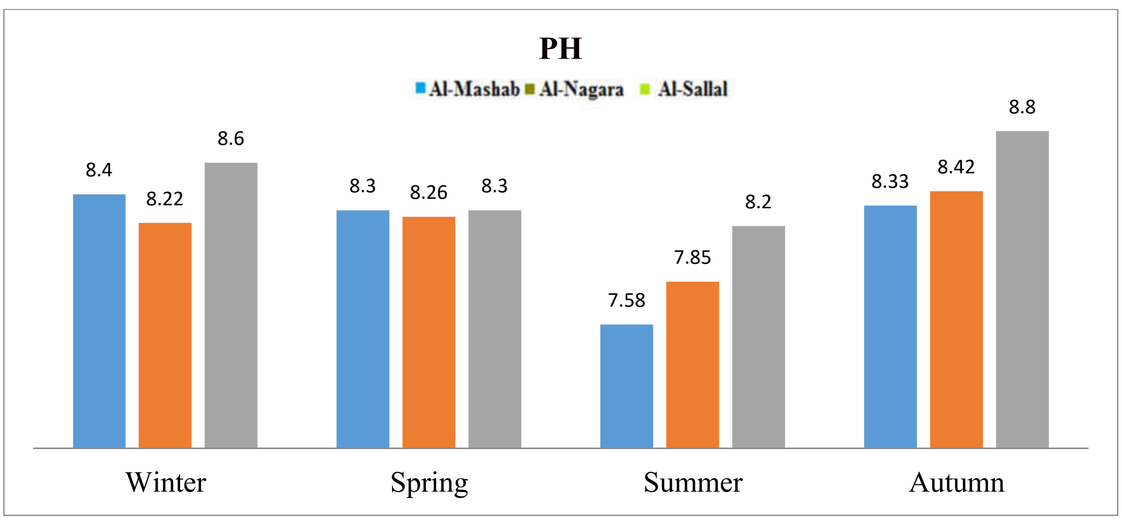

Figure (7): Seasonal changes in pH values

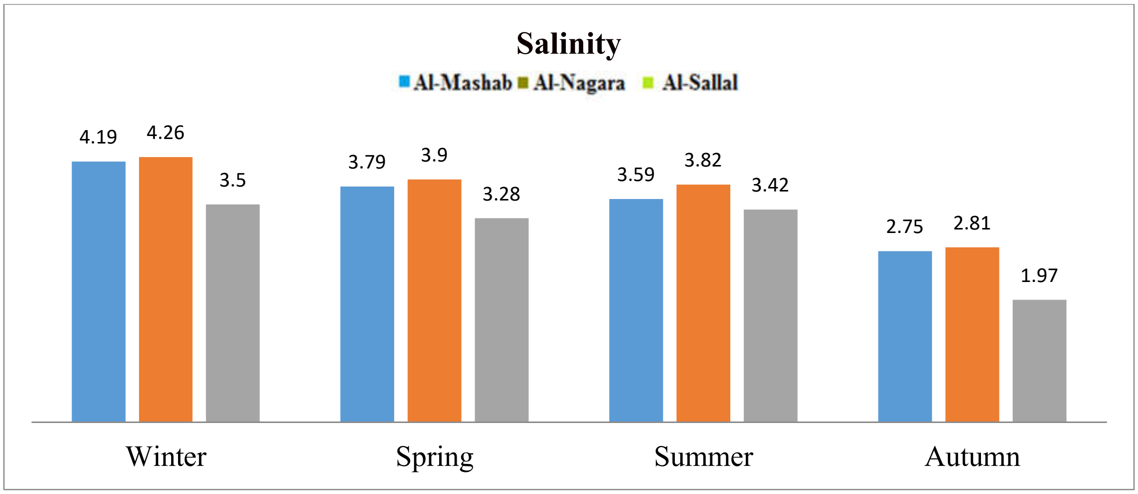

Figure (8): Seasonal changes in salinity values

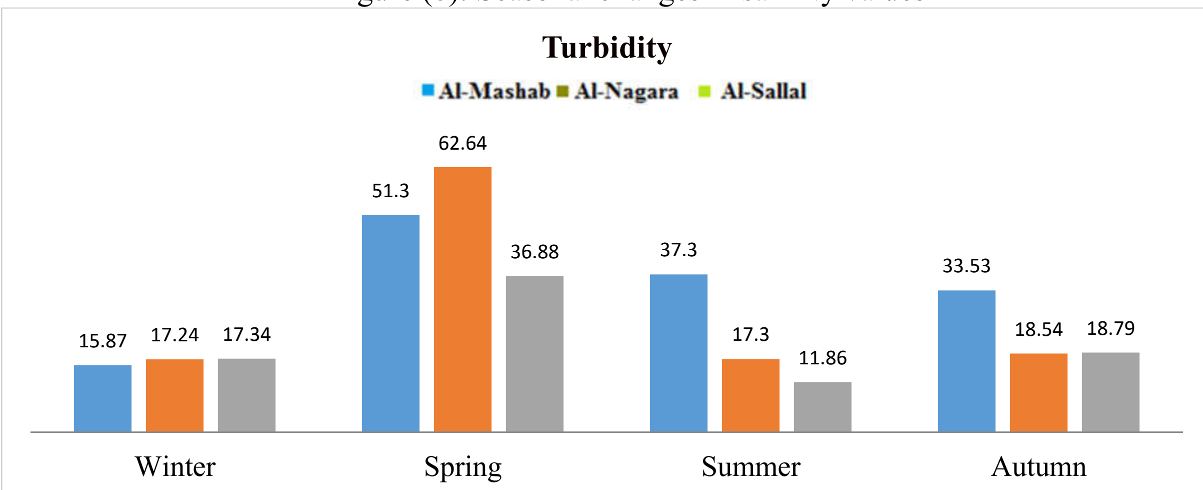

Figure (9): Seasonal changes in turbidity values

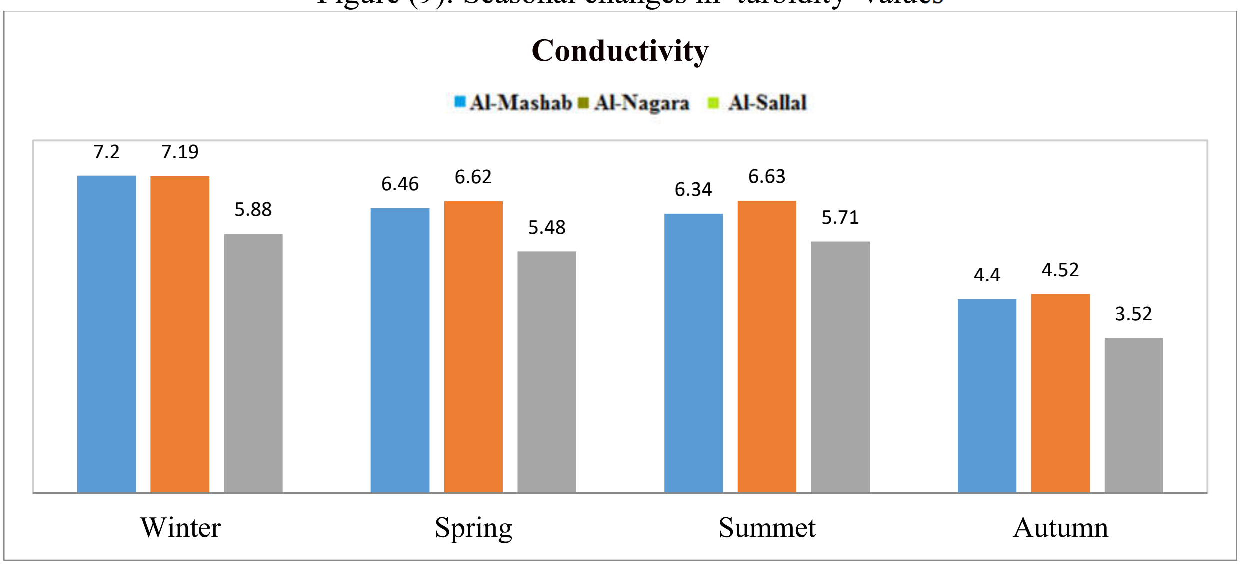

Figure (10): Seasonal changes in conductivity values

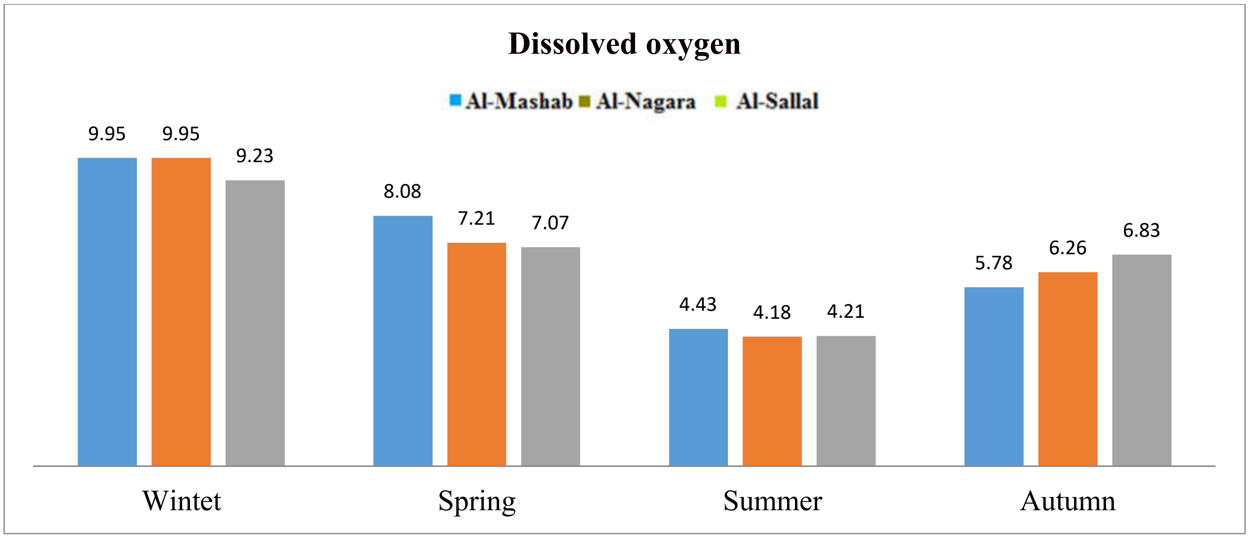

Figure (11): Seasonal changes in dissolved oxygen values

Monthly changes in density of Cyprideis torosa

The monthly density of C. torosa in Al-Sallal station was between 32 ind./m2 (February) and 1555 ind./m2 (June). while in Al-Nagara station it was between 16 ind./m2 (February) and 515 ind./m2 (December), and it was in Al-Mas'hab station between 12 ind./m2 (February) and 503 ind./m2 (December) (Table 1).

The total annual density of C. torosa in the sediments was 7544 ind./m2 in Al-Sallal, while it was 2730 ind./m2 in Al-Nagara station, and 2423 ind/m2 in Al-Mas'hab station (Table 1 and Fig. 12)

Tables (1) Monthly density of Cyprideis torosa in studies stations

Month	Al-Sallal	Al-Nagara	Al-Mas'hab
January	282	153	76
February	32	16	12
March	580	224	141
April	867	87	212
May	532	416	270
June	1555	48	147
July	187	161	118
August	350	189	433
September	580	243	133
October	410	255	211
November	673	423	167
December	1496	515	503
Total	7544	2730	2423

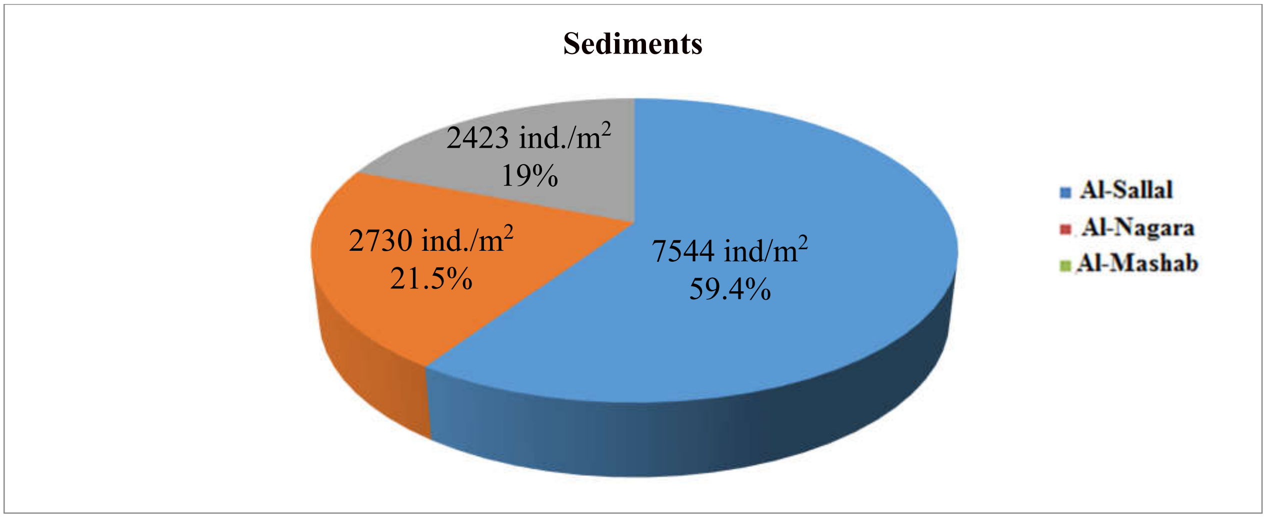

Figure (12): Annual density and percentage of Cyprideis torosa at the three stations of east Al-Hammar Marshes

The seasonal changes at Al-Sallal station showed that the Spring and Autumn were the highest seasons of the year in numbers of Cyprideis torosa (Fig. 13), while at Al-Nagara station, autumn was the highest season of the year in numbers of Cyprideis torosa, and at Al-Mas'hab station summer was the highest season of the year in numbers of Cyprideis torosa (Fig. 13,14,15). Whereas the lowest numbers were recorded at Al-Sallal station in winter (Fig. 13), and at Al-Nagara station in summer (Fig.1 4) and at Al-Mas'hab station in autumn (Fig. 15).

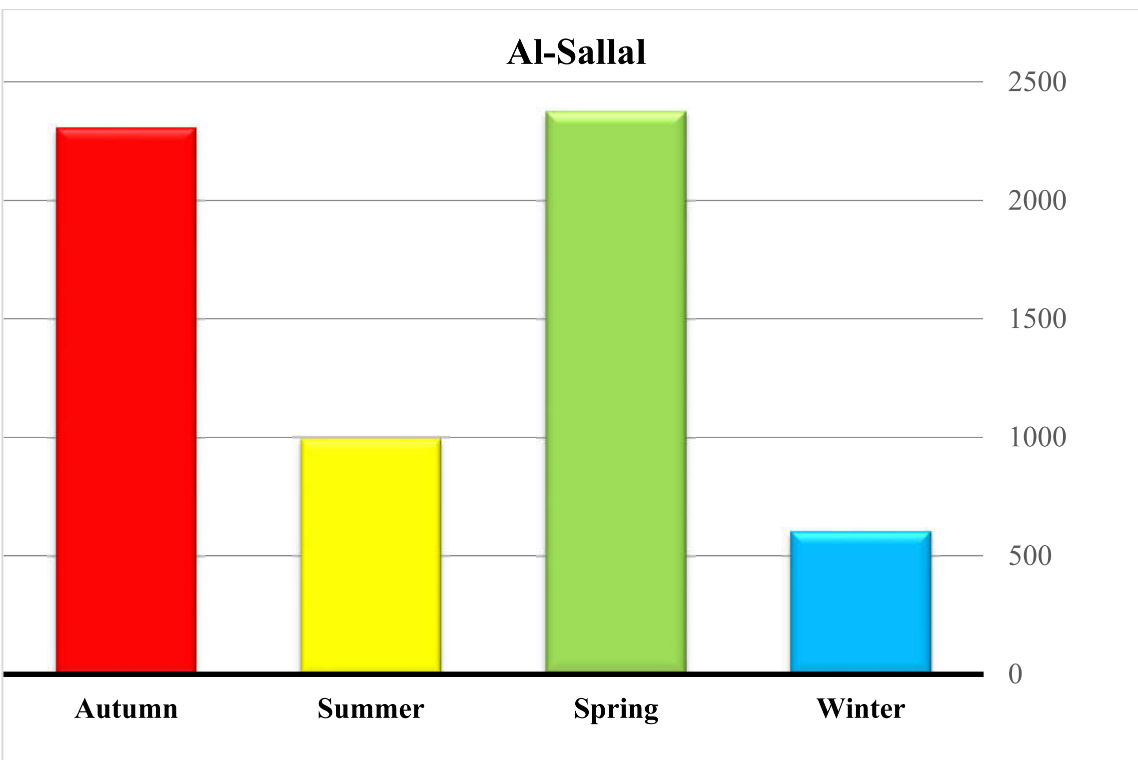

Figure (13): Seasonal changes of numbers of *Cyprideis torosa* in Al-Sallal station

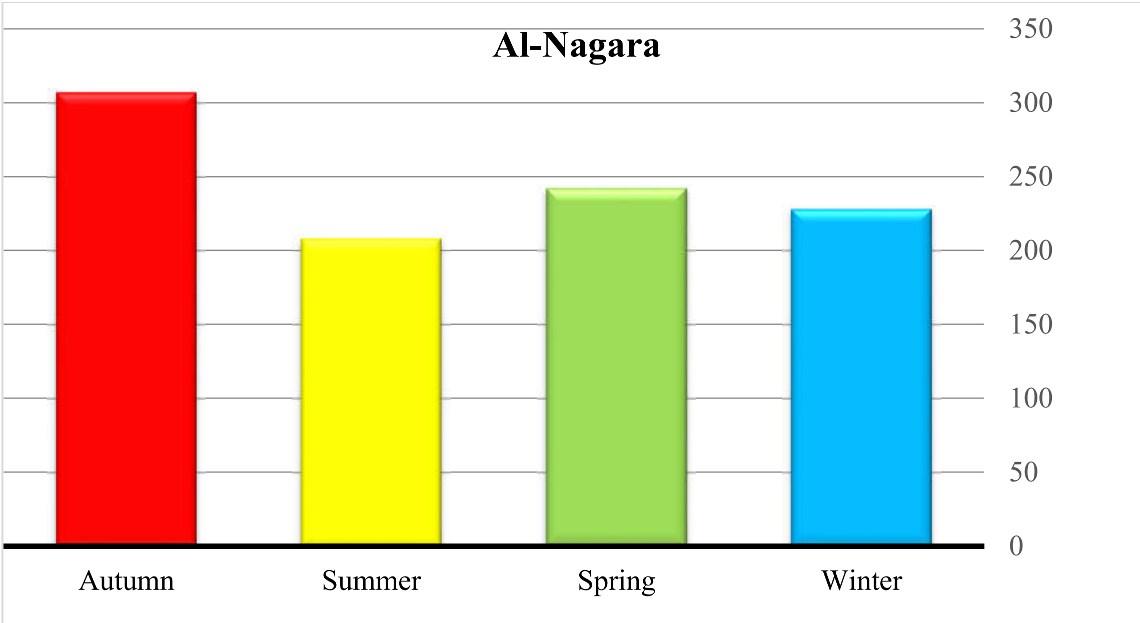

Figure (14): Seasonal changes of numbers of Cyprideis *torosa* in Al-Nagara station

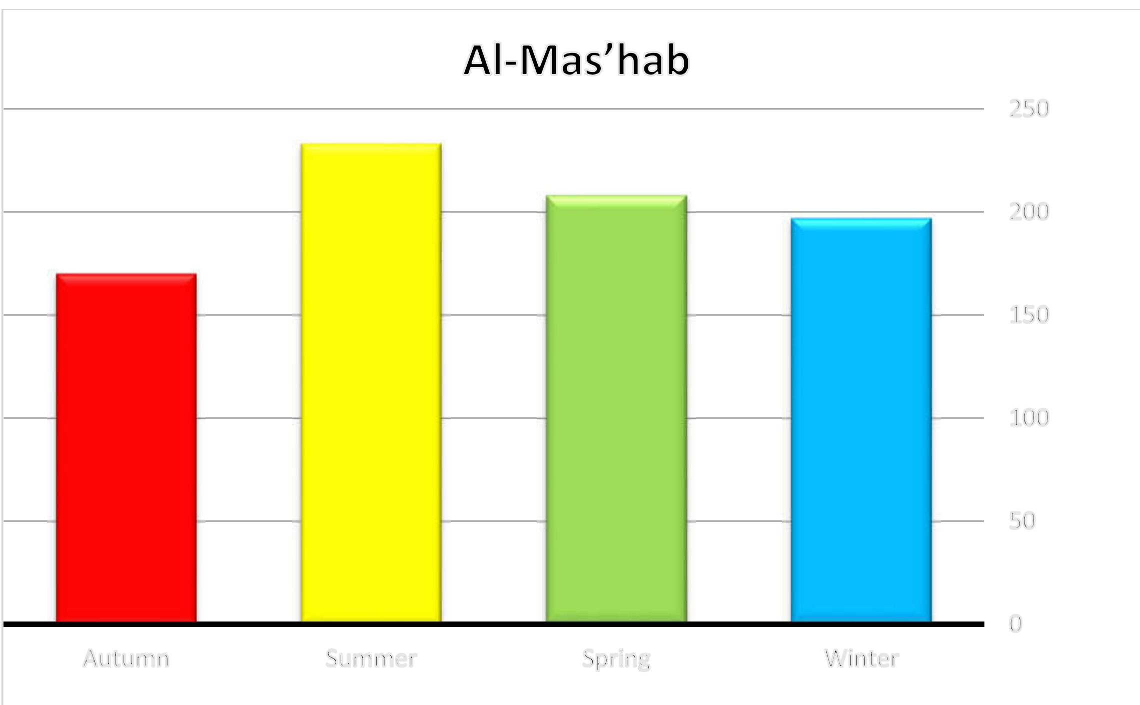

Figure (15): Seasonal changes of numbers of *Cyprideis torosa* in Al-Mas'hab station

Conclusions:

1. The highest density of *Cyprideis torosa* was recorded in Al-Sallal station and the lowest density was recorded in Al-Mas'hab station.
2. The East Al-Hammar Marshes witnessed an unprecedented increase in the concentration of salinity as a result of the incursion of the salty marine waters coming from the Arabian Gulf through the Shatt Al-Arab River as a result of decrease in discharges of the Tigris River and interruption of waters of the Euphrates River, which directly or indirectly affect the communities of living organisms in general and the Ostracoda in particular.

References

Aladdin, N.V. 1993. Salinity tolerance morphology and physiology of the osmoregulation organs in Ostracoda with special reference to Ostracoda from the Aral sea, A.A. Balkema, Rotterdam, 387 - 404 p.URL

Baird, W. 1850. Description of several new species of Entomostraca. Ann Nat Hist, ser 2 10:56–59.URL

Baltanas, A.; Montes, C. and Martini, P. 1990. Distribution patterns of Ostracoda Nigerian saline lakes, Influence of ecological factors. Hydrobiologia, 197: 207-220. https://doi.org/10.1007/BF00026951

De Deckker P. 1983. Terrestrial Ostracods in Australia. In: Lowry JK. (ed) Papers from the conference on the biology and evolution of Crustacea. Aust. Mus. Mem. 18: 87–100.URL

Frenzel, P. 1991. Die Ostracoden Fauna der tieferen Tells der ostsee-Boddengewlisser Vorpommerns Meyniana 43: 151-175.URL

Fryer, G. 1953. The Freshwater Crustacea of Yorkshire, A Faunistic and Ecological Survey-Yorkshire Naturalists, union and Leeds philosophical and Literary Society.312pages.

Hussain, N.A.; Abdullah, S.S. and Al-Mahdi, A.A. 2007. Some features of the physical oceanography in Iraqi marine waters. Mesopotamian J. Mar. Sci., 22, (2): 209 - 222.URL

Jones, T.R. 1850. Description of the Entomostraca of the pleistocene beds of Newbury, copford, clcton, and Grays. Ann. Mag. Nat. H, st, Ser, 26: 25-28.

Karanovic, I. 2012. Recent freshwater Ostracods of the world. Springer-Verlag Berlin Heidelberg, .619 p. https://doi.org/10.1007/978-3-642-21810-1

Klie, W.1938. Ostracoden aus unteridischen Gewlassern in Sluditalien. Zool 123: 147-115.

Kykoylnoglo, O. and Vineyard, G.I. 1988 . New bisexual form of cavernocypris subterranca, Ostracoa, from Idaho -Great Basin Naturalist, 58(4): 380-385.

Latreille, P.A., 1806 . Genera crustaceorum et insectorum secundum ordinem naturalem in familia disposita, iconibus exemplisque plurimis explicata. Paris et Argentorati 1, 302.URL

Meisch, C. 2000. Freshwater Ostracoda of western and central Europe. Susswasser fauna von Mitteleuropa 8/3 spectrum Akad vlog, Gustav Fischer, Heidelberg, Berlin,1-522 pp.

Salman, D.; Abbas, M.F.; Ghazi, A.H.H.; Ahmed, H.K.; Akash, A.N.; Doubly, A.A.; Warner, B.G. and Asada, T. 2014. Seasonal changes in zooplankton communities in the reflooded Mesopotamia Wetlands, Iraq. Journal of freshwater Ecology. 29(3): 397 - 412. https://doi.org/10.1080/02705060.2014.907547

Sars, G.O. 1866. Oversigt af Borges marine Ostracoden. Forth Vidensk-Selsk Christian 2865: 1-130.

Sars, G.O. 1925. An account of the Crustacea of Norway with short descriptions and figures of all Museum, Bergen,73-208 pp.

Scharf, B.W. 1988. Living Ostracods from the Nature Reserve Hordter Rheinaue (Germany). 501-516. https://doi.org/10.1016/S0920-5446(08)70204-8

Sohan, I.G. and Kornicker, L.S. 1979. Viability of freeze dried eggs of the freshwater Hetero Cypris incongruens. Belgrade: 1-4.

Strickland, J.D.H. and Parsons, T,R. 1972.A practical Handbook of seawater Analysis fisheries research board of Canada Ottawa. 310 pp. URL

Vinyard, G. 1979. An Ostracoda, Cypridopsis vidua can reduce predation from fish by resisting digestion. Am. Mild. Nat.102: 108-190. https://doi.org/10.2307/2425084

Wagner, C.W. 1964 Ostracods as environmental indicators in recent and holocene estuarine deposits of the Netherlands. – Pubblicazioni della Stazione Zoologica di Napoli 33: 480-495.