

The Plankton Fauna of the Northern Lagoony System of Izmir Bay

İlker Pulat¹, İsmet Özel²

¹ Celal Bayar Üniversitesi, Fen Fakültesi, Biyoloji Bölümü, Manisa
² Ege Üniversitesi, Su Ürünleri Fakültesi, Temel Bilimler Bölümü, İzmir

Özet: *İzmir Körfezi kuzey lagüner sistemi plankton faunası.* İzmir Körfezi'nin kuzeyinde 11 istasyondan mevsimsel zooplankton örnekleri toplanmıştır. 36 zooplankton taxa saptanmış, kopepodlar 27 tür ile baskın gruptur. Meroplanktonik formlar grup düzeyinde saptanmıştır. Homa Dalyanına yakın kısımlar zooplankton tür çeşitliliği ve yoğunluğu bakımından çok zengindir. *Acartia clausi* tüm istasyonlarda en yaygın kopepod türü olarak bulunmuştur.

Anahtar Kelimeler: İzmir Körfezi, Homa Dalyanı, Zooplankton.

Abstract: Zooplankton samples were collected seasonally from 11 stations located in the northern part of İzmir Bay. 36 zooplankton taxa were identified, copepods were dominated with 27 species. Meroplanktonic forms in the samples were determined on group level. The area close to Homa Lagoon was found to be very rich based on zooplankton variety and density. *Acartia clausi* was found to be the most common copepod species among all stations.

Key Words: Izmir Bay, Homa Lagoon, Zooplankton.

Introduction

Lagoons are very rich with nutritional elements. So, they are highly rich in primary productivity and also zooplankton. For this reason, many organisms prefer lagoons. Various fish species and many other organisms live, develop, and spend at least one of their life cycles in lagoons. This is one of the most important characteristics of the lagoons. Because this factor increases fish productivity in the area and make it economically valuable.

There are about 80 lagoons in Turkish coasts. Homa lagoon is one of the most important lagoons in the Aegean coast of Turkey. In the study area, Gediz Delta, there are four lagoons: Kırdeniz, Homa, Çilazmak, and Tas Lagoons. Due to its typical lagoon characteristics that mentioned earlier, Gediz Delta is of

paramount importance. There are many studies on the zooplankton of Izmir Bay (Ergen, 1967; Özel, 1977 and 1979; Özel and Aker, 2001). Moreover, some projects such as Izmir Bay Monitoring Projects have been performed. However, the majority of the studies in Homa Lagoon were related to fisheries (Kinacıgil *et al.*, 1991; Özden *et al.*, 1991; Hossucu and Ak, 2000). As far as fisheries, there are also some studies on phytoplankton and macrobenthos (Cirik *et al.*, 1991; Önen and Yaramaz, 1997).

Materials and Methods

Zooplankton samples were collected seasonally from 11 stations located in the northern part of Izmir Bay during February 1998 and February 1998 (Figure 1). Temperature and salinity parameters of the surface water of stations were also

measured in the field. Due to shallow water characteristics of the study area, a special zooplankton collector was designed and used for the sampling operations. The net was 27 cm in diameter, 100 cm long, and 200 size micron in mesh. This net allowed us to

take horizontal samples in the shallow waters. Zooplankton samples were kept in jars containing 4% seawater formaldehyde solution. Olympus stereomicroscope and compound microscope were used to identify zooplankton specimens.

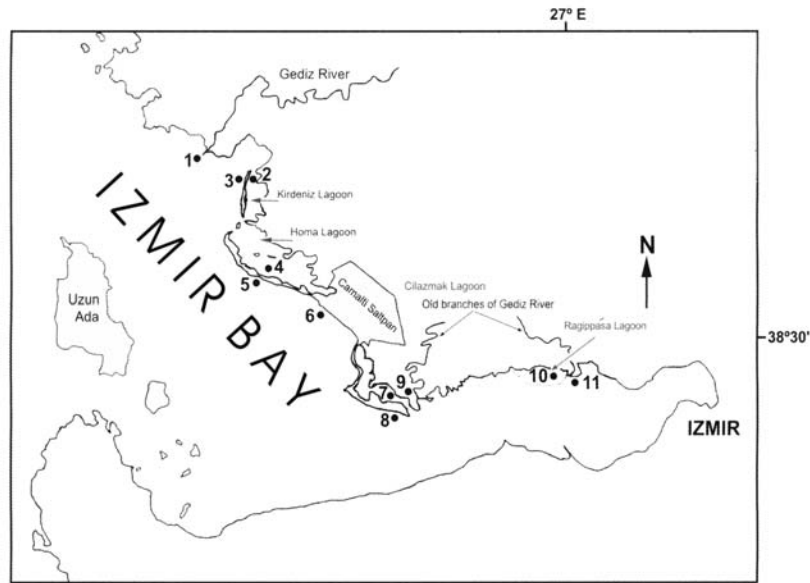


Figure 1. The sampling stations in Izmir Bay.

Results

Temperature and salinity values greatly varied in the stations seasonally.

Temperature values ranged from 9.5°C to 30.6°C. Salinity values fluctuated in the shallow lagoons and station 1, which is affected by Gediz River (Table 1).

Table 1. Values of some physico-chemical parameters in each sampling station.

Months	Stations	1	2	3	4	5	6	7	8	9	10	11
February	Temp.°C	12.5	12	18	8	11.5	11	13	13	15	14	13
	Sal. (‰)	23.4	24.6	26.6	24.3	27.5	27.2	28.7	26.6	19	26.3	26.9
	D.O ₂ (mg/t)	6	7.6	8.5	8.2	8	8.5	7	8	6.5	5	5
May	Temp.°C	23.5	23	19	21	22	22	21	21	21.5	20.5	21.5
	Sal. (‰)	23.4	31.3	34.5	36.3	34.5	35.7	36.3	36.3	27.8	25.4	25
	D.O ₂ (mg/t)	5	7.2	14	8.4	7.6	6.4	6.2	6.2	5.4	7.4	4.8
August	Temp.°C	27	25	25.5	29	24.5	26	31	28	28	27	29
	Sal. (‰)	36.3	38.2	38.1	42.8	38.7	38.5	38.1	38.8	38.6	33.3	21.0
	D.O ₂ (mg/t)	7.4	6	11.2	10.4	6.4	7.2	10.4	8.4	7.2	8.4	10.8
November	Temp.°C	18	14	15	17	18	14	18	17.5	16.5	11.5	16
	Sal. (‰)	17.6	31	31	31.4	33.9	33.9	31.6	28.1	30.4	29.8	29.3
	D.O ₂ (mg/t)	6	8.8	8	7.2	6.8	6.8	7.2	8	2.8	5.6	7.6

36 zooplankton taxa were identified, most of them down to species or genus level, some at higher levels. 27 pelagic copepod species, 6 Cladoceran species, 2 pelagic tunicate species, and 1 Chaetognath species were identified (Table 2).

Meroplanktonic forms in the samples were determined on group level. Distribution of identified holoplanktonic and meroplanktonic species and groups are given in Table 2, and 3.

Table 2. List of zooplankton found, and their presence at each station.

HOLOPLANKTON	STATIONS										
	1	2	3	4	5	6	7	8	9	10	11
Foraminifera	-	+	+	-	-	+	+	-	+	+	-
Siphonophora	-	-	-	-	+	+	-	+	-	-	-
Hydromedusae	-	-	-	-	-	-	-	+	-	-	+
Cladocera											
<i>Penilia avirostris</i>	-	-	-	+	+	+	-	+	+	-	+
<i>Podon intermedius</i>	-	-	-	-	+	-	-	+	-	-	+
<i>P. polyphemoides</i>	+	-	+	+	+	+	-	+	-	-	+
<i>Evadne nordmanni</i>	+	-	-	-	+	+	-	+	-	-	+
<i>E. tergestina</i>	+	-	+	-	+	+	-	+	-	+	+
<i>E. spinifera</i>	-	-	-	-	+	-	-	+	-	-	+
Copepoda											
<i>Mecynocera clausi</i>	-	-	-	-	+	-	-	+	-	-	+
<i>Paracalanus parvus</i>	+	-	+	+	+	+	-	+	+	+	+
<i>Calocalanus pavo</i>	-	-	-	-	+	-	-	-	-	-	-
<i>Clausocalanus arcuicornis</i>	-	-	-	-	-	-	-	+	-	-	-
<i>C. furcatus</i>	-	-	-	-	-	-	-	+	-	-	-
<i>Ctenocalanus vanus</i>	-	-	-	-	+	-	-	+	-	-	-
<i>Scolecithrix</i> sp.	+	+	-	-	+	-	-	-	-	-	-
<i>Temora stylifera</i>	+	-	+	-	+	+	-	+	-	-	+
<i>Centropages typicus</i>	-	-	-	-	+	-	-	-	-	-	-
<i>C. kroyeri</i>	+	-	+	+	+	+	-	+	-	-	+
<i>Isias clavipes</i>	+	-	-	-	+	-	-	-	-	-	-
<i>Haloptilus longicornis</i>	-	-	-	-	+	-	-	-	-	-	-
<i>Labidocera brunescens</i>	+	+	-	-	+	+	-	+	+	-	+
<i>Acartia clausi</i>	+	+	+	+	+	+	+	+	+	+	+
<i>A. latisetosa</i>	+	-	+	-	+	+	-	+	+	+	+
<i>Acartia</i> sp.	+	-	-	+	-	+	-	+	+	-	+
<i>Calanipeda aquae-dulcis</i>	+	+	+	+	+	+	+	+	+	-	-
<i>Oithona helgolandica</i>	+	+	+	+	+	+	+	+	+	-	+
<i>O.nana</i>	+	+	+	+	+	+	+	+	-	+	-
<i>O. plumifera</i>	-	-	-	-	+	+	-	+	-	-	+
<i>Oncaea</i> sp.	-	+	-	+	+	-	+	+	-	+	+
<i>Corycaeus</i> sp.	+	+	+	-	+	+	-	+	-	-	-
<i>Corycella</i> sp.	-	-	-	-	-	-	-	+	-	-	-
<i>Euterpina acutifrons</i>	+	+	+	-	+	-	-	-	-	-	+
<i>Clytemnestra rostrata</i>	-	-	-	-	-	+	-	-	-	-	-
<i>Monstrilla</i> sp.	+	-	-	-	+	+	-	-	-	-	-
<i>Cymbasoma</i> sp.	-	-	-	-	+	+	-	-	-	-	-
Appendicularia											
<i>Oikopleura dioica</i>	+	-	-	-	+	+	-	+	-	-	+
<i>O. longicauda</i>	-	-	-	-	+	-	-	+	-	-	-
Chaetognatha											
<i>Sagitta</i> sp.	-	-	-	-	+	+	-	+	-	-	+

Table 3. List of zooplankton found, and their presence at each station

Meroplanktonic Groups	STATIONS										
	1	2	3	4	5	6	7	8	9	10	11
Cirripedia											
Cirriped nauplius	+	-	-	-	+	+	-	+	+	+	+
Cirriped cypris larvae	-	+	-	+	+	+	-	+	-	-	+
Decapoda											
Brachyura zoea larvae	+	-	+	+	+	+	-	+	-	-	+
Brachyura megalopa larvae	-	-	-	-	-	+	-	+	-	-	-
Natantia zoea larvae	+	-	-	+	+	+	-	+	-	-	+
Bryozoa											
Cyphonautes larvae	-	-	-	-	+	-	-	-	-	-	-
Echinodermata											
Bipinnaria larvae	-	-	-	-	+	+	-	+	-	-	-
Holothuroidae larvae	-	-	-	-	+	-	-	+	-	-	-
Pluteus larvae	-	-	-	-	+	-	-	-	-	-	-
Annelida											
Polychaeta larvae	+	+	+	+	+	+	+	+	+	+	+
Mollusca											
Gastropoda larvae	+	-	-	+	+	+	-	+	-	-	+
Bivalvia larvae	-	-	-	+	+	+	+	+	-	-	+

Discussion and Conclusion

In this research, zooplankton samples obtained from 11 stations were studied. As a result, 6 cladoceran species, 27 pelagic copepod species, 2 pelagic tunicate species and 1 chaetognatha species were identified. Some larval meroplanktonic species from 7 different groups were found. The data on found species and groups in this study were presented with details on the tables.

Cladocera and copepods were the major holoplanktonic forms in the samples. And, *Calanipeda aquae-dulcis* was pronounced as a new copepod species for this area. Among the eleven stations, number 5, which is close to Homa Lagoon, and number 8, which is close to Cilazmak Lagoon were found to be the richest stations in terms of population. Because almost all holoplanktonic and meroplanktonic species and groups were found in these two stations. Especially, the area close to Homa Lagoon was found to be very rich based on zooplankton variety and density. *Acartia clausi* was found to be the most common copepod

species among all stations, except a couple of stations. *Oithona helgolandica*, *O. nana*, *Calanipeda aquae-dulcis*, and *Paracalanus parvus* were the second common copepod species. Cladocerans, *Podon polyphemoides*, *Evadne tergestina*, and copepods, *Paracalanus parvus*, *Centropages kroyeri*, *Acartia clausi*, *Oithona helgolandica*, *O. nana*, *Oncaea* sp. were found in each sampling date. The region of Homa Lagoon is the richest part of the studied area. It may explain us why productivity is high in the lagoon as well as why the lagoony area occurs there.

As mentioned previously, meroplanktonic forms were classified based on their groups. Annelid polychaeta larvae were observed as the most common meroplanktonic form among the stations. Brachyuran zoea larvae were found in each sampling time.

References

- Cirik S., Alpbaz A.G., Gökpinar S, ve Metin C., 1991, Homa (SUYO) Dalyanı (İzmir Körfezi) Fitoplanktonu Üzerine Bir Arastırma, E.U. Su Ürünleri Sempozyumu,

- 590-600.
- Ergen, Z., 1967, İzmir Körfezi'nde tespit edilen başlıca planktonik organizmalar, E.U. Fen Fak. İlmî Rap. Ser. 47:1-15.
- Hoşsucu, B., Ak, Y., 2000. Homa Dalyanı'nın İhtiyoplanktonu. E.Ü.Su Ürünleri Derg., 17/3-4, 197-212, İzmir.
- Kinacigil H.T., Alpbaz A.G., ve Saka S., 1991, Suyu (HOMA) Dalyanı Altınbaş Kefal (*Lizza aurata* Risso L.) Populasyonu Üzerine Araştırmalar, E.U. Su Ürünleri Sempozyumu, 484-495.
- Önen, M., ve Yaramaz, Ö., 1997, Homa Dalyanı Fiziko-Kimyasal Parametreleri ile bentik organizmaların Araştırılması. XIII. Ulusal Biyoloji Kongresi, 17-20 Eylül 1996. Cilt V, Hidrobiyoloji seksiyonu. S.24-34 İstanbul.
- Özden, O., Alpbaz, A.G., ve Tekin, M., 1991, Suyu (Homa) Dalyanında İstiridyeye Yetistireciliği, E. U. Su Ürünleri Sempozyumu, 609-621.
- Özel, I., 1977, İzmir Körfezi kladoserleri üzerine ilk gözlemler, TUBITAK VI. Bilim Kongresi Biyoloji Seksiyonu, 127-136
- Özel, I., 1979, İzmir Körfezi Meroplanktonunda Saptanan Macrura, Reptantia ve Anamura larvalarının Dağılımı Üzerine Pollusyononun Etkileri, TUJJB 11: s. 67-70.
- Özel, İ., Aker, V., 2001, İzmir Körfezi Zooplanktonunda Mevsimsel Değişimler. XI. Ulusal Su Ürünleri Sempozyumu Bildirileri Cilt I, Akyurt, İ., Başusta, N., Ed., Mustafa Kemal Üniv. Yay. No.8 :155-163