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The Copepoda and Cladocera (Crustacea) Fauna Along the Yumurtalık-Botaş Coastline in Iskenderun Bay

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Özet: ***Yumurtalık–Botaş kıyı şeridinde Copepoda ve Cladocera (Crustacea) faunası***. Bu çalışmada, İskenderun Körfezi Yumurtalık-Botaş kıyı şeridi kopepod ve kladoser faunası incelenmiştir. Çalışma alanında, kopepod takımına ait toplam 22 cins ve 33 tür, kladoserlere ait 2 cins, 3 tür saptanmıştır. Kopepodlardan *Labidocera pavo, Pontellina plumata, Heterorhabbus papilliger, Corycaeus speciosus*, *Corycaeus brehmi*, *Corycaeus limbatus* türleri İskenderun Körfezi için ilk kayıttır.

Anahtar Kelimeler: Kopepod, Kladoser, İskenderun Körfezi.

Abstract: In this study, the Copepoda and Cladocera fauna along the Iskenderun Bay, Yumurtalık-Botas coastlines were investigated. Within the study area, a total of 22 genera and 33 species belonging to Copepoda, and 2 genera and 3 species belonging to Cladocera were recorded. *Labidocera pavo*, *Pontellina plumata*, *Heterorhabbus papilliger*, *Corycaeus speciosus*, *Corycaeus brehmi*, *Corycaeus limbatus* species belonging to Copepoda were identified as first records in the Iskenderun Bay.

Key Words: Copepoda, Cladocera, Zooplankton, Iskenderun Bay.

Introduction

Within the food chain in an aquatic environment zooplankton consists the second step as well as the first consumer group. In this respect, the quantitative and qualitative investigation of zooplanktonic organisms in any aquatic environment is essential regarding the knowledge about the productivity in that specific environment. Copepoda accounts for the majority of zooplankton in oceans and seas. Copepods besides their biological and ecological importance, rank first among the zooplankton groups studied mostly by scientists all over the world thanks to the diversity of the species and their wide distribution. As well as Copepoda, Cladocera sometimes amount to high populations, especially during certain seasons.

Since Copepoda consist the second step of the food chain in the seas, they also play an important role in the diet of numerous species of fish at the larval stage. For this reason, the amount of fish to be obtained from an aquatic environment is, to a great extent, predetermined by the biomass of the zooplankton.

Related studies on this topic in the Eastern Mediterranean have been conducted by Kimor and Wood (1975), Pasteur et.al. (1976), Lakkis (1990), Böttger-Schnack (1994), Sıokou-Frangou et.al. (1996), and by Gökalp (1972) and Gücü *et al*. (1991) in the coastlines of Turkey.

In this study, Copepoda and Cladocera fauna were investigated in Iskenderun Bay (between the coastline of Yumurtalık and Botas) which is a very important region in the Northeastern Mediterranean in terms of commercial fishing.

Material and Methods

The study was conducted between April-1999 and December-1999 along the Yumurtalık-Botas coastline in Iskenderun Bay by studying the samples obtained horizontally from 6 selected stations which were10 meters in depth.

The stations in the Yumurtalık-Botas coastline, where the study was conducted, are approximately 17.5 kilometers in length and about 1.5 kilometers off the shore. The distance between the stations was approximately 3.5 kilometers (Figure 1).

Although sampling was performed every three months so as to reflect seasonal changes, winter sampling was inevitably made in December.

A plankton net of 30 cm in diameter and 100 micrometer mesh size was used for sampling.

The samples obtained were preserved in 4% formaldehyde and brought to the laboratory. The seasonal succession of species was identified, which were shown with (+).

Specimens were identified using criteria presented by Rose (1933); Brodskii (1950); Tregouboff and Rose (1957); Grice (1961); Kasturirangan (1963); Owre and Foyo (1967); Frost and Fleminger (1968); Boltovsky (1981); Dussart and Gafye (1995) and Özel (1996).

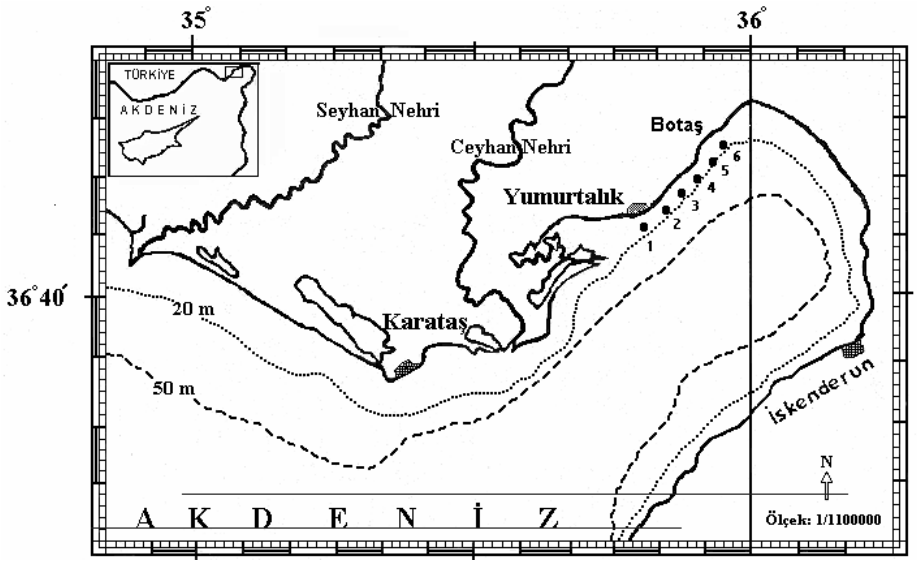

Figure 1. The study area in Iskenderun Bay

Results

Results of qualitative plankton analysis is shown in Table 1, and the seasonal succession of Copepoda and Cladocera in terms of the various stations is indicated in Table 2.

Table 1. Classification of copepoda and cladoceran species identified in the study area

CRUSTACEA
Subclassis:Copepoda
Ordo:Calanoida

Table 1. continued

Familia: Calanidae
Calanus (Nannocalanus) minör Claus, 1863
Familia: Calocalanidae
Calocalanus pavo Dana, 1848
Calocalanus pavoninus Farran, 1936
Mecynocera clausi Thompson, 1888
Familia: Paracalanidae
Paracalanus parvus Claus, 1863
Familia: Pseudocalanidae
Clausocalanus arcuicornis Dana, 1849
Clausocalanus furcatus Brady, 1883
Familia: Aetideidae
Euaetideus giesbrechti Cleve, 1904
Familia: Temoridae
Temora stylifera Dana, 1848
Familia: Centropagidae
Centropages kröyeri Giesbrecht, 1892
Centropages furcatus Björbberg, 1963
Familia: Lucicutiidae
Lucicutia flavicornis Claus, 1863
Familia: Heterorhabdidae
Heterorhabdus papilliger Claus, 1863
Familia: Pontellidae
Calanopia elliptica Dana
Labidocera pavo Giesbrecht, 1889
Pontellina plumata Dana, 1849
Pontella mediterranea Claus, 1863
Familia: Acartiidae
Acartia clausi Giesbrecht, 1889
Acartia negligens Dana, 1849
Ordo: Cyclopoida
Familia: Oithonidae
Oithona helgolondica Claus, 1863
Oithona nana Giesbrecht, 1892
Oithona plumifera Baird, 1843
Familia: Oncaeidae
Oncaea mediterranea Claus, 1863
Familia: Sapphirinidae
Sapphirina nigromaculata Claus, 1863
Familia: Corycaeidae
Corycaeus clausi Dahl, 1894
Corycaeus typicus Kröyer, 1849
Corycaeus giesbrechti Dahl, 1894
Corycaeus brehmi Stever, 1910
Corycaeus limbatus Brady, 1888
Corycaeus speciosus Dana, 1852
Corycaeus sp.
Corycella rostrata Claus, 1863
Ordo: Harpacticoida
Familia: Tachydiidae
Euterpina acutifrons Dana,1852
Subclassis: Branchiopoda

Table 1. continued

Ordo: Cladocera
Familia: Sidiidae
Penilia avirostris Rishard
Familia: Polyphemoidae
Evadne tergestina Claus
Evadne spinifera Kramer

Table 2. Seasonal succession of the copepoda and cladoceran species identified in the study area in terms of the 6 stations.

Identified Species	Seasons and Stations																							
	Spring						Summer						Autumn						Winter					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Acartia clausi	+		+	+	+	+			+															
Acartia negligens										+						+	+		+				+	
Calanopia elliptica																	+	+	+	+				
Calocalanus pavo													+						+	+	+	+	+	+
Calocalanus pavoninus														+		+	+		+	+	+	+	+	+
Clausocalanus arcuicornis	+	+			+	+	+	+			+	+	+	+	+	+		+	+	+	+	+	+	+
Clausocalanus furcatus	+						+		+	+			+	+	+		+	+	+	+	+	+	+	
Centropages furcatus	+						+		+	+			+	+	+		+	+		+		+		
Centropages kröyeri	+	+	+	+	+	+	+	+	+	+	+	+			+					+				
Corycaeus brehmi							+												+	+				
Corycaeus clausi	+	+	+	+	+	+		+	+	+	+													
Corycaeus giesbrechti														+										
Corycaeus limbatus							+												+	+	+	+		
Corycaeus sp.	+	+	+	+	+	+					+													
Corycaeus speciosus																					+	+	+	+
Corycaeus typicus	+																		+	+				
Corycella rostrata	+		+				+			+			+											
Euaetideus giesbrechti																				+		+	+	
Euterpina acutifrons	+	+	+			+	+					+	+	+	+	+			+	+	+	+	+	+
Haloptilus longicornis																							+	
Heterorhabbus papilliger																			+					
Labidocera pavo													+	+	+	+	+							
Lucicutia flavicornis																						+		
Mecynocera clausi														+					+	+	+	+	+	+
Nannocalanus minör													+	+	+	+	+	+		+		+	+	
Oithona helgolandica	+						+	+	+	+	+		+	+	+	+	+		+	+	+	+	+	+
Oithona nana	+		+	+	+	+		+			+		+	+	+	+	+		+	+	+	+	+	
Oithona plumifera										+	+	+	+						+	+	+	+	+	+
Oncea mediterranea																			+	+	+		+	
Paracalanus parvus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Pontella mediterranea																	+	+						
Pontellina plumata															+									
Sapphirina nigromaculata																								+
Temora stylifera	+	+	+	+	+	+	+	+	+	+	+	+			+	+	+							
Evadne spinifera	+		+	+	+	+	+	+	+	+	+	+		+				+						
Evadne tergestina							+	+	+	+	+							+						
Penilia avirostris	+	+	+			+	+	+	+	+	+	+					+	+						

As it can be observed in Table 2, there exist differences between the seasonal succession of the Copepoda and Cladocera species which were identified in the study area. Among these, *Paracalanus parvus*, *Clausocalamus arcuicornis*, *Clausocalamus furcatus*, *Centropages kröyeri*, *Centropages furcatus*, *Oithona nana* and *Euterpina acutifrons* were generally identified in every season, whereas *P. parvus* was identified only in 6 stations.

Nannonocalanus minor, *Calocalanus pavo*, *Calocalanus pavoninus*, *Mecynocera clausi*, and *Calonopia elliptica* are the species observed solely in autumn and winter. *Acartia negligens* and *Oithona plumifera* were observed in summer, autumn, and winter. *Acartia clausi*, *Corycaeus clausi*, and *Corycaeus* species were observed in spring and summer. However, *Temora stylifera, Corycella rostrata* were observed in spring, summer, and autumn. *Corycaeous giesbrechti*, *Labidocera pavo*, *Pontellina plumata*, and *Pontella mediterranea* were observed in autumn, *Corycaeus brehmi*, and *Corycaeus limbatus* in summer and winter, and finally, *Oncea mediterranea*, *Sapphirina nigromaculata*, *Holoptilus longicornis*, *Euaetideus giesbrechti*, *Heterorhabbus papilliger*, and *Lucicutia flavicornis* were observed only in winter.

Throughout the study, only one species for *Sapphirina nigromaculata*, *Haloptilus longicornis*, *Heterorhabbus papilliger*, and *Pontellina plumata* species each was observed.

Of the Cladocera, *Penilia avirostrsi*, *Evadne tergestina*, and *Evadne spinifera* species were observed in spring, summer, and autumn. No single Cladocera species was identified in winter.

Discussion

A total of 33 copepoda and 3 cladoceran species were identified in this study. The families and the number of species belonging to the Copepoda are as follows: Calanidae 1, Calocalanidae 3, Paracalanidae 1, Pseudocalanidae 2, Aetideidae 1, Temoridae 1, Centropagidae 2, Lucicutiidae 1, Heterorhabdidae 1, Pontellidae 4, Acartidae 2, Oithomidae 3, Oncaeidae 1, Sapphirinidae 1, Corycaeidae 1 genus and 7 species, and Tachydiidae 1. In addition to these, those which belong to the Cladocera are 1 species belonging to the Sidiidae family and 2 species to the Polyphemoidae family.

Labidocera pavo, *Pontellina plumata*, *Heterorhabbus papilliger*, *Corycaeus speciosus*, *Corycaeus brehmi* and *Corycaeus limbatus* belonging to Copepoda have never been observed in the studies previously conducted in the Iskenderun Bay. Consequently, these species can be regarded as first records in the Iskenderun Bay.

This study has also contributed, though to a certain extent, to the identification of the seasonal succession of the species belonging to the Copepoda and Cladocera groups in the coastal study area in the Iskenderun Bay. However, further comprehensive studies on investigating the monthly or seasonal quantitative changes of the Copepoda and Cladocera in the Iskenderun Bay and the biomass of these groups in terms of their dominance levels in per unit volume or area of water can also contribute to a better identification of the Copepoda and Cladocera fauna in this area.

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