

The Larval Chironomidae (Diptera) Fauna of Gökçeada (Imbroz)

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ABSTRACT

Benthos specimens were collected by hand mud scoop from 21 localities in Gökçeada during each field work, between 06-28.07.1991 and 06-10.08.1999. Specimens were collected from every kind of habitat as possible (e.g. lakes, ponds, dams, streams and troughs). As a result of this study 53 species of 34 genuses were determined from subfamilies Tanypodinae, Orthocladiinae and Chironominae (Chironomini and Tanytarsini) of Chironomidae family. 35 of the 53 species that were determined are new records for the larval Chironomidae fauna of Gökçeada. 25, the species number described in previous studies in Gökçeada, has increased to 60 with this study.

Key Words: Diptera, Chironomidae, Limnofauna, Gökçeada (Imbroz), TURKEY.

1. INTRODUCTION

1.1 Description of Work Field

Gökçeada is in the North east region of the Aegean sea which occurred by the breaking and collapsement of the ground at the end of the 3rd and at the beginning of the 6th geological era, approximately 2-2,5 million years ago, and it is the continuity of Anatolia and Thrace [1, 2, 3]. It is the biggest island of Turkey with an area of 285, 5 km² area and for abundance of water it is the fourth biggest island in the world. In Gökçeada, there are 5 dams and 1 salt lake as natural water. Dams are nourished by underground sources. Salt lake (Lagoon Lake) is very close to the sea and in winter it unites with the sea and in summer, salt is obtained by the drying of water. There are streams whose water levels are low and show continuity.

The first studies in Gökçeada were done by our country's researchers, hydrobiologists and geologists [4, 5]. The first studies with invertebrates were done with butterflies (Lepidoptera) [6] and Chironomids (Diptera) [7]. Specimens of Chironomid larval fauna of Gökçeada which were collected in 1985- 1986 and 1987 were examined by Yalçın, Tanatmış and Küçük [7] and 25 species belonging to 19 genuses have been determined.

Chironomids of Gökçeada have tried to be examined widely with this study. For this reason specimens were collected from every kind of possible watery localities (dams, ponds, lakes, streams etc.) and aimed to contribute to the exposing of Chironomid fauna.

2. MATERIAL and METHOD

Benthos specimens were collected with hand mud scoop from 21 localities in Gökçeada during each field work, between 06-28.07.1991 and 06-10.08.1999. They were fixed with 70% alcohol and brought to the laboratory (Figure 1). Chironomid larvae were cleaned under binocular microscope and separated from other groups. Firstly temporary and then permanent preparations were done by Şahin [8] and Özkan's [9] methods. During this treatment firstly the head capsules and then bodies of the larvae were separated under binocular microscope. The head capsules were boiled in 10% KOH for 5-15 minutes and waste tissues were removed with this treatment. They were waited for 20 minutes by taking their pure water and then, they were waited in 70% alcohol for 15 minutes. At last they were taken to 80%-90%-96%-100% alcohol series for 10 minutes and they were kept in xylene for 1-2 minutes and closed with entellan. Bodies of larvae were taken only to alcohol series and closed with entellan. Then species determination was done under microscope marked Olympus.

In determination of species, it was benefited from Chernovskii [10], Moller Pillot [11, 12], Fittkau and Roback [13], Şahin [8, 14, 15], Şahin, Tanatmış and Küçük [7], Kırgız [16], Özkan [9, 17, 18], Epler I and II [19] and Sever [20].

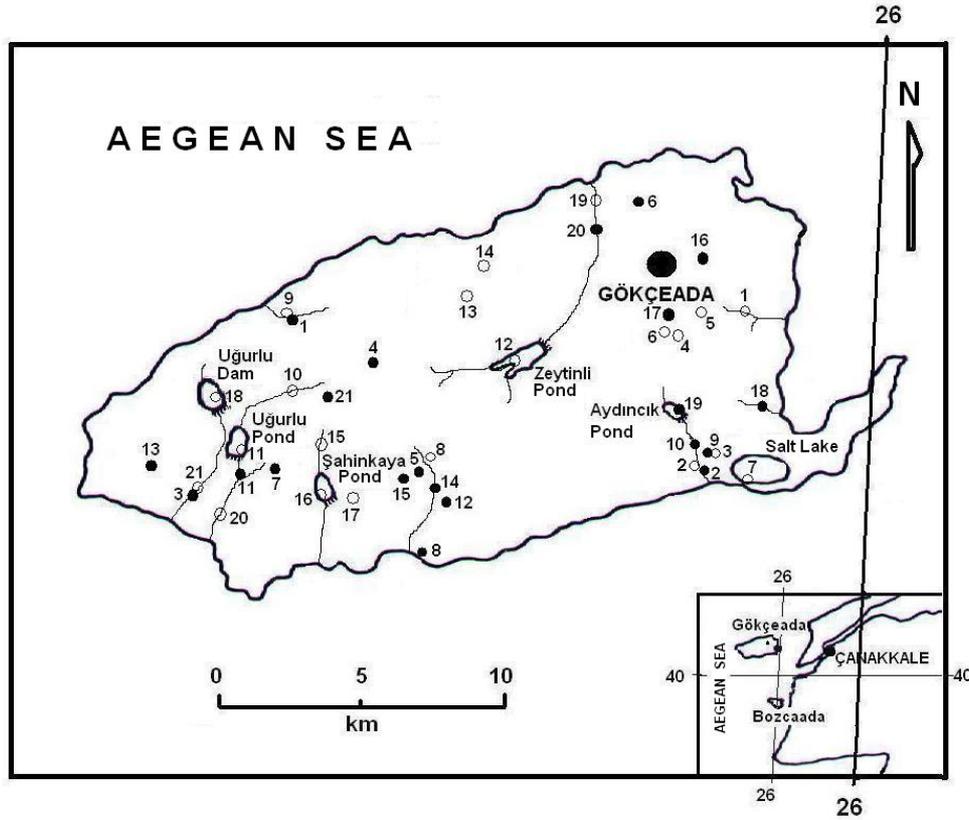


Figure 1. Localities in Gökçeada where specimens were collected:

1991 (●) : 1- Marmoris stream, 2- Aydıncık stream, 3- Uğurlu stream, 4- Şahinkaya fountain, 5- Erenyurt fountain, 6- Yenibademli fountain, 7- Open prison fountain, 8- Kapıkaya police Station fountain, 9- Aydıncık fountain, 10- Aydıncık stream, 11- Ballidere stream, 12- Kapıkaya fountain, 13- Uğurlu Village fountain, 14- Erenyurt stream, 15- Erenyurt spring, 16- Mandıra fountain, 17- Aydıncık road fountain, 18- Kaferoz stream, 19- Aydıncık pond, 20- Yenibademli big stream. 21- Dereköy laundry fountain.

1999 (○) : 1- Civakı stream 2- Aydıncık stream, 3- Aydıncık stream, 4- Beşiktaş stream, 5- Börekçi Cafer Varol fountain, 6- Slaughterhouse fountain, 7- Salt Lake, 8- Karayolları (Hanefi) fountain, 9- Marmoris stream, 10- Dereköy stream, 11- Uğurlu pond, 12- Zeytinli pond, 13- Tepeköy fountain, 14- Pınarbaşı fountain, 15- Şahinkaya stream, 16- Şahinkaya pond, 17- Şahinkaya fountain, 18- Uğurlu dam, 19- Kaleköy Big stream, 20- Ballisteam, 21- Uğurlu stream.

3. FINDINGS

As a result of the field work done in Gökçeada, 53 species of 34 genera from 3 subfamily of Chironomidae family have been determined (Table 1).

Table 1. Numerical distribution of Gökçeada Chironomidae subfamily, genus and species.

Subfamily	Tribus	Genus	Species
Tanypodinae		11	12
Orthocladiinae		5	8
Chironominae	Chironomini	12	26
	Tanytarsini	6	7
Total		34	53

In Gökçeada Şahin, Tanatmış and Küçük [7] have determined 25 species of 19 geniuses in their study. 16 of these geniuses were common with this study, 3 of these have not been encountered and also 18 geniuses have been determined for the first time. According to the species, 18 of the 53 have been determined before, 35 species were new records for Gökçeada (Table 2). 7 species which were determined before have not been encountered in this study. Literatures are insufficient for the determination of 5 species. They will be taken up in further studies after the scanning of literatures have been done.

Table 2. The list of Gökçeada Chironomidae larvae species.

TANYPODINAE

Tanytus punctipennis Mg. ***
Procladius (Holotanytus) sp. *
Clinotanytus pinguis (Loew) ***
Macropelopia nebulosa (Mg.) ***
Macropelopia goetgheuberi K. ***
Krenopelopia sp. ***
Brundiniella eumorpha Subl. ***
Arctopelopia sp. *
Telmatopelopia nemorum (G.) *
Apsectrotanytus trifascipennis (Zett.) *
Psectrotanytus varius (Fabr.) ***
Pentaneurella katterjokke Fittk, Murray **

ORTHOCLADIINAE

Cricotopus (Cricotopus) bicinctus (Mg.) *
Cricotopus (C.) annulator G. **
Cricotopus (Isocladius) sylvestris (Fabr.) ***
Limnophyes pusillus Eat ***
Psectrocladius (Psectrocladius) limbatellus Holm. ***
Psectrocladius (P.) psilopterus K. **
Psectrocladius (P.) stratiotis K. *
Psectrocladius (Allopectrocladius) dilatatus v. d. w. ***
Paratrissocladius excerptus (Walk.) *
Paracladius conversus (Walk.) **
Rheocricotopus fuscipes K. ***
Thienemanniella vittata Edw. ***

CHIRONOMINAE

CHIRONOMINI

Chironomus halophilus K. ***
Chironomus anthracinus Zett. *
Chironomus viridicollis K. ***
Chironomus thummi K. *
Chironomus (Camptochironomus) tentans Fabr. ***
Chironomus plumosus (L.) *
Chironomus salinarius K. ***
Stictochironomus longipugionis Şahin *
Stictochironomus yalvacii Şahin **
Polypedilum scalaenum Schr. ***
Polypedilum convictum (Walk.) *
Polypedilum bicrenatum K. ***
Polypedilum aberrans Tsch. ***
Polypedilum pedestre (Mg.) ***
Polypedilum sp. ***
Pentapedilum exsectum K. ***
Paralauterborniella nigrohalteralis (Mall.) **
Microtendipes chloris (Mg.) ***

Paratendipes intermedius Tsch. *
Paratendipes demirsoyus Şahin *
Parachironomus arcuatus G. ***
Dicotendipes nervosus (Staeg.) ***
Dicotendipes tritonus (K.) ***
Dicotendipes tendens (Fabr.) **
Cryptotendipes holsatus Lenz ***
Cryptochironomus defectus K. ***
Cryptocladopelma laccophila Lenz ***
Einfeldia pagana (Mp.) ***
Endochironomus tendens (Fabr.) ***

TANYTARSINI

Micropsectra praecox Mg. *
Cladotanytarsus mancus (Walk.) ***
Paratanytarsus lauterborni (K.) *
Tanytarsus gregarius K. *
Tanytarsus sp. ***
Virgotanytarsus arduennensis (G.) *
Rheotanytarsus exiguus Joh. ***

* Species common with Şahin, Tanatmış and Küçük [7].

** Species determined by Şahin, Tanatmış and Küçük [7] that could not be found by us.

*** Species which are new records for Gokceada .

4. DISCUSSION and RESULTS

In conclusion, with this study 53 species of 34 genera which belong to subfamilies of Tanyptodinae, Orthoclaadiinae and Chironominae of larval Chironomidae family were determined in Gökçeada. 25 species were determined by Şahin, Tanatmış and Küçük [7] in previous larval Chironomid studies on the island. For this reason 35 of these found species are new records for Gökçeada (Table 2). 5 of the 53 species which were determined in the work field, were given as (*Procladius (Holotanypus) sp.*, *Krenopelopia sp.*, *Arctopelopia sp.*, *Polypedilum sp.* and *Tanytarsus sp.*) since the literatures at hand were insufficient. For this reason, related to these studies, they needed to be researched again. These species:

The closeness of the Ring of maxilla palp to the distal, and the closeness of the *Krenopelopia sp* to *K. binotata* (Wied) which is in the Palearctic region, shows similarity with the occurrence of all the smooth and yellow back feet hooks. Moreover, the existence of three middle teeth which are nearly equal to each other in the glossa and there is no width differences between all glossa teeth, it differs by of the long arm of the paraglossa being curved.

Arctopelopia sp. is similar to *A. barbitarsis* (Zett.) with its maxil palp ring organ closer to the tip at basal segment and 25-35 teeth on the epifarinx comb. Its glossa teeth line is not very deeply concaved. It is separate by the excess of the difference of the paraglossa arm size. In this species, the glossa tooth is collapsed and lined up as deeply concaved, also there is not any size difference between paraglossa arm

Polypedilum sp. is similar to *P. aberrans* Tsch. with 5 joint antenna and there were alternate on its II. and III. antenna joint of Lauterborn Organs. It differs from other species which have two teeth on the mentum.

Tanytarsus sp. is similar to *T. gregarius* K. with the simplicity of back feet hooks and same colors, it differs by its longer antennas than its head and its first two antennas are dark brown in color.

Psectrotanypus varius, *Tanytus punctipennis*, *Cricotopus bicinctus*, *C. annulator*, *C. sylvestris*, *Limnophyes pusillus*, *Psectrocladius dilatatus*, *P. limbatellus*, *P. psilopterus*, *Chironomus salinarius*, *C. halophilus*, *C. thummi*, *C. anthracinus*, *C. (Camptochironomus) tentans*, *C. plumosus*, *Einfeldia pagana*, *Dicortendipes nervosus*, *D. tritonus*, *Endochironomus tendens*, *Microtendipes chloris*, *Parachironomus arcuatus*, *Pentapedilum exsectum*, *Polypedilum convictum*, *P. bicrenatum*, *P. pedestre*, and *Cladotanytarsus mancus* species are widespread all over the Palearctic Region [21]. These species spread all over the Palearctic Region from the glacier lake in the middle Palearctic Region with migration to the east, west and south like some other animal species when the climate had become worse [8].

Twenty three of the determined species in the work field were obtained from streams, eighteen of them were from

stagnant water, the other eighteen were from both streams and stagnant water also only one of them was obtained from salty water. There are no acute limits among fresh water habitats. In stream or stagnant water, many habitats like sand, mud, plant, rock or parts of trees which were waited in water for a long time, might be found side by side or one within the other [9]. For this reason, the limiting of habitats was done relatively roughly. It aimed to reveal the general habitats chosen by the species.

Larvas of Orthoclaadiinae subfamily were generally taken from streams and this situation shows compatibility with the literature [22].

As in other studies, many species from Chironominae subfamily have been found. This situation can be explained as the localities which the samples were taken from were generally dams, lakes, ponds, water heaps, fountain environments (Figure 1) and by the slowly flowing water in streams or by streams becoming heaps because of the summer season.

Chironomus thummi was found as a widespread species with 14 localities, as in the field work of Şahin, Tanatmış and Küçük [7] at the field work on 06-28/07/1991. Other species were found in only few localities and in general, the variety of species (16 species) of the localities was seldom. Although the number of localities were the same, the reason for less variety could be thought of as fountains and environment waters (11 locality) being found in majority, the presence of some small water heaps, generally polluted water in these kinds of locality grounds and the grounds having a muddy and a little sandy quality (Figure 1).

During 06-10/08/1999 dated field work, the number of localities was the same with the preceding field work but localities like dams, lakes, ponds and streams were in majority. Especially the grounds of the localities were covered with small and large sand, rock, algae, plant, mud and organic waste. This can be thought of as the reason for the increase in species variety (50 species) in localities and Gökçeada. *Polypedilum scalaenum* was the dominant species on these types of grounds with 12 localities which live mostly in stagnant water and on sandy ground. Then comes *Procladius (Holotanypus) sp.* with 10 localities. In the localities carnivorous species like *Procladius (Holotanypus) sp.* ve *Macropelopia nebulosa* were in majority. This could be the limiting factor for the increase of the individual number and variety.

During the second field work, *Chironomus thummi* was found in 4 localities because the ground was sandy and full of rock etc. rather than muddy and the water was clean. The species *Chironomus salinarius* was found in only one locality and in plenty amount in Aydınçık Salt Lake. This situation is compatible with the habitat of this species [11] because this locality was connected with the sea and had a salty water feature and its ground was muddy. No other species were encountered only in this locality because of this feature.

In conclusion, Gökçeada and localities were rich in species variety. At most localities, the species number was approximately between 6 and 10. The number of Chironomid species in Gökçeada has increased to 60 with this study.

Table 3. Distribution of Gökçeada Chironomid larval species according to habitats.

Species	Stagnant water	Streams	Salty water	Sand	Mud	Plant	Detritus	Rock	Tree arms pieces
<i>Tanypus punctipennis</i>	+	+		+	+	+	+	+	
<i>Procladius (Holotanypus) sp.</i>	+	+		+	+	+	+	+	
<i>Clinotanypus pinguis</i>		+		+				+	
<i>Macropelopia nebulosa</i>	+	+		+	+		+	+	
<i>Macropelopia goetgheuberi</i>		+		+		+		+	
<i>Krenopelopia sp.</i>	+			+					
<i>Brundiniella eumorpha</i>		+		+			+		
<i>Arctopelopia sp.</i>		+				+		+	
<i>Telmatopelopia nemorum</i>		+		+	+	+	+	+	
<i>Apsectrotanypus trifascipennis</i>		+		+		+			
<i>Psectrotanypus varius</i>		+		+	+	+			
<i>Pentaneurella katerjokke</i>		+		+					
<i>Cricotopus (Cricotopus) bicinctus</i>		+		+		+		+	
<i>Cricotopus (C.) annulator</i>		+			+	+		+	
<i>Cricotopus (Isocladius) sylvestris</i>	+	+				+		+	
<i>Limnophyes pusillus</i>		+		+				+	
<i>Psectrocladius (Psectrocladius) limbatellus</i>		+		+					
<i>Psectrocladius (P.) psilopterus</i>		+			+				
<i>Psectrocladius (P.) stratiotis</i>		+			+	+		+	
<i>Psectrocladius (Allopsectrocladius) dilatatus</i>		+		+		+			
<i>Paratrissocladius excerptus</i>		+			+				
<i>Paracladius conversus</i>	+	+			+	+		+	
<i>Rheocricotopus fuscipes</i>		+				+		+	
<i>Thienemanniella vittata</i>		+				+		+	
<i>Chironomus halophilus</i>	+			+					
<i>Chironomus anthracinus</i>	+	+		+	+		+		
<i>Chironomus viridicollis</i>	+	+		+	+		+		
<i>Chironomus thummi</i>	+			+	+	+			
<i>Chironomus (Camptochironomus) tentans</i>	+	+		+	+		+		
<i>Chironomus plumosus</i>	+			+	+		+		
<i>Chironomus salinarius</i>			+		+				
<i>Stictochironomus longipugionis</i>	+	+		+		+		+	
<i>Stictochironomus yalvacii</i>	+	+		+					
<i>Polypedilum scalaenum</i>	+	+			+	+			
<i>Polypedilum convictum</i>	+				+	+		+	
<i>Polypedilum bicrenatum</i>	+				+	+			
<i>Polypedilum aberrans</i>	+	+		+	+	+		+	
<i>Polypedilum pedestre</i>	+				+	+			
<i>Polypedilum sp.</i>	+	+			+		+		
<i>Pentapedilum exsectum</i>		+		+					
<i>Paralauterborniella nigrohalteralis</i>		+		+		+			
<i>Microtendipes chloris</i>	+	+		+		+		+	
<i>Paratendipes intermedius</i>	+	+			+		+		
<i>Paratendipes demirsoyus</i>	+	+		+	+	+		+	
<i>Parachironomus arcuatus</i>	+					+		+	
<i>Dicotendipes nervosus</i>	+					+		+	+
<i>Dicotendipes tritonus</i>	+					+		+	
<i>Dicotendipes tendens</i>		+				+			
<i>Cryptotendipes holsatus</i>	+					+		+	

<i>Cryptochironomus defectus</i>	+	+		+	+		+	+
<i>Cryptocladopelma laccophila</i>	+		+					+
<i>Einfeldia pagana</i>	+			+	+			
<i>Endochironomus tendens</i>	+		+		+			+
<i>Micropsectra praecox</i>	+		+					
<i>Cladotanytarsus mancus</i>		+		+			+	+
<i>Paratanytarsus lauterborni</i>		+	+				+	
<i>Tanytarsus gregarius</i>	+		+		+			
<i>Tanytarsus sp.</i>	+		+					
<i>Virgotanytarsus arduennensis</i>	+						+	
<i>Rheotanytarsus exiguus</i>	+	+		+	+			

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