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SHORT PAPER

Twelve New Records (Clitellata, Chironomidae and Gastropoda) from Lake Gölbaşı (Hatay-Turkey)

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Abstract

Samples were collected from 3 different stations between October 2011 and June 2012 with a view to identifying the macrozoobenthic fauna (especially Gastropoda, Clitellata and Chironomidae) of Lake Gölbaşı, located in Southern Anatolia. A total of 14 species were determined, 12 of them (Valvata macrostoma, *Theodoxus anatolicus*, *Physella acuta* (Gastropoda); *Potamothrix hammoniensis*, *Psammoryctides albicola* (Clitellata); *Harnischia fuscimana*, *Einfeldia pagana*, *Chironomus thummi*, *Polypedilum sordens*, *Polypedilum convictum*, *Polypedilum scalaenum* and *Cladotanytarsus mancus* (Chironomidae)) are first published records for Lake Gölbaşı and two of them (*Melanoides tuberculatus* and *Melanopsis costata* (Gastropoda)) have previously been reported from the lake.

Keywords: Macrozoobenthic, limnofauna.

Gölbaşı (Hatay-Türkiye) Gölü'nden 12 Yeni Kayıt (Clitellata, Chironomidae ve Gastropoda)

Özet

Ekim 2011 ve Haziran 2012 tarihleri arasında, Güney Anadolu'da yer alan Gölbaşı Gölü'nün makrozoobentik faunasını (özellikle Gastropoda, Clitellata ve Chironomidae) belirlemek amacıyla 3 farklı istasyondan örnekler toplanmıştır. Toplam 14 tür belirlenmiştir. Bunlardan ikisi (*Melanoides tuberculatus* ve *Melanopsis costata* (Gastropoda)) alanda daha önce bildirilmiştir; fakat bunların 12'si (Valvata macrostoma, Theodoxus anatolicus, Physella acuta (Gastropoda); *Potamothrix hammoniensis, Psammoryctides albicola (Clitellata); Harnischia fuscimana, Einfeldia pagana, Chironomus thummi, Polypedilum sordens, Polypedilum convictum, Polypedilum scalaenum* ve *Cladotanytarsus mancus* (Chironomidae)) Gölbaşı Gölü için yeni kayıttır.

Anahtar Kelimeler: Makrozoobentik, limnofauna.

Introduction

Macrozoobenthic community is mainly found as benthos in freshwater. Macrozoobenthos is defined as a group of invertebrates, whose existence for the greater part of their life cycle is related to bottom substrates of water bodies. Bottom communities of most lentic systems are represented by three major groups: Gastropoda, chironomid larvae and clitellatas. Freshwater gastropods and clitellatas permanently live on the bottom, whereas chironomids, being larval forms of insects, spend only a part of their life cycle on the bottom of water bodies. Certain species of Gastropoda, Clitellata and Chironomidae are considered a promising indicator of water quality because of their ubiquity and abundance in aquatic ecosystems (Bouchard, 2004).

Turkey is the only country covered almost entirely by three of the world's 34 biodiversity hotspots: the Caucasus, Irano-Anatolian and Mediterranean (Mittermeier *et al*., 2005; Conservation International, 2005). Turkey has a remarkable biodiversity due to its geographical and climatic status enjoying some of the most important areas in terms of natural freshwater lakes and wetlands in the Palearctic, as has been shown by the recent list of the Important Bird Areas (IBAs) of Turkey (Magnin and Yarar, 1997). Lake Gölbaşı (Hatay), which is a natural lake, is situated in the south of Turkey, 50 km from the city of Antakya (Figure 1). Lake Gölbaşı formed after Lake Amik was drained in 1968 and it occupies an area of 12 km^2 including a marshland of 4

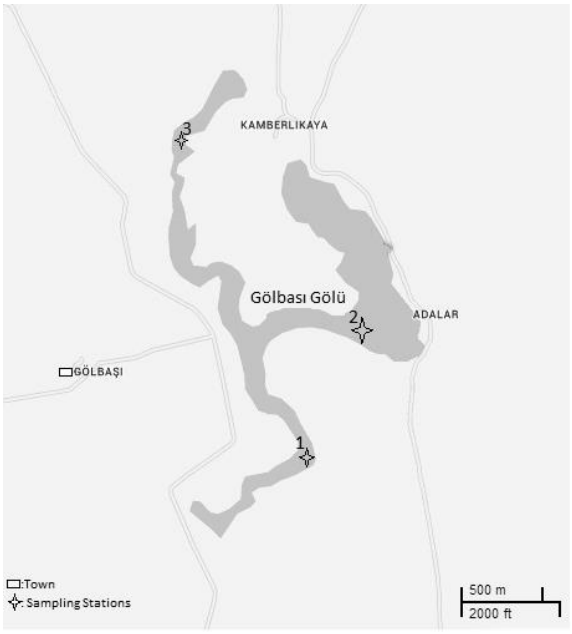

Figure 1. Geographical situation and sampling stations in Lake Gölbaşı (Hatay).

km^2 (Şereflişan *et al*., 2009) and it was classified as eutrophic (Şereflişan, 2003).

The studies on macrozoobenthic fauna of Lake Gölbaşı are rather limited but 3 species belonging to the subclass Pulmonata (*Gyraulus piscinarum, Radix labiata, Anisus leucostoma*) and 9 species of the subclass Prosobranchia (*Theodoxus jordani, Semisalsa contempta, Semisalsa longiscata, Bithynia phialensis, Valvata saulcyi, Valvata piscinalis, Melanoides tuberculatus, Melanopsis praemorsa ferussaci, Melanopsis costata costata*) were determined as a result of the gastropoda fauna research of Lake Gölbaşı (Şereflişan *et al*., 2009). *Pisidium casertanum* (Bivalvia) was recorded from Lake Gölbaşı by Şereflişan *et al*. (2007). *Unio terminalis delesserti, U. tigridis tigridis, Anadonta vescoiana, Anadonta gabillota pseudodopsis, Potamida littoralis homensis, P. littoralis semirugata* and *Leguminaia wheatleyi* were reported by Şereflişan (2001).

Present study aims to investigate the macrozoobenthic community composition and distribution of the Gastropoda, Clitellata and Chironomidae species in Lake Gölbaşı. It was also aimed to fill a gap in the number of the studies made to determine the macrozoobenthic community composition of Lake Gölbaşı.

Materials and Methods

Samples were collected in two replicas with a hand net (with coverage of 0.025 m^2) from 3 stations (Figure 1) between October 2011 and June 2012. Samples were fixed on site with 4% formaldehyde and transferred to 70% ethyl alcohol in the laboratory. After the samples had been sorted, gastropods, clitellatas and chironomids larvae were prepared for identification by either mounting permanently on slides (with Canada balsam) or prepared temporary mounts using a glycerin-water (1:5) solution. Clitellata specimens were identified mainly according to Brinkhurst and Jamieson (1971) and Timm (2009); for Chironomidae samples Şahin (1991) and Epler (1995); for Gastropoda samples Zhadin (1965), Bilgin (1980), Glöer (2002), Glöer and Meier-Brook (1998), and Schütt (1965); for other taxa Bouchard (2004) and Elliott *et al.* (1988) were used.

Results

In the present investigation total of 16 invertebrate taxa were recorded (only Gastropoda, Clitellata and Chironomidae samples were identified to the genus or species level) from the Lake Gölbaşı (Table 1). Distributions of benthic macroinvertebrates of Lake Gölbaşı according the stations were shown in Figure 2.

In the present study, a total of 14 species (five species from Gastropoda, two species from Clitellata and seven species from Chironomidae) were determined. Twelve of them *Valvata macrostoma, Theodoxus anatolicus, Physella acuta* (Gastropoda); *Potamothrix hammoniensis, Psammoryctides albicola* (Clitellata); *Harnischia fuscimana, Einfeldia pagana, Chironomus thummi, Polypedilum sordens, Polypedilum convictum, Polypedilum scalaenum* and *Cladotanytarsus mancus* (Chironomidae) are new records for Lake Gölbaşı. Two of them (*Melanoides tuberculatus* and *Melanopsis costata* (Gastropoda)) have previously been reported from the lake Gölbaşı (Şereflişan, 2009).

According to our results, the most diverse group

Table 1. Sampling site details and taxonomical list of macrozoobenthic community which were determined of the Lake Gölbaşı in the period of investigations and their proportional (as %)

	Stations			
	1	2	3	Average
Coordinate	36º29'46.32''K 36º29'14.30''D	36º30'16.27''K 36º29'39.45''D	36º30'26.39''K 36º29'04.11''D	
Depth (m)	1.2	2.3	2	
Substratum	mud	mud	mud	
Taxa				
Gastropoda				
Valvata macrostoma (Morch,1864)	0.00	0.25	0.00	0.08
Theodoxus anatolicus (Recluz, 1844)	11.17	11.79	8.00	10.32
Physella acuta (Draparnaud, 1805)	0.00	0.25	0.00	0.08
Melanoides tuberculatus (Müller, 1774)	20.11	44.23	15.00	26.45
Melanopsis costata (Olivier, 1804)	6.70	9.34	11.50	9.18
Average Gastropoda	38.0	65.8	34.5	46.11
Clitellata				
Psammoryctides albicola (Michaelsen, 1901)	5.03	2.21	8.00	5.08
Potamothrix hammoniensis (Michaelsen, 1901)	6.70	10.57	12.00	9.76
Average Clitellata	11.7	12.8	20.0	14.83
Chironomidae				
Harnischia fuscimana (Kieffer, 1921)	0.00	0.25	0.00	0.08
Einfeldia pagana (Meigen, 1838)	1.12	0.49	0.50	0.70
Chironomus thummi (Kieffer, 1911)	21.23	4.67	17.00	14.30
Polypedilum sordens (van der Wulp, 1874)	0.56	0.25	0.50	0.43
Polypedilum convictum (Walker, 1856)	0.56	0.25	0.00	0.27
Polypedilum scalaenum (Schrank, 1803)	5.03	6.39	4.50	5.31
Cladotanytarsus mancus (Walker, 1856)	1.12	0.49	1.00	0.87
Average Chironomidae	29.6	12.8	23.5	21.96
Gammaridae	11.17	6.39	4.50	7.35
Bivalvia	9.50	2.21	17.50	9.74
Number of taxa	13	16	12	
Shannon-Wiener Diversity Index	2.176	2.186	1.861	2.074

was Chironomidae (7 species), followed by Gastropoda (5 species). The greater part of benthic invertebrate was represented by Gastropoda and Chironomidae larvae. It was found that Gastropoda group had 5 taxa and the highest abundance with 46.11%. *Melanoides tuberculatus* belonging to this group was found to have the highest abundance (26.45%) and it was followed by *Theodoxus anatolicus* (10.32%) and *Melanopsis costata* (9.18%). Chironomidae larvae group had 7 taxa and 21.96% abundancy. *Chironomus thummi* belonging to this group was found to have the highest abundance (14.30%) and it was followed by *Polypedilum scalaenum* (5.31%).

As can be seen in Table 1, the numbers of benthic invertebrates taxa recorded in the stations could be ordered as 2>1>3>. According to Shannon-Wiener index, the species diversity in the lake Gölbaşı was found as 2,074 at average and, 1st station was found to have the widest diversity while 3rd station to have the poorest diversity. According to Bray-Curtis similarity index (Figure 3), 1st and 3nd stations were found to be very similar to each other while 2nd station was found to be the most different from all the other station for the dynamics of the benthic invertebrate fauna (both the numbers and species).

Discussion

The present record contributes to the knowledge on the limnofauna of the Lake Gölbaşı. Our results shown that macrozoobenthic fauna of Lake Gölbaşı was dominated by three group invertebrates, Gastropoda, Clitellata and Chironomidae that is typical of many freshwater systems and they have been known as tolerant organisms to pollution. Some species of them are sensitive to specific forms of pollution and exact species are quite tolerant (Brinkhurst and Jamieson, 1971; Epler, 1995; Dillon *et al*., 2002 and Taylor, 2003), such as *Physella acuta* (Gastropoda), *Potamothrix hammoniensis* (Clitellata) and *Chironomus thummi* (Chironomidae). In addition, all species especially Clitellata and Chironomidae which were identified from Lake Gölbaşı) are widely distributed throughout the world (Epler, 1995; Wetzel *et al*., 2000; Taylor, 2003). Our result indicated that macrozoobenthic fauna (especially Clitellata, Chironomidae) Lake Gölbaşı consists mainly of taxa with wide ecological tolerances and extensive geographical ranges.

As for species of Gastropoda, determined in this study showed a wide variety of distributional point of view: from a globally invader to relatively living in

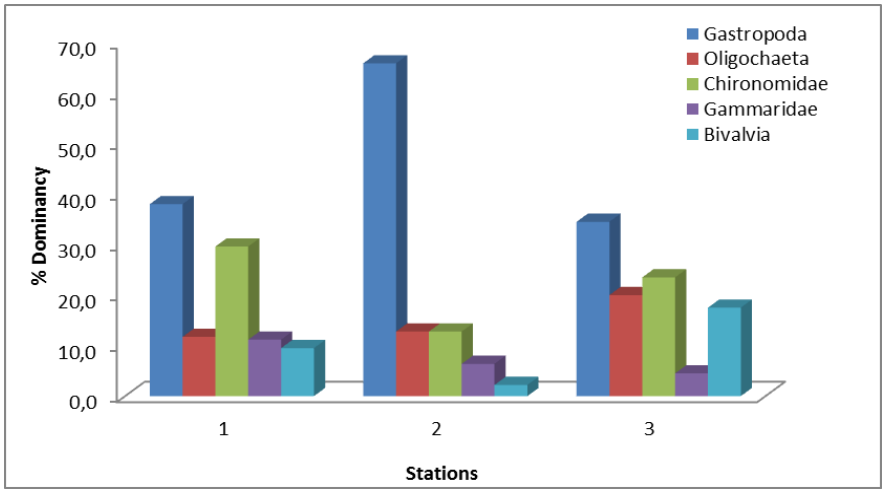

Figure 2. Distributions of benthic macroinvertebrates in the Lake Gölbaşı in the period of investigations.

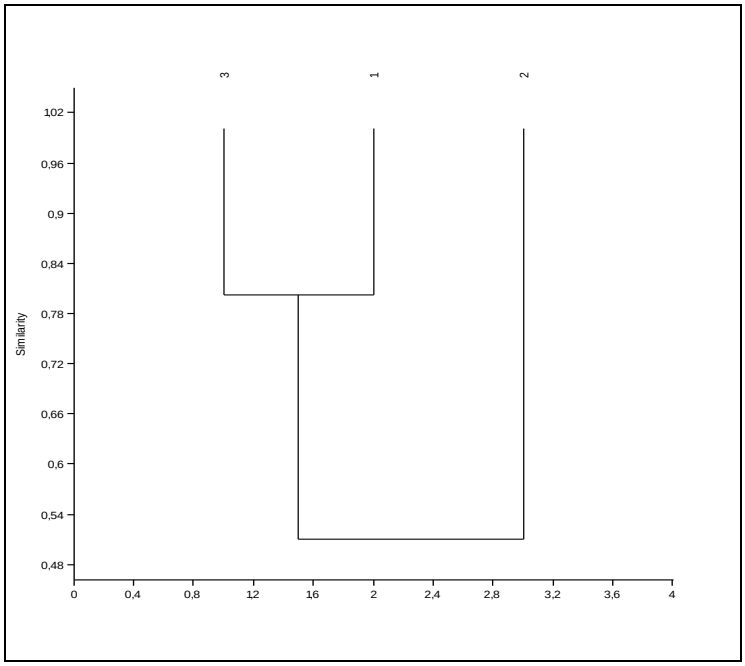

Figure 3. The dendrogram of similarity of stations in Lake Gölbaşı in respect of macrozoobenthic invertebrates distribution.

certain ranges have been observed. While *Physella acuta* is distributed throughout the world (Dillon *et al*., 2002; Taylor, 2003), *Valvata macrostoma*, according to Van Damme (2011), is widespread across northern and eastern Europe (Faltýnkova *et al*. 2008) and has also been found in Anatolia (Ustaoğlu *et al*., 2001). The genus *Melanopsis* is known as circum-Mediterranean zone inhabitants, from Gibraltar to Mesopotamia (Mouahid *et al*., 1996), but *Melanopsis costata* found in this study reported only few regions of South Anatolia and some Middle East Countries (Glöer and Pesic, 2012). Similarly, *Melanoides tuberculatus* is distributed South Asia (including south regions of Turkey: Şereflişan *et al*., 2009), Arabia, Near East and Africa (Westerlund, 1886).

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