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Contributions to the Faunistic Knowledge of Chironomidae (Diptera) of Turkey Based on the Adult Males Collected Around Hazar Lake (Elazığ)

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ABSTRACT

In the present study, adult male specimens from the non-biting midge family (Chironomidae) collected around the Hazar Lake (Elazığ, Türkiye) in 2021 were evaluated taxonomically. We collected a total of 17 species in three subfamilies of Tanypodinae, Orthocladiinae, and Chironominae. Two species *Cryptotendipes pseudotener* (Goetghebuer, 1922), and *Dicrotendipes pallidicornis* (Goetghebuer, 1934) are new faunistic records for Türkiye. 11 species were observed for the first time in the Hazar Lake, although they have been reported previously in Türkiye. These include: *Procladius (Holotanypus) choreus* (Meigen, 1804), *Cricotopus (Cricotopus) bicinctus* (Meigen, 1818), *Cricotopus (Cricotopus) festivellus* (Kieffer, 1906), *Cryptotendipes pseudotener* (Goetghebuer, 1922), *Cryptochironomus (Cryptochironomus) rostratus* Kieffer, 1921, *Dicrotendipes pallidicornis* (Goetghebuer, 1934), *Polypedilum* sp., *Polypedilum (Tripodura) bicrenatum* Kieffer, 1921, *Polypedilum (Pentapedilum) sordens* (van der Wulp, 1875), *Micropsectra radialis* Goetghebuer, 1939, and *Tanytarsus* sp.

Key words: Chironomidae, new faunistic records, Hazar Lake, Türkiye.

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INTRODUCTION

Chironomidae are an essential part of aquatic and terrestrial ecosystems where adults and immatures constitute a significant food source for invertebrates and vertebrates (Epler, 2001; Aydın & Güher, 2017). The high abundance and diversity of immature stages and their ubiquitous nature make them important bioindicators of lentic and lotic habitats (Epler, 2001; Failla, Vasquez, Hudson, Fujimoto, & Ram, 2016; Özkan et al, 2010). These ecological roles of chironomids make sampling and species-level identification an essential and helpful biological tool for biomonitoring the trophy level of a lake (Failla et al, 2016). The identification of chironomid larvae to species level can be difficult for researchers (Oliver, 1971; Failla et al, 2016). Because adults hold more developed and specific identifying features, species-level definitions are more possible to be made (Failla et al, 2016). Due to the problems with species identification based on larvae, it is recommended to evaluate the larval and adult individuals together (Namayandeh & Beresford, 2012).

In the present study, we investigated adult chironomids collected around Hazar Lake. The Hazar Lake is one of the largest and deepest lake in Eastern Anatolia of Türkiye and hosts rich biodiversity, the potential for fisheries, and bird habitats. In addition, the lake has been designated as a Wetland of International Importance under the Ramsar Convention, and some of the beaches around the lake have blue flag by the European Environmental Education Foundation (Varol, 2019). The previous studies on chironomid fauna of the lake were only on larvae (Şahin & Baysal, 1972; Tellioğlu, Çitil, & Şahin, 2008; Bakır, 2012; Sarı, 2012). Therefore, to overcome deficiencies in identifying chironomids in this important freshwater, we collected and identified adults for the first time in this study.

MATERIALS AND METHODS

The Hazar Lake is located between latitude 38° 31' N and longitude 39° 25' E (Fig. 1). It is a lake of tectonic origin and is at an altitude of 1238 m. We performed the sampling between July and August 2021 from 11 different stations around Hazar Lake (Fig. 1). The stations' names, sampling dates, and coordinates are shown in Table 1. We obtained the adult non-biting midge specimens through the reeds and grass near the lake using a sweeping net and then sprayed 70% ethanol on the collected specimens to prevent them from flying. We collected all adult chironomids kept in the sweeping net after alcohol spray with the help of a fine-lead clamp and preserved them in bottles containing 70% ethanol. We labeled all materials and transferred to the laboratory for identification. We made temporary slides in glycerine for preliminary data (subfamily, antenna structure, body coloration, thorax structure) and then done permanent preparation according to Wiederholm, 1989. We utilized Wiederholm (1989), Armitage, Cranston, & Pinder (1995), Langton & Pinder (2007), Saether & Oyewo (2008), Andersen & Mendes (2010), and Epler (2018) for the identification. We stored the materials at the Biology Department of Trakya University, Hydrobiology Laboratory, Edirne, Türkiye.

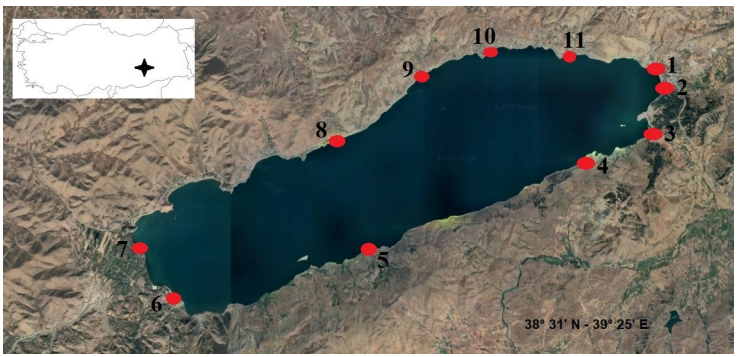

Fig. 1. The sampling stations around Hazar Lake (Elazığ), Türkiye (the numbers in the figure show the stations number in Table 1)

Table 1. Name, dates, and coordinates of the study sampling stations.

NO	Stations	Sampling Dates	Coordinates
1	The Highway Maintenance	19.07.2021, 24.07.2021, 02.08.2021, 05.08.2021, 07.08.2021	38°31'14"N, 39°30'33"E
2	Zıkkım Creek	19.07.2021, 24.07.2021, 02.08.2021, 05.08.2021, 07.08.2021	38°30'55"N, 39°30'45"E
3	Behrimaz Creek	24.07.2021, 02.08.2021, 05.08.2021, 07.08.2021	38°30'07"N, 39°30'24"E
4	Plajköy Camping	20.07.2021, 10.08.2021, 15.08.2021	38°29'36"N, 39°29'07"E
5	The Old Railroads Camping	20.07.2021, 10.08.2021, 15.08.2021	38°27'50"N, 39°23'54"E
6	Sivrice	20.07.2021, 10.08.2021, 15.08.2021	38°26'59"N, 39°18'44"E
7	Kürk Creek	20.07.2021, 10.08.2021, 15.08.2021, 18.08.2021	38°28'04"N, 39°17'43"E
8	The State Hydraulic Works Camping	22.07.2021, 10.08.2021, 15.08.2021, 18.08.2021	38°29'46"N, 39°22'26"E
9	Fırat University Camping	20.07.2021, 22.07.2021, 10.08.2021, 15.08.2021, 18.08.2021	38°01'06"N, 39°24'51"E
10	The 8. Region of Highways Camping	20.07.2021, 22.07.2021, 24.07.2021, 02.08.2021, 05.08.2021, 07.08.2021	38°31'32"N, 39°26'29"E
11	Sevsak Creek	19.07.2021, 22.07.2021, 24.07.2021, 02.08.2021	38°31'32"N, 39°28'38"E

RESULTS

We identified a total of 1103 individuals belonging to 17 species (subfamilies Tanypodinae, Orthocladiinae, and Chironominae) in this study (Table 2). We determined *Procladius (Holotanypus) choreus* (Meigen, 1804), *Cricotopus (Cricotopus) bicinctus* (Meigen, 1818), *Cricotopus (Cricotopus) festivellus* (Kieffer, 1906), *Cryptotendipes pseudotener* (Goetghebuer, 1922), *Cryptochironomus (Cryptochironomus) rostratus* Kieffer, 1921, *Dicrotendipes pallidicornis* (Goetghebuer, 1934), *Polypedilum* sp., *Polypedilum (Tripodura) bicrenatum* Kieffer, 1921, *Polypedilum (Pentapedilum) sordens* (van der Wulp, 1875), *Micropsectra radialis* Goetghebuer, 1939), and *Tanytarsus* sp.

for the first time around Hazar Lake. Also, we determined *Cryptotendipes pseudotener* (Goetghebuer, 1922) and *Dicrotendipes pallidicornis* (Goetghebuer, 1934) as new records for Turkish fauna.

Table 2. The Chironomidae species identified from Hazar Lake with their sampled station numbers (● = First record for the Hazar Lake, ♦ = First record for the Türkiye).

Taxa	Station Number
Tanypodinae	
Procladius (Holotanypus) choreus (Meigen, 1804) ●	1, 2, 3, 6, 7, 11
Tanypus (Tanypus) punctipennis Meigen, 1818	1, 7, 8, 9, 10
Orthocladiinae	
Cricotopus (Cricotopus) bicinctus (Meigen, 1818) ●	2, 3, 7, 11
Cricotopus (Cricotopus) festivellus (Kieffer, 1906) ●	1, 11
Cricotopus (Isocladius) sylvestris (Fabricius, 1794)	2, 3, 11
Chironominae	
Chironomus (Chironomus) plumosus (Linnaeus, 1758)	1, 6
Cryptotendipes pseudotener (Goetghebuer, 1922) ♦	1, 10
Cryptochironomus (Cryptochironomus) rostratus Kieffer, 1921●	1, 4, 5, 10
Dicrotendipes pallidicornis (Goetghebuer, 1934) ♦	1, 2, 3, 4, 5, 6, 7, 8, 9, 10,11
Kiefferulus (Kiefferulus) tendipediformis (Goetghebuer, 1921)	1
Polypedilum sp. ●	1
Polypedilum (Tripodura) bicrenatum Kieffer, 1921 ●	1, 4, 5, 8, 9
Polypedilum (Polypedilum) nubifer (Skuse, 1889)	3
Polypedilum (Pentapedilum) sordens (van der Wulp, 1875) ●	4, 5
Cladotanytarsus (Cladotanytarsus) mancus (Walker, 1856)	1, 4, 6, 7, 8, 9, 10
Micropsectra radialis Goetghebuer, 1939 ●	1, 2
Tanytarsus sp. ●	1, 6

Family Chironomidae

Subfamily Tanypodinae

Procladius (Holotanypus) choreus (Meigen, 1804)

Material examined: Stations 1, 2, 3, 6, 7, and 11; 233 ♂♂.

Distribution: Uluabat Lake (Arslan, Ayık, & Şahin, 2010).

Tanypus (Tanypus) punctipennis Meigen, 1818

Material examined: Stations 1, 7, 8, 9, and 10; 37 ♂♂.

Distribution: Aras, Ceyhan, Fırat rivers and Van Lake (Şahin, 1984), Eğrigöl Lake (Yıldız, Taşdemir, Özbek, Balık, & Ustaoğlu, 2005), Akşehir, Çavuşcu, Gölhisar, Karataş lakes (Taşdemir & Ustaoğlu, 2005), Büyükçekmece Lake (Koşal-Şahin, 2006), Meriç River (Özkan & Çamur-Elipek, 2006), Meriç-Ergene River Basin (Özkan and Çamur-Elipek, 2006; Aydın & Güher, 2017; Aydın & Çamur-Elipek, 2019), Musaözü Dam Lake (Arslan et al., 2007), Büyük Stream (Kara, 2008), Hazar Lake (Tellioğlu et al, 2008), Uluabat Lake (Arslan et al, 2010), Ergene River (Özkan, Moubayed, & Çamur-Elipek, 2010), Gala Lake (Çamur-Elipek et al, 2010), Delice Stream (Rüzgar, 2010), Süleymanlı Lake (Duran & Akyıldız, 2011), Erikli and Hamam lakes (Çamur-Elipek, Güher, Kırgız, & Özkan, 2012), Sapanca Lake (Bakır, 2012), Paşalimanı Island (Özkan, 2012), Karamenderes, Kocabaş, Sarıçay, Tuzla streams (Odabaşı, 2013), Gönen Stream (Taşdemir, Aydemir-Çil, & Ustaoğlu, 2018), Abant Lake (Tüzün-Tereshenko, 2019), Dicle River (Çamur-Elipek et al, 2021).

Subfamily Orthocladiinae

***Cricotopus (Cricotopus) bicinctus* (Meigen, 1818)**

Material examined: Stations 2, 3, 7, and 11; 20 ♂♂.

Distribution: Aras, Asi, Ceyhan, Fırat, Kura rivers and Van Lake (Şahin, 1984), Gümüldür Stream (Ustaoğlu, Balık, and Taşdemir, 2005), Meriç River (Özkan & Çamur-Elipek, 2006), Meriç-Ergene River Basin (Özkan & Çamur-Elipek; Aydın & Güher, 2017), Tunca River (Çamur-Elipek, Arslan, Kırgız, & Öterler, 2006), Sazlıdere Stream (Özkan & Çamur-Elipek, 2007), Delice Stream (Rüzgar, 2010), Ergene River (Özkan et al, 2010), Gala Lake (Çamur-Elipek et al, 2010), Beyşehir and Eğirdir lakes (Bakır, 2012), Erikli, Hamam, Mert lakes (Çamur-Elipek et al, 2012), Karamenderes, Kocabaş, Sarıçay, Tuzla streams (Odabaşı, 2013), Dicle River (Çetinkaya & Bekleyen, 2017), Kızılırmak and Yeşilırmak estuaries (Rüzgar, 2019), Dicle River (Çamur-Elipek, Şen, Aydın, Taş-Divrik, and Yıldırm, 2021), Büyük Menderes River Basin (Akyıldız & Duran, 2021), Kanak Dam Lake (Taş-Divrik, Öz-Laçin, Kalkan, & Yurtoğlu, 2021), Dilderesi Stream (Bayköse et al, 2022).

***Cricotopus (Cricotopus) festivellus* (Kieffer, 1906)**

Material examined: Stations 1 and 11; 16 ♂♂.

Distribution: Fırtına Stream (Abed-Abed, 2021).

***Cricotopus (Isocladius) sylvestris* (Fabricius, 1794)**

Material examined: Stations 2, 3, and 11; 13 ♂♂.

Distribution: Meriç River (Özkan & Çamur-Elipek, 2006), Meriç-Ergene River Basin (Özkan & Çamur-Elipek; Aydın & Güher, 2017), Sazlıdere Stream (Özkan & Çamur-Elipek, 2007), Ergene River (Özkan et al, 2010), Gala Lake (Çamur-Elipek et al, 2010), Delice Stream (Rüzgar, 2010), Yuvarlakçay Stream (Taşdemir, Ustaoğlu, & Balık, 2010), Uluabat Lake (Arslan et al, 2010), Kapıdağ Peninsula (Özkan, 2011), Aygır,

Beyşehir, Çıldır, Eğirdir, Erçek, Hazar, Marmara, Sıhke lakes (Bakır, 2012), Erikli, Mert lakes (Çamur-Elipek et al, 2012), Saklıgöl Lake (Taşdemir & Ustaoğlu, 2016), Yeniçağa Lake (Sönmez, 2017), Abant Lake (Tüzün-Tereshenko, 2019), Kızılırmak and Yeşilırmak estuaries (Rüzgar, 2019), Büyük Menderes River Basin (Akyıldız & Duran, 2021), Sera Lake (Abed-Abed, 2021), Dilderesi, Yalakdere streams (Bayköse et al, 2022).

Subfamily Chironominae

***Chironomus (Chironomus) plumosus* (Linnaeus, 1758)**

Material examined: Stations 1 and 6; 16 ♂♂.

Distribution: Eğrigöl Lake (Yıldız et al, 2005), Akşehir, Beyşehir, Çavuşcu, Eber, Eğirdir, Gölhisar, Karamık, Karataş lakes (Taşdemir & Ustaoğlu, 2005), Büyükçekmece Lake (Koşal-Şahin, 2006), Meriç River (Özkan & Çamur-Elipek, 2006), Meriç-Ergene River Basin (Özkan & Çamur-Elipek; Aydın & Güher, 2017; Aydın & Çamur-Elipek, 2019), Tunca River (Çamur-Elipek et al, 2006), Hazar Lake (Tellioğlu et al, 2008), Büyük Stream (Kara, 2008), Kesikköprü Dam Lake (Ahıska, 2009), Delice Stream (Rüzgar, 2010), Ergene River (Özkan et al, 2010), Gala Lake (Çamur-Elipek et al, 2010), Tahtalı Dam Lake (Taşdemir, Yıldız, Özbek, Ustaoğlu, & Balık, 2010), Yuvarlakçay Stream (Taşdemir et al, 2010), Uluabat Lake (Arslan et al, 2010), Kapıdağ Peninsula (Özkan, 2011), Süleymanlı Lake (Duran and Akyıldız, 2011), Erikli, Hamam, Mert lakes (Çamur-Elipek et al, 2012), Paşalimanı Island (Özkan, 2012), Sapanca Lake (Bakır, 2012), Karamenderes, Kocabaş, Sarıçay, streams (Odabaşı, 2013), Gökçeova, Karagöl, Kartal lakes (Taşdemir & Ustaoğlu, 2016), Yeniçağa Lake (Sönmez, 2017), Abant Lake (Tüzün-Tereshenko, 2019), Yeşilırmak estuaries (Rüzgar, 2019), Uzungöl Lake (Abed-Abed, 2021), Dicle, Fırat rivers (Çamur-Elipek et al, 2021), Kanak Dam Lake (Taş-Divrik et al, 2021).

***Cryptotendipes pseudotener* (Goetghebuer, 1922) (Fig. 2A)**

Material examined: Stations 1 and 10; 21 ♂♂.

Distribution: We could not find any distributional records of this secies in Türkiye. In Europe the species is reported from Hungary (Mora, 2004), Finland (Paasivirta, 2014), Ireland (Murray, O'Connor, & Ashe, 2018), and Italy (Rossaro et al, 2019).

Diagnosis: Wing membrane bare, squama at the base of wing is fringed with seta. Eye bare and frontal tubercles absent. Palp well-developed. Antepronotum notched dorsally. Scutum is not overreaching antepronotum. Apex of fore tibia bears low and rounded projection. Combs of mid and hind tibiae narrowly separated and each bearing a spur. Pulvilli large and distinct. Inferior volsella absent. Anal tergite without processes next to the anal point. Anal point long, extending past mid-point of gonostylus. Superior volsella rod-like. Gonostylus long and incurved but not much swollen basally. Gonostylus with no apical tooth (Fig. 2A).

***Cryptochironomus (Cryptochironomus) rostratus* Kieffer, 1921**

Material examined: Stations 1, 4, 5, and 10; 56 ♂♂.

Distribution: Ereğli- Konya (Reiss, 1985).

***Dicrotendipes pallidicornis* (Goetghebuer, 1934) (Fig. 2B)**

Material examined: Stations 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11; 336 ♂♂.

Distribution: We could not find any distributional records of this species in Türkiye. In Europe the species is reported from France (Moubayed-Breil, 2007), Crete, Corsica, Great Britain, Ireland, the Netherlands, and Spain (Murray et al, 2018).

Diagnosis: Wing membrane bare, squama at the base of wing with long seta. Wing membrane with dark markings. Eye bare. Antepronotal lobes narrow and weakly notched medially. Scutum is not overreaching antepronotum. Fore tibia rounded scale and lacking spur. Combs of mid and hind tibiae composed of basally fused spinules and each with a long spur. Pulvilli simple, lobe-like, and as long as claw. Inferior volsella of the hypopygium distinctly forked at the tip (Fig. 2B).

***Kiefferulus (Kiefferulus) tendipediformis* (Goetghebuer, 1921)**

Material examined: Station 1; 2 ♂♂.

Distribution: Meriç-Ergene River Basin (Özkan and Çamur-Elipek; Aydın & Güher, 2017; Aydın & Çamur-Elipek, 2019), Kayalı Stream (Özkan, 2007), Hazar Lake (Bakır, 2012; Sarı, 2012), Marmara Lake (Bakır, 2012).

***Polypedilum* sp.**

Material examined: Station 1; 9 ♂♂.

***Polypedilum (Tripodura) bicrenatum* Kieffer, 1921**

Material examined: Stations 1, 4, 5, 8, and 9; 69 ♂♂.

Distribution: Ceyhan, Çoruh, Fırat, Kura rivers and Van Lake (Şahin, 1984), Meriç River (Özkan & Çamur-Elipek, 2006), Meriç-Ergene River Basin (Özkan & Çamur-Elipek; Aydın & Güher, 2017), Tunca River (Çamur-Elipek et al, 2006), Kayalı, Kiremitlik, Masıt, Münipbey, Pınarbaşı streams and Tayfur Dam Lake (Özkan, 2007), Kapıdağ Peninsula (Özkan, 2011).

***Polypedilum (Polypedilum) nubifer* (Skuse, 1889)**

Material examined: Station 3; 2 ♂♂.

Distribution: Dicle and Fırat rivers (Şahin, 1984), Beyşehir and Eğirdir lakes (Taşdemir & Ustaoğlu, 2005), Eğrigöl Lake (Yıldız et al, 2005), Gümüldür Stream (Ustaoğlu et al, 2005), Büyükçekmece Lake (Koşal-Şahin, 2006), Kovada Lake (Arslan & Şahin, 2006), Meriç River (Özkan & Çamur-Elipek, 2006), Meriç-Ergene River Basin (Özkan & Çamur-Elipek; Aydın & Güher, 2017; Aydın & Çamur-Elipek, 2019), Tunca River (Çamur-Elipek et al, 2006), Kocabaş Stream (Özkan, 2007), Büyük Stream (Kara, 2008), Delice Stream (Rüzgar, 2010), Ergene River (Özkan et al, 2010),

Kapıdağ Peninsula (Özkan, 2011), Gala, Çemek, Hazar, Marmara lakes (Bakır, 2012), Paşalimanı Island (Özkan, 2012), Karamenderes, Kocabaş, Tuzla streams (Odabaşı, 2013), Kufi Stream (Özcan, 2013), Kartal Lake (Taşdemir & Ustaoğlu, 2016), Abant Lake (Tüzün-Tereshenko, 2019).

***Polypedilum (Pentapedilum) sordens* (van der Wulp, 1875)**

Material examined: Stations 4 and 5; 11 ♂♂.

Distribution: Kovada Lake (Arslan & Şahin, 2006), Meriç-Ergene River Basin (Özkan & Çamur-Elipek), Gala Lake (Çamur-Elipek et al, 2010), Beyşehir Lake (Bakır, 2012; Sarı, 2012), Gölbaşı Lake (Arslan, Kara, & Odabaşı, 2013), Yeniçağa Lake (Sönmez, 2017), Yeşilırmak estuaries (Rüzgar, 2019).

***Cladotanytarsus (Cladotanytarsus) mancus* (Walker, 1856)**

Material examined: Stations 1, 6, 7, 8, 9, and 10; 169 ♂♂.

Distribution: Aras, Asi, Ceyhan, Çoruh rivers and Van Lake (Şahin, 1984), Beyşehir (Taşdemir & Ustaoğlu, 2005), Büyükçekmece Lake (Koşal-Şahin, 2006), Meriç River (Özkan & Çamur-Elipek, 2006), Meriç-Ergene River Basin (Özkan & Çamur-Elipek; Aydın & Güher, 2017; Aydın & Çamur-Elipek, 2019), Tunca River (Çamur-Elipek et al, 2006), Musaözü Dam Lake (Arslan et al., 2007), Münipbey, Pınarbaşı streams and Tayfur Dam Lake (Özkan, 2007), Sazlıdere Stream (Özkan & Çamur-Elipek, 2007), Büyük Stream (Kara, 2008), Hazar Lake (Tellioğlu et al, 2008), Delice Stream (Rüzgar, 2010), Ergene River (Özkan et al, 2010), Gala Lake (Çamur-Elipek et al, 2010), Kapıdağ Peninsula (Özkan, 2011), Beyşehir, Çıldır, Hazar, Sapanca lakes (Bakır, 2012), Sihke Lake (Sarı, 2012), Gölbaşı Lake (Arslan et al, 2013), Karamenderes, Kocabaş, Tuzla streams (Odabaşı, 2013), Kufi Stream (Özcan, 2013), Gökçeova Lake (Taşdemir & Ustaoğlu, 2016), Yeniçağa Lake (Sönmez, 2017), Abant Lake (Tüzün-Tereshenko, 2019), Yeşilırmak estuaries (Rüzgar, 2019), Dicle and Fırat rivers (Çamur-Elipek et al, 2021), Abdal, Aksu, Çataklıhoca, Fol, Hemşin, İkizdere, Karadere, Solaklı streams (Abed-Abed, 2021), Dilderesi, Kirazdere, Yalakdere (Bayköse et al, 2022).

***Micropsectra radialis* Goetghebuer, 1939**

Material examined: Stations 1 and 2; 82 ♂♂.

Distribution: Banaz Stream (Özcan, 2013), Kanak Dam Lake (Taş-Divrik et al, 2021),

***Tanytarsus* sp.**

Material examined: Stations 1 and 6; 11 ♂♂

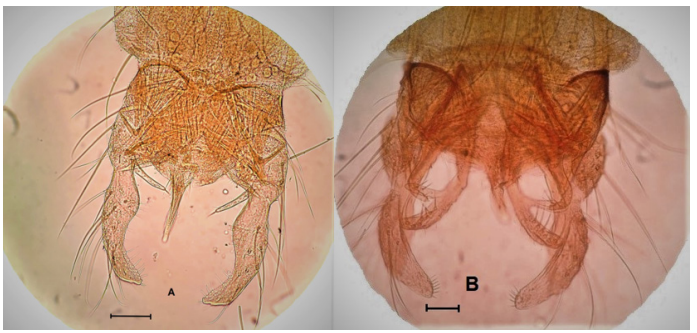

Fig. 2. The hypopygia of A: *Cryptotendipes pseudotener*, B: *Dicrotendipes pallidicornis* (the scale lines represent a distance of 40 µm).

CONCLUSIONS AND DISCUSSION

In this study, adult male chironomids from the Hazar Lake in Elazığ, Türkiye were investigated. Hazar Lake is an internationally important freshwater within the scope of the Ramsar Convention (1971). The previous studies conducted in this lake have only been based on the identification of larval stage with a total of 24 chironomid species being identified so far (Şahin & Baysal, 1972; Tellioğlu et al, 2008; Bakır, 2012; Sarı, 2012). As a result of this investigation, we recorded a total of 11 species from three subfamilies of Chironomidae for the first time from the Hazar Lake increasing the number to 35. Chironominae was found to be the richest and most abundant subfamily in this freshwater with 12 species and 71% of all specimens with a total of 784 individuals (Table 2). This was followed by the subfamily Tanypodinae (25% with 270 individuals). The subfamily Orthocladiinae was found to be represented with the lowest individual numbers (4% with 49 individuals) (Fig. 3).

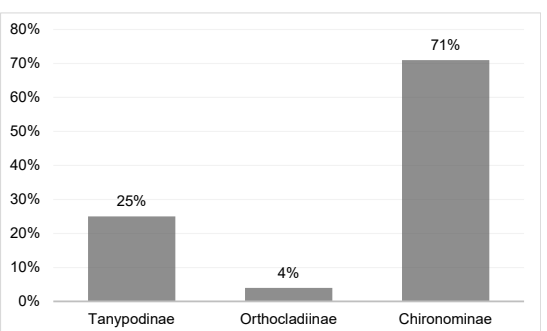

Fig. 3. The percentage of subfamilies by number of individuals.

The newly recorded *D. pallidicornis* had the highest abundance, with 336 individuals, among the species collected. The larvae of *D. pallidicornis* are tolerant of saline conditions (Murray et al, 2018). Previous studies reported saline conditions in the lake (Ünlü, Çoban, & Tunç, 2007; Rashid, 2022).

Limnologists generally use chironomid larvae to evaluate and monitor environmental conditions, the levels of organic pollution in streams, rivers, and wetlands (Kang, Baek, Kang, & Bae, 2022). However, chironomid larvae are usually difficult to identify to species level because compared to the immatures, the adult chironomids possess more developed and distinguishing features for species-level identification (Kang et al, 2022). Therefore, to build on the previous studies conducted on larval stages we obtain the data on the faunistic knowledge of adult Chironomidae; further facilitating the future studies on the ecology, distribution, and life history of chironomids of the region.

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