

To Cite: Polat, A., Yıldız, N., Manav, T. & İncekara, Ü. (2025). New Faunistic Records of Helophoridae, Hydrochidae, and Hydrophilidae (Coleoptera) from the Wetland Habitats of Tekirdağ Province, Türkiye. *Journal of the Institute of Science and Technology*, 15(4), 1571-1582.

New Faunistic Records of Helophoridae, Hydrochidae, and Hydrophilidae (Coleoptera) from the Wetland Habitats of Tekirdağ Province, Türkiye

Ahmet POLAT^{1*}, Numan YILDIZ¹, Tahir MANAV¹, Ümit İNCEKARA¹

Highlights:

- Tekirdağ
- Systematic
- Hydrophilidae

Keywords:

- Tekirdağ
- Systematic
- Fauna
- Polyphaga
- Hydrophilidae

ABSTRACT:

Turkey's diverse climate and altitudinal variations support a wide range of habitats, contributing to its rich biological diversity. However, faunistic studies on aquatic beetles, particularly those belonging to the families Helophoridae, Hydrochidae, and Hydrophilidae, remain limited in the wetland ecosystems of Tekirdağ province. To address this knowledge gap, extensive field surveys were conducted in various wetland habitats between September 2022 and July 2023.

As a result of these investigations, a total of 38 taxa were identified, comprising 7 species, 1 subspecies from the Helophoridae family, 1 species from the Hydrochidae family, and 28 species, 1 subspecies from the Hydrophilidae family. The findings revealed that all recorded taxa represent new records for Tekirdağ province. This study provides a significant contribution to the faunistic inventory of aquatic beetles in the region and establishes a valuable foundation for a better understanding of the biodiversity of wetland ecosystems in Tekirdağ.

¹Ahmet POLAT ([Orcid ID: 0000-0002-5172-9753](https://orcid.org/0000-0002-5172-9753)), ¹Numan YILDIZ ([Orcid ID: 0000-0002-0581-4770](https://orcid.org/0000-0002-0581-4770)),

¹Tahir MANAV ([Orcid ID: 0009-0007-2303-4472](https://orcid.org/0009-0007-2303-4472)), ¹Ümit İNCEKARA ([Orcid ID: 0000-0002-3283-5841](https://orcid.org/0000-0002-3283-5841)), Atatürk University, Faculty of Science, Department of Biology, Erzurum, Türkiye

***Corresponding Author:** Ahmet POLAT, e-mail: ahmetpolat@atauni.edu.tr

A part of this article was presented orally under the title of “A Faunistic Research on The Helophoridae and Hydrophilidae Families of İkiz Lakes (Tekirdağ)” at the “7th Symposium on Euroasian Biodiversity” held in Erzurum on 22-24 August 2024.

INTRODUCTION

The Helophoridae family occupies a wide range of habitats, from sea level to high mountain peaks, and is represented by 201 species worldwide (Angus, 1992, 1996, 1998; İncekara et al., 2004). Among these, 156 species are found in the Palearctic region (Angus, 1992; Taşar, 2018a), 41 species are distributed in the Nearctic region (Smetana, 1985; Hansen, 1987), and only four species have been recorded in the Ethiopian region (Angus, 1992). In Turkey, 51 species of this family have been identified so far (Darılmaz & İncekara, 2011; Polat et al., 2021).

The Hydrochidae family, which is distributed across all zoogeographical regions, is represented by a single genus and 87 species (Angus, 1977; Hansen, 1987, 1999; Hebauer & Klausnitzer, 1998; Valladares et al., 1999). In the Palearctic region, the family includes 27 species and 2 subspecies, while 8 species have been recorded in Turkey (Darılmaz & İncekara, 2011; Taşar, 2017, 2018a, 2018b; Polat et al., 2021).

The Hydrophilidae family is a large group distributed worldwide, comprising 172 genera and 2932 species. In Turkey, 100 species and 3 subspecies have been recorded, showing a strong resemblance to the Asian fauna (Kosswing, 1995; Mart et al., 2014; Taşar, 2017, 2018a; Polat et al., 2021).

The most comprehensive study on the distribution of these families in Turkey was conducted by Polat et al. in 2021. This study contributed to the literature by adding new records from Tekirdağ province.



Figure 1. The Map of the Studing Area

MATERIALS AND METHODS

In the study area, various aquatic habitats were identified, including coastal zones, slow-flowing streams and creeks, as well as wetlands with high levels of vegetative decomposition. A total of 46 localities were sampled across these regions, considering seasonal variations (Table 2). Sampling was conducted between September 2022 and July 2023 using a sieve, net, and scoop with a pore diameter of 2 mm.

Collected insect specimens were euthanized using ethyl acetate and subsequently transported to the laboratory for further analysis. For species identification, aedeagophores were treated with a 10% KOH solution for 1–2 hours to dissolve the surrounding muscle tissue, exposing the chitinous structure. The structures were then placed on slides with a drop of glycerin for microscopic examination. Measurements were obtained by drawing aedeagophore shapes under a Nikon SMZ1500 stereomicroscope. Additionally, photographs of common and distinguishing morphological features were taken using a Leica DFC295 microscope.

Following detailed measurements and morphological assessments, species identification was completed. The identified specimens were labeled and deposited in the Zoology Museum of the Biology Department, Faculty of Science, Atatürk University.

Table 1. Locality Numbers and Coordinates of the Collected Samples

Locality number	Coordinates
T1	41°21'47"N 28°03'12"E, 205 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T2	41°22'08"N 27°54'15"E, 118 m. Büyük Ağıl, Saray, Tekirdağ, 13.09.2022
T3	41°22'05"N 28°04'32"E, 216 m. Kostalan deresi, Çerkezköy, Tekirdağ, 13.09.2022
T4	41°23'02"N 27°55'55"E, 134 m. Büyük Yoncalık, Saray, Tekirdağ, 13.09.2022
T5	41°21'59"N 28°02'52"E, 201 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T6	41°21'58"N 28°02'52"E, 207 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T7	41°21'58"N 28°02'48"E, 204 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T8	41°21'54"N 28°02'43"E, 200 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T9	41°21'47"N 28°02'46"E, 206 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T10	41°21'48"N 28°02'43"E, 212 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T11	41°21'48"N 28°03'14"E, 221 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T12	41°21'49"N 28°03'13"E, 217 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T13	41°21'52"N 28°03'16"E, 202 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T14	41°21'46"N 28°03'08"E, 202 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T15	41°21'45"N 28°03'09"E, 206 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T16	41°21'44"N 28°03'11"E, 204 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.09.2022
T17	41°35'11"N 28°05'55"E, 431 m. Kastro deresi, Bahçeköy, Saray, Tekirdağ, 14.09.2022
T18	41°03'33"N 27°02'57"E, 86 m. Umurbey, Hayrabolu, Tekirdağ, 16.09.2022
T19	40°46'43"N 27°08'08"E, 114 m. Sağlamtaş, Malkara, Tekirdağ, 17.09.2022
T20	41°00'27"N 27°57'13"E, 41 m. Kamara dere, Marmara ereğlisi, Tekirdağ, 18.09.2022
T21	41°22'04"N 28°04'32"E, 192 m. Kostalan Deresi, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T22	41°21'46"N 28°03'11"E, 203 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T23	41°21'59"N 28°02'52"E, 201 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T24	41°21'58"N 28°02'52"E, 207 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T25	41°21'58"N 28°02'48"E, 204 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T26	41°21'54"N 28°02'43"E, 200 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T27	41°21'47"N 28°02'46"E, 206 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T28	41°21'48"N 28°02'43"E, 212 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T29	41°21'48"N 28°03'14"E, 221 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T30	41°21'49"N 28°03'13"E, 217 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T31	41°21'52"N 28°03'16"E, 202 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T32	41°21'46"N 28°03'08"E, 202 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T33	41°21'45"N 28°03'09"E, 206 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T34	41°21'44"N 28°03'11"E, 204 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 04.06.2023
T35	41°04'01"N 27°37'59"E, 81 m. Maksutlu, Marmara Ereğlisi, Tekirdağ, 05.06.2023
T36	41°04'58"N 27°53'51"E, 85 m. Yakuplu, Çorlu, Tekirdağ, 05.06.2023
T37	41°06'45"N 27°33'03"E, 180 m. Kepenekli, Marmara Ereğlisi, Tekirdağ, 05.06.2023

Table 2. Locality Numbers and Coordinates of the Collected Samples (Continued)

T38	41°01'52"N 27°53'27"E, 47 m. Türkmeneli Gölü, Marmara Ereğlisi, Tekirdağ, 05.06.2023
T39	41°01'30"N 27°10'49"E, 135 m. Kazandere, İsmaili, Hayrabolu, Tekirdağ, 07.06.2023
T40	40°57'40"N 27°00'42"E, 80 m. Evrenbey, Malkara, Tekirdağ, 07.06.2023
T41	41°02'22"N 27°03'09"E, 79 m. Yörgüç, Şarköy, Tekirdağ, 07.06.2023
T42	41°12'54"N 27°14'35"E, 60 m. Dambaslar, Hayrabolu, Tekirdağ, 07.06.2023
T43	41°04'51"N 27°10'12"E, 111 m. Eşekbahçan Deresi, Parmaksız, Hayrabolu, Tekirdağ, 07.06.2023
T44	40°57'17"N 27°01'52"E, 83 m. Evrenbey, Malkara, Tekirdağ, 07.06.2023
T45	41°17'33"N 27°01'46"E, 116 m. Çerkezmüşellim, Hayrabolu, Tekirdağ, 08.06.2023
T46	41°15'20"N 27°02'43"E, 12 m. Çerkezmüslim Barajı, Hayrabolu, Tekirdağ, 08.06.2023
T47	41°19'21"N 27°03'21"E, 54 m. Suvat Deresi, Karakavak, Hayrabolu, Tekirdağ, 08.06.2023
T48	40°57'40"N 27°00' 44"E, 102 m. Karademir Barajı, Evrenbey, Malkara, Tekirdağ, 08.06.2023
T49	41°09'08"N 27 01' 37"E, 60 m. Örey, Hayrabolu, Tekirdağ, 08.06.2023
T50	41°22'05"N 28°04'32"E, 198 m. Kostalan Deresi, Kapaklı, Tekirdağ, 13.07.2023
T51	41°21'07"N 28°00'18"E, 65 m. Kazak göleti, Kapaklı, Tekirdağ, 13.07.2023
T52	41°26'20"N 28°05'23"E, 227 m. Mavi Göl, Safaalan, Saray, Tekirdağ, 13.07.2023
T53	41°21'46"N 28°03'12"E, 202 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T54	41°21'59"N 28°02'52"E, 201 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T55	41°21'58"N 28°02'52"E, 207 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T56	41°21'58"N 28°02'48"E, 204 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T57	41°21'54"N 28°02'43"E, 200 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T58	41°21'47"N 28°02'46"E, 206 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T59	41°21'48"N 28°02'43"E, 212 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T60	41°21'48"N 28°03'14"E, 221 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T61	41°21'49"N 28°03'13"E, 217 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T62	41°21'52"N 28°03'16"E, 202 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T63	41°21'46"N 28°03'08"E, 202 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T64	41°21'45"N 28°03'09"E, 206 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T65	41°21' 44"N 28°03' 11"E, 204 m. İkizgöller, Pınarca, Kapaklı, Tekirdağ, 13.07.2023
T66	41°19'22"N 27°03'23"E, 65 m. Karakavak, Hayrabolu, Tekirdağ, 14.07.2023

RESULTS AND DISCUSSION

All data obtained in this study represent the first records for the research region. The findings are presented below. When providing the distribution of species across Turkey, the sequence follows the numerical order of the provinces' traffic plate codes (Table 2).

Table 2. Provinces and Codes Used in Their Distribution in Türkiye

PROVINCES	CODES	PROVINCES	CODES
Adana	01	Konya	42
Adıyaman	02	Kütahya	43
Afyon	03	Malatya	44
Ağrı	04	Manisa	45
Amasya	05	Kahramanmaraş	46
Ankara	06	Mardin	47
Antalya	07	Muğla	48
Artvin	08	Muş	49
Aydın	09	Nevşehir	50
Balıkesir	10	Niğde	51
Bilecik	11	Ordu	52
Bingöl	12	Rize	53
Bitlis	13	Sakarya	54
Bolu	14	Samsun	55

Table 2. Provinces and Codes Used in Their Distribution in Türkiye (Continued)

Burdur	15	Siirt	56
Bursa	16	Sinop	57
Çanakkale	17	Sivas	58
Çankırı	18	Tekirdağ	59
Çorum	19	Tokat	60
Denizli	20	Trabzon	61
Diyarbakır	21	Tunceli	62
Edirne	22	Şanlıurfa	63
Elazığ	23	Uşak	64
Erzincan	24	Van	65
Erzurum	25	Yozgat	66
Eskişehir	26	Zonguldak	67
Gaziantep	27	Aksaray	68
Giresun	28	Bayburt	69
Gümüşhane	29	Karaman	70
Hakkari	30	Kırıkkale	71
Hatay	31	Batman	72
Isparta	32	Şırnak	73
Mersin	33	Bartın	74
İstanbul	34	Ardahan	75
İzmir	35	Iğdır	76
Kars	36	Yalova	77
Kastamonu	37	Karabük	78
Kayseri	38	Kilis	79
Kırklareli	39	Osmaniye	80
Kırşehir	40	Düzce	81
Kocaeli	41		

Familya: Helophoridae***Helophorus aquaticus*** (Linnaeus, 1758)

Examined samples: Tekirdağ: T27, T29, T30, T31, T41, T45, T47, T48, T49, T53, T54, T58, T59, T60

Distribution in Turkey: 01, 02, 03, 06, 09, 11, 12, 14, 15, 16, 19, 20, 21, 22, 23, 25, 28, 29, 30, 32, 33, 34, 36, 37, 38, 39, 42, 43, 44, 46, 47, 49, 52, 54, 55, 57, 63, 64, 65, 68, 69, 72, 73 (Yıldız et al., 2020; Aydın et al., 2021; Mart & İlkaya 2021; Özcan et al., 2021; Polat et al., 2021; Bektaş et al., 2022; Taşar, 2023; Akünel, 2024).

It is the first record from Tekirdağ.

Helophorus discrepans Rey, 1885

Examined samples: Tekirdağ: T36

Distribution in Turkey: 03, 06, 07, 08, 14, 19, 20, 21, 23, 24, 25, 28, 29, 30, 36, 38, 43, 46, 49, 52, 60, 61, 64, 65, 66, 69 (Mart & İlkaya 2021; Özcan et al., 2021; Polat et al., 2021).

It is the first record from Tekirdağ.

Helophorus frater d'Orchymont, 1926

Examined samples: Tekirdağ: T35

Distribution in Turkey: 21, 23, 24, 25, 28, 29, 30, 35, 38, 55, 60, 65, 69 (Mart & İlkaya 2021; Polat et al., 2021).

It is the first record from Tekirdağ.

Helophorus griseus Herbst, 1793

Examined samples: Tekirdağ: T37, T39, T45, T60

Distribution in Turkey: 03, 09, 14, 16, 19, 22, 24, 25, 28, 29, 34, 38, 43, 52, 55, 60, 65 (Polat et al., 2021).

It is the first record from Tekirdağ.

Helophorus obscurus Mulsant, 1844

Examined samples: Tekirdağ: T31, T41, T43, T45, T61, T62

Distribution in Turkey: 03, 08, 09, 14, 16, 19, 20, 24, 25, 28, 32, 34, 35, 38, 49, 43, 44, 52, 55, 57, 60, 61, 64 (Polat et al., 2021).

It is the first record from Tekirdağ.

Helophorus arvernensis Mulsant, 1846

Examined samples: Tekirdağ: T21, T36, T38

Distribution in Turkey: 19, 21, 24, 25, 29, 36, 38, 55, 60, 65 (Polat et al., 2021).

It is the first record from Tekirdağ.

Helophorus brevipalpis brevipalpis Bedel, 1881

Examined samples: Tekirdağ: T37, T39, T40, T41, T42, T43, T45, T47, T49

Distribution in Turkey: 02, 03, 06, 07, 08, 09, 10, 15, 16, 19, 20, 21, 22, 24, 25, 28, 29, 32, 34, 35, 36, 38, 39, 42, 43, 44, 45, 46, 48, 51, 52, 55, 57, 63, 61, 64, 65, 68, 69, 72 (Yıldız et al., 2020; Aydın et al., 2021; Özcan et al., 2021; Polat et al., 2021; Bektaş et al., 2022; Akünel, 2024).

It is the first record from Tekirdağ.

Helophorus montenegrinus Kuwert, 1885

Examined samples: Tekirdağ: T21, T22, T23, T34, T37, T45, 53, T54

Distribution in Turkey: 06, 10, 14, 15, 16, 23, 25, 28, 32, 33, 34, 35, 37, 39, 43, 46, 49, 52, 55, 57, 60, 61 (Yıldız et al., 2020; Özcan et al., 2021; Polat et al., 2021).

It is the first record from Tekirdağ.

Familya: Hydrochidae***Hydrochus flavipennis*** Kuster, 1852

Examined samples: Tekirdağ: T50

Distribution in Turkey: 02, 03, 12, 20, 21, 25, 43, 44, 46, 49, 60, 63, 65 (Özcan et al., 2021; Polat et al., 2021; Taşar, 2023).

It is the first record from Tekirdağ.

Familya: Hydrophilidae***Anacaena limbata*** (Fabricius, 1792)

Examined samples: Tekirdağ: T17, T25, T36

Distribution in Turkey: 02, 03, 06, 07, 12, 19, 20, 21, 23, 28, 29, 43, 52, 58, 61, 65, 66, 69 (Mart & İlkaya 2021; Polat et al., 2021).

It is the first record from Tekirdağ.

Berosus affinis Brullé, 1835

Examined samples: Tekirdağ: T3

Distribution in Turkey: 01, 02, 03, 07, 15, 16, 17, 20, 22, 31, 33, 34, 35, 37, 38, 39, 41, 42, 43, 45, 48, 52, 54, 55, 64 (Aydın et al. 2021; Polat et al., 2021).

It is the first record from Tekirdağ.

Berosus luridus (Linnaeus, 1761)

Examined samples: Tekirdağ: T51

Distribution in Turkey: 03, 08, 20, 24, 25, 30, 32, 36, 37, 38, 52, 55, 60, 69 (Polat et al., 2021).

It is the first record from Tekirdağ.

Berosus guttalis Rey, 1883

Examined samples: Tekirdağ: T47

Distribution in Turkey: 13, 49, 58, 65 (Özcan et al., 2021; Polat et al., 2021).

It is the first record from Tekirdağ.

Berosus spinosus (Steven, 1808)

Examined samples: Tekirdağ: T47

Distribution in Turkey: 01, 03, 06, 07, 09, 12, 19, 20, 22, 23, 24, 25, 33, 35, 36, 38, 40, 43, 44, 55, 58, 65, 68, 69 (Polat et al., 2021; Bektaş et al., 2022).

It is the first record from Tekirdağ.

Cymbiodyta marginella (Fabricius, 1792)

Examined samples: Tekirdağ: T52, T53

Distribution in Turkey: 02, 03, 20, 23, 32, 38, 43, 55, 58, 65 (Polat et al., 2021).

It is the first record from Tekirdağ.

Enochrus melanocephalus (Olivier, 1792)

Examined samples: Tekirdağ: T43

Distribution in Turkey: 02, 03, 20, 24, 33, 43, 61, 68 (Polat et al., 2021).

It is the first record from Tekirdağ.

Enochrus bicolor (Fabricius, 1792)

Examined samples: Tekirdağ: T19

Distribution in Turkey: 02, 03, 06, 07, 09, 10, 15, 17, 20, 21, 22, 23, 24, 25, 33, 35, 36, 38, 40, 43, 44, 45, 49, 52, 58, 63, 64, 65, 68 (Yıldız et al., 2020; Özcan et al., 2021; Polat et al., 2021).

It is the first record from Tekirdağ.

Enochrus fuscipennis (Thomson, 1884)

Examined samples: Tekirdağ: T2, T4, T15, T25, T29, T41, T45

Distribution in Turkey: 03, 06, 08, 09, 10, 12, 15, 16, 17, 19, 20, 21, 23, 24, 25, 28, 29, 30, 31, 32, 35, 36, 38, 42, 43, 44, 45, 49, 52, 53, 58, 64, 65, 68, 69 (Mart & İlkaya 2021; Özcan et al., 2021; Polat et al., 2021; Aydoğan et al., 2022; Bektaş et al., 2022; Taşar 2023; Akünel, 2024).

It is the first record from Tekirdağ.

Enochrus ochropterus (Marsham, 1802)

Examined samples: Tekirdağ: T2, T19

Distribution in Turkey: 02, 14, 21, 23, 63, 65 (Polat et al., 2021).

It is the first record from Tekirdağ.

Enochrus quadripunctatus (Herbst, 1797)

Examined samples: Tekirdağ: T15, T32, T39, T41, T45, T48, T62

Distribution in Turkey: 02, 07, 12, 20, 21, 22, 23, 25, 32, 35, 36, 42, 44, 45, 47, 49, 52, 58, 63, 65, 72 (Mart & İlkaya 2021; Özcan et al., 2021; Polat et al., 2021; Bektaş et al., 2022; Taşar 2023; Akünel, 2024).

It is the first record from Tekirdağ.

Enochrus testaceus (Fabricius, 1801)

Examined samples: Tekirdağ: T39, T40

Distribution in Turkey: 03, 10, 17, 20, 23, 32, 33, 38, 43, 63 (Polat et al., 2021).

It is the first record from Tekirdağ.

Enochrus affinis (Thunberg, 1794)

Examined samples: Tekirdağ: T21, T8

Distribution in Turkey: 01, 02, 27, 31, 46, 79, 80 (Polat et al., 2021).

It is the first record from Tekirdağ.

Enochrus nigritus (Sharp, 1872)

Examined samples: Tekirdağ: T10, T21, T28, T49, T52, T56, T57

Distribution in Turkey: 03, 20, 34, 39 (Polat et al., 2021).

It is the first record from Tekirdağ.

Helochares lividus (Forster, 1771)

Examined samples: Tekirdağ: T1, T2, T3, T4, T5, T6, T7, T9, T11, T13, T17, T18, T20, T21, T24, T25, T37, T39, T43, T45, T47, T50, T52, T53, T55, T66

Distribution in Turkey: 01, 02, 03, 06, 10, 12, 15, 19, 20, 21, 22, 23, 25, 31, 32, 35, 43, 44, 45, 46, 52, 55, 58, 60, 61, 63, 64, 68 (Polat et al., 2021).

It is the first record from Tekirdağ.

Helochares obscurus (O. F. Müller, 1776)

Examined samples: Tekirdağ: T1, T19

Distribution in Turkey: 01, 02, 03, 06, 10, 12, 15, 17, 20, 21, 23, 25, 28, 31, 32, 35, 38, 42, 43, 46, 47, 49, 52, 54, 55, 58, 63, 69 (Özcan et al., Polat et al., 2021; 2021; Bektaş et al., 2022; Akünel, 2024;).

It is the first record from Tekirdağ.

Helochares punctatus Sharp, 1869

Examined samples: Tekirdağ: T1, T3, T18, T21, T52, T50

Distribution in Turkey: 03, 08, 15, 19, 20, 21, 32, 35, 42, 43, 45 (Polat et al., 2021; Akünel, 2024).

It is the first record from Tekirdağ.

Hydrobius fuscipes (Linnaeus, 1758)

Examined samples: Tekirdağ: T28, T36, T42, T46, T50, T52, T60

Distribution in Turkey: 02, 03, 06, 08, 11, 12, 15, 19, 20, 21, 23, 24, 25, 28, 29, 30, 31, 32, 33, 35, 36, 38, 42, 43, 49, 52, 53, 55, 58, 60, 61, 72 (Mart & İlkaya 2021; Özcan et al., 2021; Polat et al., 2021; Aydoğan et al., 2022; Bektaş et al., 2022; Akünel, 2024).

It is the first record from Tekirdağ.

Limnoxenus niger (Gmelin, 1790)

Examined samples: Tekirdağ: T15, T21, T25, T39, T57,

Distribution in Turkey: 02, 03, 07, 09, 16, 20, 38, 43, 55, 58, 60, 64 (Polat et al., 2021).

It is the first record from Tekirdağ.

Hydrochara caraboides (Linnaeus, 1758)

Examined samples: Tekirdağ: T42

Distribution in Turkey: 03, 21, 25, 32, 35, 38, 45, 47, 55, 58, 60, 63, 69, 72 (Polat et al., 2021; Bektaş et al., 2022).

It is the first record from Tekirdağ.

Hydrochara flavipes (Steven, 1808)

Examined samples: Tekirdağ: T40, T49, T61

Distribution in Turkey: 01, 03, 06, 20, 21, 22, 38, 43, 55, 63, 64, 68 (Aydın et al., 2021; Polat et al., 2021)

It is the first record from Tekirdağ.

Laccobius bipunctatus (Fabricius, 1775)

Examined samples: Tekirdağ: T20

Distribution in Turkey: 02, 03, 08, 12, 14, 19, 21, 23, 25, 28, 29, 32, 36, 37, 42, 43, 49, 52, 58, 61, 63, 69, 72 (Özcan et al., 2021; Polat et al., 2021; Aydoğan et al., 2022; Akünel, 2024).

It is the first record from Tekirdağ.

Laccobius obscuratus aegaeus Gentili, 1974

Examined samples: Tekirdağ: T52

Distribution in Turkey: 01, 02, 03, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 23, 24, 25, 28, 29, 31, 32, 33, 34, 35, 37, 38, 39, 41, 42, 43, 45, 48, 51, 52, 53, 55, 57, 58, 60, 61, 64, 65, 69, 80 (Özcan et al., 2021; Polat et al., 2021; Akünel, 2024).

It is the first record from Tekirdağ.

Laccobius simulatrix d'Orchymont, 1932

Examined samples: Tekirdağ: T1, T2, T4

Distribution in Turkey: 01, 03, 04, 06, 07, 08, 09, 10, 12, 13, 14, 16, 17, 19, 20, 21, 22, 23, 24, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 51, 52, 55, 58, 60, 61, 64, 65, 66, 68, 69, 80 (Polat et al., 2021; Aydoğan et al., 2022; Bektaş et al., 2022; Taşar 2023; Akünel, 2024).

It is the first record from Tekirdağ.

Laccobius striatulus (Fabricius, 1801)

Examined samples: Tekirdağ: T2, T4, T17, T19

Distribution in Turkey: 03, 06, 07, 08, 10, 11, 12, 13, 14, 16, 17, 20, 23, 25, 26, 28, 29, 31, 32, 34, 35, 38, 41, 42, 43, 44, 45, 46, 48, 52, 54, 55, 58, 60, 61, 69 (Polat et al., 2021; Bektaş et al., 2022; Akünel, 2024).

It is the first record from Tekirdağ.

Laccobius syriacus Guillebeau, 1896

Examined samples: Tekirdağ: T13, T18, T45, T52

Distribution in Turkey: 01, 02, 03, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 42, 43, 44, 45, 46, 47, 48, 49, 52, 53, 54, 55, 57, 58,

60, 61, 63, 64, 65, 68, 69, 72, 80 (Mart & İlkaya 2021; Özcan et al., 2021; Polat et al., 2021; Aydoğan et al., 2022; Bektaş et al., 2022; Akünel, 2024).

It is the first record from Tekirdağ.

Laccobius gracilis Motschulsky, 1855

Examined samples: Tekirdağ: T2, T4, T19, T22, T53

Distribution in Turkey: 01, 02, 03, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 41, 42, 43, 44, 45, 46, 47, 48, 49, 51, 52, 53, 55, 57, 58, 60, 61, 63, 64, 65, 66, 69, 72, 73, 79 (Polat et al., 2021; Aydoğan et al., 2022; Bektaş et al., 2022; Taşar, 2023; Akünel, 2024).

It is the first record from Tekirdağ.

Coelostoma orbiculare (Fabricius, 1775)

Examined samples: Tekirdağ: T1, T8, T13, T17, T27, T28, T36, T52, T53, T62, T63

Distribution in Turkey: 02, 03, 06, 07, 08, 12, 15, 16, 17, 19, 20, 21, 23, 25, 28, 29, 32, 33, 36, 38, 43, 45, 52, 55, 58, 60, 61, 63, 65, 69 (Mart & İlkaya 2021; Polat et al., 2021; Aydoğan et al., 2022; Bektaş et al., 2022).

It is the first record from Tekirdağ.

Cercyon circumcinctus Reitter, 1889d

Examined samples: Tekirdağ: T38

Distribution in Turkey: 01, 02, 03, 20, 32, 35, 38 (Polat et al., 2021).

It is the first record from Tekirdağ.

CONCLUSION

This study, conducted in Tekirdağ province between September 2022 and July 2023, aimed to contribute to the faunistic knowledge of aquatic beetles by examining the species composition of the Helophoridae, Hydrochidae, and Hydrophilidae families. During the study, a total of 38 species were identified, including 7 species and 1 subspecies from the Helophoridae, 1 species from the Hydrochidae, and 28 species and 1 subspecies from the Hydrophilidae. Notably, all identified species were recorded for the first time in Tekirdağ province, highlighting the region's previously undocumented biodiversity in terms of aquatic Coleoptera.

The findings of this research provide an important contribution to updating the distributional records of these three families in Turkey. Given that previous studies on these families have largely focused on different regions of the country, the addition of new locality records from Tekirdağ significantly enriches the understanding of their geographic range. Moreover, the study underscores the importance of wetlands and freshwater ecosystems in supporting a diverse assemblage of aquatic beetles, emphasizing the need for further research and conservation efforts.

By documenting these new records and revising the known distribution of species, this study not only enhances the existing taxonomic and faunistic data on Turkish aquatic beetles but also serves as a valuable reference for future biodiversity assessments and ecological studies in the region.

ACKNOWLEDGEMENTS

This study was supported by Atatürk University Scientific Research Projects Coordination Office with project number 2022/10950 and was carried out in Atatürk University, Faculty of Science, Department of Biology.

Conflict of Interest

The article authors declare that there is no conflict of interest between them.

Author's Contributions

The authors declare that they have contributed equally to the article.

REFERENCES

- Akünel, A. (2024). Ecological factors affecting distribution of the aquatic beetles (Coleoptera: Hydrophilidae, Helophoridae) of Beyşehir Lake and adjacent areas in Turkey. *Inland Water Biology*, 17(2), 271–278.
- Angus, R. B. (1977). A re-evaluation of the taxonomy and distribution of some European species of Hydrochus Leach (Coleoptera: Hydrophilidae). *Entomologist's Monthly Magazine*, 112, 177–201.
- Angus, R. B. (1992). Süßwasserfauna von Mitteleuropa (Insecta: Coleoptera: Hydrophilidae: Helophorinae). *Jena: Gustav Fischer Verlag*.
- Angus, R. B. (1996). A re-evaluation of the Helophorus flavipes group of species (Coleoptera: Hydrophilidae), based on chromosomal analysis, larva and biology. *Nouvelle Revue d'Entomologie (N.S.)*, 13, 111–122.
- Angus, R. B. (1998). A new Turkish Helophorus, with notes on H. griseus Herbst and H. montanus d'Orchymont (Coleoptera: Hydrophiloidea). *Entomologist's Monthly Magazine*, 134, 5–9.
- Aydın, G. B., Çamur-Elipék, B., & Topkara, E. T. (2021). Contributions to the knowledge on aquatic/semi-aquatic Coleoptera (Insecta) fauna of Turkey with first records in Turkish Thrace. *Journal of the Entomological Research Society*, 23(2), 157–172.
- Aydoğan, Z., İncekara, Ü., Şişman, T., Darılmaz, M. C., & Aksakal, Ö. (2022). Investigation of the distribution of aquatic entomofauna (Coleoptera) affected by Murgul copper mine area, with new faunistic records in Artvin. *Journal of the Institute of Science and Technology*, 12(2), 578–588.
- Bektaş, M., Orhan, F., & Barış, O. (2022). Isolation of biological control agents and biotechnological bacteria from aquatic insect gut microbiota (Coleoptera: Helophoridae, Hydrophilidae). *Biology Bulletin*, 49(6), 596–608.
- Darılmaz, M. C., & İncekara, Ü. (2011). Checklist of Hydrophiloidea of Turkey (Coleoptera: Polyphaga). *Journal of Natural History*, 45(11), 685–735.
- Hansen, M. (1987). The Hydrophilidae (Coleoptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica*, 18, 1–253.
- Hansen, M. (1999). World catalogue of insects. Hydrophiloidea (Coleoptera) (Vol. 2). *Stenstrup: Apollo Books*.
- Hebauer, F., & Klausnitzer, B. (1998). Süßwasserfauna von Mitteleuropa 20/7, 8, 9, 10. Insecta: Coleoptera: Hydrophiloidea (Exkl. Helophorus). Berlin: *Spektrum Akademischer Verlag*.
- İncekara, Ü., Mart, A., & Erman, O. (2004). Distribution of Turkish Helophorus Fabricius, 1775 (Coleoptera; Helophoridae) I. Subgenus Rhopalhelophorus, with two new records. *Journal of the Entomological Research Society*, 6(2), 51–62.
- Kosswig, C. (1995). Zoogeography of the Near East. *Systematic Zoology*, 4(1–4), 48–96.
- Mart, A., & İlkaya, M. (2021). Faunistic investigation of Diyarbakır Province in terms of Hydrophilidae and Helophoridae (Coleoptera) families. *Türk Tarım ve Doğa Bilimleri Dergisi*, 8(2), 353–363.

- Mart, A., Aydoğan, A., & Fırat, Z. (2014). A contribution on zoogeographical distribution of Hydrophilidae species in Turkey. *Munis Entomology and Zoology*, 9(2), 842–847.
- Özcan, S., Yıldız, N., Polat, A., & İncekara, Ü. (2021). Erzurum jeolojik oluşumları ve Muş Hamurpet Gölü Helophoridae, Hydrochidae, Hydrophilidae (Coleoptera) üzerine faunistik bir çalışma. *Journal of the Institute of Science and Technology*, 11(1), 75–90.
- Polat, A., Darılmaz, M. C., & İncekara, Ü. (2020). An annotated checklist of the Hydrophiloidea (Coleoptera) of Turkey. *Munis Entomology and Zoology*, 16(1), 151–178.
- Smetana, A. (1985). Revision of the subfamily Helophorinae of the Nearctic region (Coleoptera: Hydrophilidae). *Memoirs of the Entomological Society of Canada*, 131, 1–151.
- Taşar, G. E. (2017). Hydrophiloidea (Coleoptera: Helophoridae, Hydrochidae and Hydrophilidae) fauna of Adıyaman Province. *Kahramanmaraş Sütçü İmam Üniversitesi Doğa Bilimleri Dergisi*, 20(2), 103–110.
- Taşar, G. E. (2018a). Contributions to the knowledge of aquatic Coleoptera fauna (Dryopidae, Helophoridae, Heteroceridae, Hydrochidae, Hydrophilidae, Gyrinidae, Haliplidae and Noteridae) of Diyarbakır, Mardin and Batman Provinces. *Turkish Journal of Fisheries and Aquatic Sciences*, 18, 927–936.
- Taşar, G. E. (2018b). Investigations on the Hydrophiloidea (Coleoptera: Helophoridae, Hydrochidae and Hydrophilidae) fauna of Şanlıurfa Province. *Kahramanmaraş Sütçü İmam Üniversitesi Tarım ve Doğa Dergisi*, 21(2), 111–118.
- Taşar, G. E. (2023). Malatya ili sucul böcek (Coleoptera) faunası bilgisine katkılar. *Eurasian Journal of Biological and Chemical Sciences*, 6(1), 12–15.
- Valladares, L. F., Diaz, A. J., & Delgado, A. J. (1999). *Hydrochus ibericus* sp. n. (Coleoptera: Hydrochidae) from the Iberian Peninsula. *Aquatic Insects*, 21(2), 81–87.
- Yıldız, N., Özcan, S., Polat, A., & İncekara, Ü. (2020). A faunistic study of Polyphaga (Helophoridae ve Hydrophilidae) families in Erzurum swamps, Turkey. *Anatolian Journal of Biology*, 1(1), 1–7.