

GERROMORPHAN FAUNA OF ÇORUM PROVINCE IN TURKEY (INSECTA: HETEROPTERA)

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ABSTRACT: As a result of revised literatures for determination of the Gerromorphan fauna of Çorum province and a scientific excursion in Çorum province between the years 2006-2008, 9 Gerromorphan species were found. All species are new records to Çorum province and the Black Sea Region of Turkey.

KEY WORDS: Heteroptera, Gerromorpha, Gerridae, Hydrometridae, Veliidae, Çorum, Turkey.

Çorum province is in the Black Sea Region of Turkey (Fig. 1). The research area is located in 39°53', 41°20'N North latitude and 33°57' - 35°33' East longitude and the altitude of Çorum is between about 800 m-1600 m. As a result of the researching reviewed literatures on Turkish Gerromorphan insects, it was determined that any taxa are known in Çorum. The aim of this study is to determine the Gerromorphan fauna of Çorum.

384 specimens were collected with field guides between April-September in 2006-2008 in Çorum located in Black Sea Region of Turkey. 9 species belong to 4 genus of 3 families in infraorder Gerromorphan were determined. One species of Veliidae, one species of Hydrometridae and seven species of Gerridae were collected from 15 localities in various aquatic habitats of the Çorum province. Phenologies and distributions of determined species in the study area were given. Distributions of each species were given in two categories, distributions in Turkey and distributions in the world. All species are here recorded for the first time from Çorum and the Black Sea Region of Turkey. Distributions in Turkey of species are shown on a separate map for each species (Fig. 2-10).

MATERIALS AND METHODS

The samples were collected from various aquatic habitats, with either a sieve, ladle or water-net having a 1 mm mesh size. The samples were killed with 70% alcohol. The genital apparatus were dissected under the stereo-microscope and left in 10% KOH solution for about 20-30 minutes. All the specimens were deposited in a private collection of the authors.

The samples were diagnosed using identification keys (Bei-Bienko, 1967; Poisson, 1949; 1957; Rabitsch, 2005, Stichel, 1958 - 1960, Savage, 1989). Former general distributional records from Turkey were given for each species (Hoberlandt, 1948, 1955; Seidenstucker, 1957, Özsmi and Önder, 1988, Kiyak, 2000, Kiyak and Özsarac, 2001, Kiyak et al., 2004, 2007). Distributional records on the world were also given for all species (Aukema and Reiger, 1995; Hoberlandt, 1948, 1955; Rabitsch, 2005, Stichel, 1958 - 1960).

Information about the localities and the country codes are given below.

Localities : (Loc.1): Beydili village (marsh), 40° 37' N 34° 53' E; (Loc.2): Boğazönü village (bridge), 40° 19' N 34° 18' E; (Loc.3): Çatak (national park), 40° 41' N 34° 18' E; (Loc.4): Çorum dam, 40° 34' N 34° 59' E; (Loc.5): Göcenovacıği village (small lake), 40° 20' N 34° 50' E; (Loc.6): Gökçeşinar village (small lake), 40° 22' N 35° 08' E; (Loc.7): Hatap (stream), 40° 23' N 34° 48' E; (Loc.8): İskilip (18. km road of İskilip-small stream), 40° 34' N 34° 45' E; (Loc.9): Kadıkırı village (stream), 40° 28' N 34° 52' E; (Loc.10): Kayı village (stream), 40° 24' N 35° 00' E; (Loc.11): Kızılırmak (40. km road of İskilip- small stream), 40° 37' N 34° 34' E; (Loc.12): Obruk dam, 40° 46' N 34° 47' E; (Loc.13): Sarılık bridge- small stream, 40° 23' N 35° 04' E; (Loc.14): Seydim (Seydim Lake), 40° 33' N 34° 44' E; (Loc.15): Türkler village (stream), 40° 38' N 34° 52' E.

Country Codes: A: Austria, AA: Açores, AFG: Afghanistan, AK: Albania, AND: Andora, ARM: Armenia, AUT: Palestine, AZ: Azerbaijan, B: Belgium, BAE: Balear Islands, BG: Bulgaria, BSB: West Siberia, BY: Belarus, CH: Switzerland, CHN: China, CNL: Channel Islands, CRA: Canary Islands, CRC: Corsica, CZ: Czech Republic, CY: Cyprus, D: Germany, DK: Denmark, DSB: EAST Siberia, DZ: Algeria, E: Spain, EST: Estonia, ET: Egypt, F: France, FIN: Finland, FL: Liechtenstein, GB: England, GBCHN: Southwest China, GBAS: Southwest Asia, GE: Georgia, GDCHN: Southeast China, GI: Crete, GR: Greece, GRUS: South Russia, GKO: South Korea, H: Hungary, HG: Hong Kong, HKJ: Jordan, HN: Croatia, I: Italy, IL: Israel, IR: Iran, IRL: Ireland, IRQ: Iraq, ISK: Scotland, J: Japan, KRUS: : North Russia, KS: Kirghizistan, KZ: Kazakhstan, KBCHN: Northwest China, KCHN: North China, KDCHN: Northeast China, KKO: North Korea, L: Luxembourg, LT: Lithuania, LV: Latvia, M: Malta, MA: Morocco, MD: Moldavia, MGL: Mongolia, MK: Macedonia, MNK: Monaco, MO: Makao, N: Norway, NL: Netherlands, OCHN: Middle China, ORUS: Middle Russia, P: Portugal, PL: Poland, RC: Taiwan, RL: Lebanon, RN: Rumania, RP: Philippines, RUS: Russia, S: Sweden, SBR: Siberia, SCL: Sicily, SGP: Slovakia, Sİ: Sinai, SLO: Slovenia, SM: San Marino, SRD: Sardinia, SYR: Syria, TJ: Tajikistan, TKT: Turkestan, TM: Turkmenistan, TN: Tunisia, TR: Turkey, TRK: Transcaucasia, UA: Ukraine, UD: Far East, UZ: Uzbekistan, YU: Yugoslavia.

RESULTS

Ordo Heteroptera

Infraorder Gerromorpha (Popov, 1971)

Family Veliidae (Brullé, 1836)

Velia caprai (Kolenati, 1857)

Phenology: July .

Material Examined: 1♂, (Loc.15), 01.07.2006.

Distribution in Turkey (Fig. 2): Kırşehir, Antalya, Aydın, Burdur, Isparta, Muğla (Kiyak et al., 2001, 2008).

Distribution in the world:: AND, A, B, CZ, DK, F, GB, D, GR, H, IRL, I, FL, L, NL, N, PL, P, RN, SGP, E, S, CH, YU [6]. (Aukema and Reiger, 1995; Rabitsch, 2005).

Family Hydrometridae (Billberg, 1820)

Hydrometra stagnorum (Linnaeus, 1758)

Phenology: July and September.

Materials Examined: 2♂♂, 3♀♀, (Loc.9), 07.07.2007; 3♀♀, (Loc.2), 21.07.2007; 1♀, (Loc.13), 28.07.2007; 1♂, (Loc.2), 05.08.2007; 1♂, (Loc.7), 05.08.2007; 2♂♂, 1♀, (Loc.13),

12.08.2007; 1♂, 2♀♀, (Loc.2), 18.08.2007; 6♂♂, 3♀♀, (Loc.7), 18.08.2007; 1♀, (Loc.13) 25.08.2007; 3♂♂, 12♀♀, (Loc.7), 09.09.2007.

Distribution in Turkey (Fig. 3): Adana, Afyon, Ankara, Antalya, Aydın, Bitlis, Bolu, Bulgar dağı, Burdur, Bursa, Denizli, Isparta, İzmir, Kırşehir, Muğla, Turunçlu (Hoberland, 1948, 1955; Kiyak, 2000; Kiyak et al., 2004, 2008).

Distribution in the world: : AFG, D, AK, A, AA, AZ, B, BG, DZ, CZ, DK, ARM, MA, RP, AUT, FIN, F (CRC and MNK included), GE, HN, NL, IRQ, GB (CNL included), IR, IRL, ISK, E, IL, S, CH, I (SRD, SCL and SM included), CRA, KZ, CY, KS, FL, L, H, MK, ET?, N, UZ, PL, P, RN, GRUS, SRD, SBR, SCL, SGP, SYR, TJ, TRK, TN, TKT, TR, TM, UA, YU, GR (GI included) (Aukema and Reiger, 1995; Hoberlandt, 1948, 1955; Rabitsch, 2005, Stichel, 1958 - 1960).

Family Gerridae (Leach, 1815)

Gerris argentatus (Schummel, 1832)

Phenology: June and July.

Materials Examined: 1♂, 1♀, (Loc.1), 03.06.2006; 3♂♂, 2♀♀, (Loc.6), 15.07.2007.

Distribution in Turkey (Fig. 4): Adana, Antalya, Aydın, Burdur, Denizli, Isparta, Kayseri, Muğla (Hoberland, 1948; Kiyak et al., 2008; Özsesmi and Önder, 1988).

Distribution in the world: D, AK, A, AZ, LT, EST, B, BG, DZ, CZ, DK, MA, AUT, FIN, F (CRC and MNK included), GE, NL, IRQ, GB (CNL included), IR, IRL, ISK, E, IL, S, CH, I (SRD, SCL and SM included), KZ, CY, KS, LV, FL, H, MK, MGL, MD, N, UZ, PL, RN, GRUS, ORUS, KRUS, DSB, BSB, SGP, SLO, SYR, TJ, TRK, TN, TKT, TR, TM, UA, YU, GR (GI included) (Aukema and Reiger, 1995; Hoberlandt, 1948; Rabitsch, 2005; Stichel, 1958 - 1960).

Gerris asper (Fieber, 1860)

Phenology: May and August.

Materials Examined: 1♂, 1♀, (Loc.5), 23.06.2007; 1♂, (Loc.10), 15.07.2007; 1♀, (Loc.13), 25.08.2007; 2♀♀, (Loc.3), 15.05.2008.

Distribution in Turkey (Fig. 5): Adana (Seidenstücker, 1957).

Distribution in the world: A, BG, HN?, CZ, F (CRC and MNK included), D, H, I (SRD, SCL and SM included), MK, PL, RN, GRUS, SGP, SLO, E?, CH, UA, YU, TR, IL, SYR, DZ?, MA (Aukema and Reiger, 1995; Seidenstücker, 1957).

Gerris lacustris (Linnaeus, 1758)

Phenology: April and September.

Materials Examined: 1♀, (Loc.3), 03.06.2006; 1♂, (Loc.3), 01.07.2006; 1♂, (Loc.15), 01.07.2006; 1♂, 2♀♀, (Loc.1), 01.07.2006; 2♂, 1♀, (Loc.3), 10.07.2006; 1♀, (Loc.13), 15.07.2007; 1♀, (Loc.10), 15.07.2007; 1♀, (Loc.2), 05.08.2007; 2♂♂, (Loc.10), 12.08.2007; 1♂, (Loc.2), 18.08.2007; 1♀, (Loc.7), 18.08.2007; 1♂, 1♀, (Loc.10), 25.08.2007; 2♂♂, 3♀♀, (Loc.7), 09.09.2007; 6♂♂, 10♀♀, (Loc.2), 26.04.2008; 2♂♂, 1♀, (Loc.1), 15.05.2008; 1♂, (Loc.5), 03.07.2008; 20♂♂, 15♀♀, (Loc.7), 03.07.2008.

Distribution in Turkey (Fig. 6): Afyon, Antalya, Aydın, Bolu, Burdur, Denizli, Gaziantep, Isparta, İstanbul, Muğla, Sakarya (Hoberland, 1948; Kiyak et al., 2004, 2008).

Distribution in the world: D, A, LT, EST, BY, B, BG, DZ, CZ, KDCHN, KBCHN, KCHN, DK, MA, FIN, F (CRC and MNK included), GE, HN, NL, GB (CNL included), IR, IRL, ISK, E, S, CH, I (SRD, SCL and SM included), J, KZ, KKO, GKO, LV, FL, L, H, MK, ET- Sí? MGL, MD, N, PL, P, RN, GRUS, ORUS, KRUS, DSB, UD, BSB, SGP, SLO, TR, UA, YU, GR (GI included) (Aukema and Reiger, 1995; Hoberlandt, 1948; Rabitsch, 2005; Stichel, 1958 - 1960).

Gerris thoracicus (Schummel, 1832)

Phenology: April, May, August and September.

Materials Examined: 1♂, (Loc.3), 05.08.2006; 4♂♂, 2♀♀, (Loc.15), 05.08.2006; 2♂♂, 1♀, (Loc.15), 19.08.2006; 7♂♂, 5♀♀, (Loc.3), 19.08.2006; 2♀♀, (Loc.7), 05.08.2007; 1♂, (Loc.2), 05.08.2007; 2♂♂, 4♀♀, (Loc.2), 18.08.2007; 1♀, (Loc.7), 18.08.2007; 1♂, (Loc.2),

09.09.2007; 2♂♂, 3♀♀, (Loc.7), 09.09.2007; 1♀, (Loc.13), 12.08.2007; 5♂♂, 4♀♀, (Loc.2), 26.04.2008; 1♂,1 (Loc.4), 29.04.2008; 1♀, (Loc.1), 15.05.2008; 1♀, (Loc.3), 15.05.2008.

Distribution in Turkey (Fig. 7): Adana, Afyon, Ankara, Antalya, Armutlu, Aydın, Burdur, Bursa, Denizli, Edirne, Isparta, İzmir, Kırşehir, Muğla (Hoberland, 1948; Kiyak et al., 2004, 2008; Seidenstücker, 1957).

Distribution in the world: AFG, D, A, AZ, BAE, LT, EST, B, BG, DZ, CZ, DK, ARM, MA, FIN, F (CRC and MNK included), GE, HN, NL, IRQ, GB (CNL included), IR, IRL, ISK, E, IL, S, CH, I (SRD, SCL and SM included), CRA, KZ, CY, CRC, LV, FL, RL, L, H, MK, M, MD, N, UZ, PL, P, RN, GRUS, ORUS, KRUS, SGP, SLO, SYR, T.J, TRK, TN, TKT, TR, TM, UA, YU, GR (Aukema and Reiger, 1995; Hoberlandt (1948), Rabitsch, 2005; Seidenstücker, 1957, Stichel, 1958 - 1960).

Gerris gibbifer (schummel, 1832)

Phenology: May and July.

Materials Examined: 2♂♂, (Loc.2), 07.07.2007; 2♂♂, (Loc.1), 15.05.2008; 1♀, (Loc.8), 21.05.2008.

Distribution in Turkey (Fig. 8): Antalya, Aydın, Burdur, Denizli, Isparta, Muğla (Kiyak et al., 2007).

Distribution in the world: A, B, CZ, DK, F, GB, D, H, I, FL, L, NL, PL, P, SGP, SLO, E, S, CH, UA (Aukema and Reiger, 1995; Rabitsch, 2005).

Gerris costae (Herrich-Schaffer,1850)

Phenology: May and August.

Materials Examined: 1♂, (Loc.15), 03.06.2006; 1♀, (Loc.3), 03.06.2006; 9♂♂, 3♀♀, (Loc.15), 01.07.2006; 6♂♂, 2♀♀, (Loc.3), 01.07.2006; 1♂, (Loc.1), 01.07.2006; 2♂♂, 1♀, (Loc.3), 10.07.2006; 2♂♂, 3♀♀, (Loc.1), 10.07.2006; 8♂♂, 9♀♀, (Loc.15), 10.07.2006; 4♂♂, 18♀♀, (Loc.3), 29.07.2006; 2♂♂, 3♀♀, (Loc.15), 29.07.2006; 16♂♂, 19♀♀, (Loc.3), 05.08.2006; 1♀ (Loc.15), 05.08.2006; 1♀, (Loc.14), 05.08.2006; 2♂♂, 2♀♀, (Loc.3), 19.08.2006; 1♂, 2♀♀, (Loc.7), 23.06.2007; 1♂, 2♀♀, (Loc.7), 07.07.2007; 6♂♂, 5♀♀, (Loc.2), 07.07.2007; 1♂, 1♀, (Loc.5), 07.07.2007; 10♂♂, 8♀♀, (Loc.2), 21.07.2007; 6♂♂, 9♀♀, (Loc.7), 21.07.2007; 1♀, (Loc.10), 28.07.2007; 1♀, (Loc.13), 12.08.2007; 2♀♀, (Loc.1), 15.05.2008.

Distribution in Turkey (Fig. 9): Ankara, Antalya, Aydın, Burdur, Bursa, Çankırı, Denizli, Isparta, İzmir, Kırşehir, Kocaeli, Muğla, Niğde, Sultandağları (Çete, 2000; Hoberland, 1948; Kiyak et al., 2004, 2008).

Distribution in the world: GBAS, TRK, SYR, AUT, A, CZ, D, I, FL, SLO, CH (Aukema and Reiger, 1995; Hoberlandt, 1948).

Aquarius paludum (Fabricius, 1794)

Phenology: June and August.

Materials Examined: 1♂, (Loc.14), 30.06.2006; 4♂♂, 4♀♀, (Loc.14), 10.07.2006; 1♂, 1♀, (Loc.14), 29.07.2006; 2♂♂, 2♀♀, (Loc.14), 05.08.2006; 1♂, (Loc.11), 19.07.2008; 2♂♂, 3♀♀, (Loc.12), 04.08.2008.

Distribution in Turkey (Fig. 10): Adana, Afyon, Antalya, Aydın, Burdur, Denizli, Edirne, İçel, Isparta, Muğla, Niğde (Hoberland, 1948; Kiyak et al., 2004, 2008).

Distribution in the world: D, AK, A, AZ, LT, EST, BY, B, BG, CZ, OCHN, KDCHN, KCHN, KBCHN, GDCHN (MO, HG included), GBCHN, DK, ARM, AUT, FIN, F (CRC and MNK included), GE, NL, IRQ, GB (CNL included), IR, E, IL, S, CH, I (SRD, SCL and SM included), J, KZ, KKO, GKO, LV, FL, RL, L, H, MD, N, UZ, PL, RN, GRUS, ORUS, KRUS, DSBR, BSBR, UD, SGP, SLO, SYR, T.J, RC, TRK, TKT, TR, TM, UA, HKJ, YU, GR (GI included) (Aukema and Reiger, 1995; Hoberlandt, 1948; Rabitsch, 2005; Stichel, 1958 - 1960).

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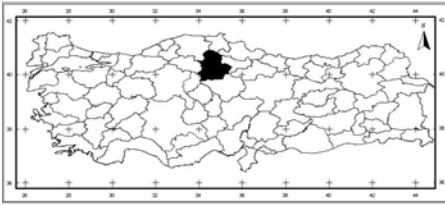


Fig.1 Map of Turkey. Corum is marked with black.

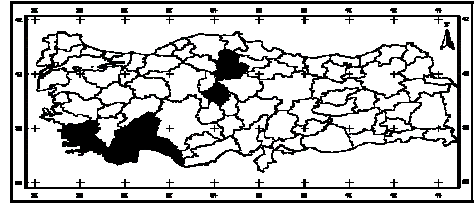


Fig.2 *Velia caprai* (Kolenati, 1857)

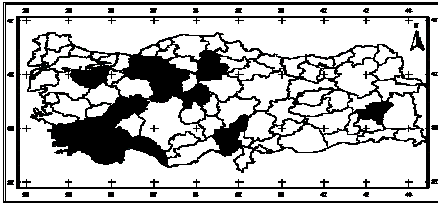


Fig. 3. *Hydrometra stagnorum* (Linnaeus, 1758)

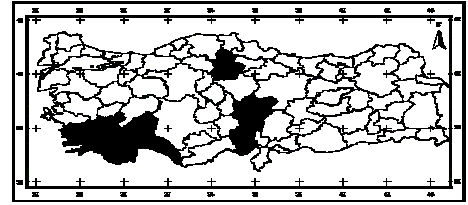


Fig. 4. *Gerris argentatus* (Schummel, 1832)

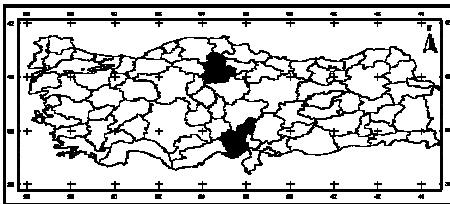


Fig. 5. *Gerris asper* (Fieber, 1860)

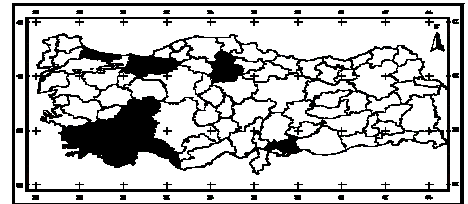


Fig. 6. *Gerris lacustris* (Linnaeus, 1758)

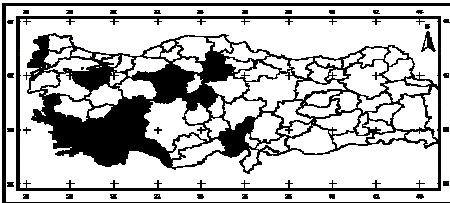


Fig. 7. *Gerris thoracicus* (Schummel, 1832)

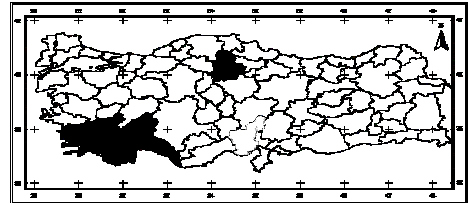


Fig. 8. *Gerris gibbifer* (Schummel, 1832)

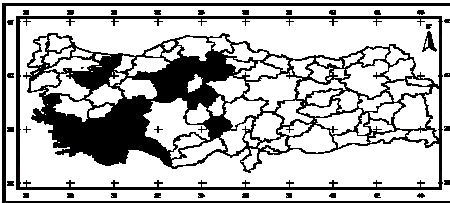


Fig. 9. *Gerris costae* (Herrich-Schaffer, 1850)

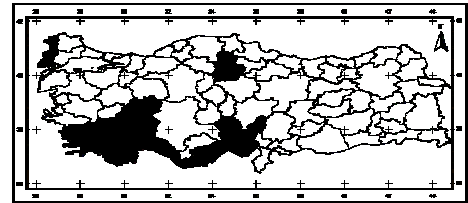


Fig. 10. *Aquarius paludum* (Fabricius, 1794)