

An overview of the *Gammarus* Fabricius (Gammaridae: Amphipoda) species of Turkey, with an updated checklist

Murat Özbek

Abstract. The genus *Gammarus* Fabricius, 1775 is represented in Turkey by 38 species. Only four of them occur in marine or brackish habitats and the remaining species are pure freshwater species. Some of them adopted to living in extreme habitats, such as wells, cave waters etc. An updated list of *Gammarus* taxa reported from Turkey is presented in addition to some supplementary records.

Key words. Freshwater, Amphipoda, *Gammarus*, distribution, Anatolia, Turkey.

Introduction

Among the various amphipod genera, *Gammarus* Fabricius is probably the genus with the highest number of epigeic freshwater species (KARAMAN & PINKSTER 1977a, b). Species belonging to this genus inhabit both the marine and freshwater environment. The number of species living in freshwater is greater than that of the marine species. The genus is represented by about 130 species worldwide (HOU & LI 2004). The *Gammarus* fauna of freshwaters in southern Europe and Turkey is indeed very rich (KARAMAN 1973). The amphipod fauna of Turkish freshwaters has been the object of intensive studies by several scientists. The pioneering study on the subject was by VAVRA (1905), which includes the description of *Gammarus argaeus* Vavra, 1905 from Erciyes Mountain, Kayseri province. Subsequent studies were conducted by KARAMAN (1971, 1973, 1975a, b), KARAMAN & PINKSTER (1977a, b 1987), PINKSTER & KARAMAN (1978), MATEUS & MATEUS (1990), KRAPP-SCHICKEL et al. (1994), YEŞİLMEN & KIRGÖZ (1996), ÖZBEK & GÜLOĞLU (2005), ÖZBEK (2007), ÖZBEK & BALIK (2009), and ÖZBEK et al. (2009). The latest study on the *Gammarus* fauna of Turkish freshwaters is by ÖZBEK & ÇAMUR-ELİPEK (2010), who described a new species, *Gammarus kesanensis*, from Erikli Fountain, Keşan.

In this study, the author aims to contribute to knowledge of the distribution of the genus *Gammarus* in Turkey. For this, all the recorded species are listed and their distribution patterns are investigated in detail. The collecting locations of all the species reported from Turkey were compiled from the literature.

Some additional records of *Gammarus* species from different localities in Turkey are also reported in this study. They were also added to the checklist with their catalogue numbers. The samples were provided by different researchers and are deposited in the Museum of the Faculty of Fisheries, Ege University, İzmir, Turkey (ESFM).

Species list

To date, 38 *Gammarus* species have been reported from Turkey. These taxa are listed below in alphabetical order. The localities where they were found are also given.

Gammarus absciscus G. S. Karaman, 1973

Distribution: Kırşehir prov.: Kurugöl Lake near Mucur. Antalya prov.: Borabay Lake (KARAMAN & PINKSTER 1987).

Gammarus accolae G. S. Karaman, 1973

Distribution: Antalya prov.: Kırkgöz (KARAMAN & PINKSTER 1987).

Gammarus aequicauda (Martynov, 1931)

Distribution: Balıkesir prov.: Gönen; Muğla prov.: Milas and Köyceğiz Channel; Antalya prov.: Demre near Finike (KOCATAŞ & KATAĞAN 1978); İzmir prov.: Zeytinköy Fountain near Gümüldür, Balıklıova Creek near Urla-İçmeler and Ildır (ÖZBEK & USTAOĞLU 1998); İzmir prov.: Akgöl and Gebekirse lakes near Selçuk (USTAOĞLU et al. 2000); springs near İzmir (KARAMAN 2003); Muğla prov.: Bafa Lake (SARI et al. 2001, KARAMAN 2003); – New records: Muğla prov.: Dalaman, 18.vi.1998, leg.: M. ÖZBEK, Cat. No: ESFM-MALI 98/32; Bafa Lake; 19.iii.2007, leg.: H. SÖMEK, Cat. No: ESFM-MALI 07/10.

Gammarus agrarius G. S. Karaman, 1973

Distribution: Antalya prov.: Kırkgöz; Konya prov.: Ilgın; Afyon prov.: Karakuyu near Dinar; Niğde prov.: (no locality) (KARAMAN & PINKSTER 1977a); Adana prov.: Pozantı Stream (KARAMAN 2003); – New records: Adana prov.: Pozantı Stream, 4.vii.2007, leg.: G. DALGIÇ, Cat. No: ESFM-MALI 07/39.

Gammarus anatoliensis Schellenberg, 1937

Distribution: Akşehir prov.: Sultan Mountains; Eskişehir prov.: Bozüyük; Konya prov.: Dalayman near Çamlık, Körükün Cave and Ilgın; Isparta prov.: Şarkikaraağaç; Kütahya prov.: Tavşanlı; Ankara; Afyon; Eskişehir prov.: affluent of Porsuk River; Isparta prov.: affluent of Eğirdir Lake (KARAMAN & PINKSTER 1987); – New records: Çorum prov.: İskilip; 2.ix.2001, leg. E.T. TOPKARA, Cat. No: ESFM-MALI 01/05; Denizli prov.: Gümüşsu Waterfall near Çivril 01.ix.1998, leg.: M. ÖZBEK, Cat. No: ESFM-MALI 98/20; Adana prov.: Pozantı Stream, 04.vii.2007, leg. G. DALGIÇ, Cat. No: ESFM-MALI 07/40.

Gammarus arduus G. S. Karaman, 1975

Distribution: Tekirdağ prov.: Malkara; Edirne prov.: Kırçasalih (KARAMAN & PINKSTER 1977a); Istanbul prov.: Küçük Çekmece (KARAMAN 2003).

Gammarus argaeus Vavra, 1905

Distribution: Kayseri prov.: Soysalı; Kütahya prov.: Tavşanlı; Ankara prov.: Balışih; Burdur prov.: near Burdur Lake; Karaman; Niğde prov.: near Handere; Niğde prov.: Ulukışla; Aksaray prov.: river flowing into Tuz Lake; Aksaray prov.: Sultanhanı (KARAMAN & PINKSTER 1977b).

Gammarus balcanicus Schäferna, 1922

Distribution: Erciyes Mountain (S. KARAMAN 1934); Turkey (no locality) (KARAMAN & PINKSTER 1987). Kırşehir prov.: Kurugöl near Mucur; Çankırı prov.: Ilgaz village; Ankara prov.: Kırıkkale prov.: Çoruhönü Stream; Erzurum prov.: Palandöken; Bayburt prov.: Kopdağı Geçidi; Kastamonu prov.: Ballı Dağ (Daday); Kastamonu vicinity; Urganaz Geçidi, Ballı Dağ; Van prov.; Trabzon prov.: Maçka; Muğla prov.: Seki; River Kocaçay; Denizli prov.: Işıklı Lake; Sivas prov.: Yazyurdu village; Iznik, torrent towards the sea, 3 km from Istanbul; Burdur prov.: Çeltikçibeli; Eastern side of Erciyes Dağ; Niğde prov.: Ulukışla; Burdur prov.: Kurna Köyü (cave); Ordu prov.: Gürgentepe Geçidi; Çorum prov.: Mecitözü; Sinop prov.: Dranas Geçidi; Eastern part of Erciyes Dağ; Eskişehir prov.: Bozüyük; Acıgöl; Burdur Lake; Çankırı prov.: Yeniceköy (KARAMAN 2003); Lakes on Toros Mountains (Yeşil Lake, Küllük Lake and Sülüklü Lake-Bozkır) (USTAOĞLU et al., 2004); – New records: Hatay prov.: Harbiye Stream near Antakya; 03.ix.2001, leg.: M. ÖZBEK, Cat. No: ESFM-MALI 01/06; Konya prov.: Dedemli near Bozkır, 12.ix.2001, leg.: M. ÖZBEK, Cat. No: ESFM-MALI 01/21; Sivas prov.: Kızılırmak River near Zara, 02.vii.2007, leg.: G. DALGIÇ, Cat. No: ESFM-MALI 07/38.

Gammarus birsteini Karaman & Pinkster, 1977

Distribution: Artvin prov.: Yalnızçam Mountain Pass, Borçka and Hopa; Trabzon prov.: Zigana Mountain Pass; Bitlis prov.: Baykan (KARAMAN & PINKSTER 1977a); Rize prov.: Kalkandere (KARAMAN 2003); İzmir prov.: Dikili, Yelköprü (BALIK et al. 2002).

Gammarus crinicornis Stock, 1966

Distribution: İzmir, Akgöl and Gebekirse lakes near Selçuk (USTAOĞLU et al. 2000).

Gammarus dorsosetosus Mateus & Mateus, 1990

Distribution: Hatay (MATEUS & MATEUS 1990); Burdur prov.: Pınargözü; Karaman prov.: Lale Village (ÖZBEK & TOPKARA 2007).

Gammarus effultus G. S. Karaman, 1975

Distribution: Ankara prov.: Kalecik (KARAMAN & PINKSTER 1977a).

Gammarus fossarum Koch, 1835

Distribution: Northern part of Anatolia (KARAMAN & PINKSTER 1977a); torrent 2 km from Iznik (Istanbul Kapu); Istanbul prov.: Anadoluhisari; Artvin prov.: Hopa vicinity; Yeşilköy (location unclear due to the fact that there are many locations with the same name) (KARAMAN 2003).

Gammarus goedmakersae G. S. Karaman & Pinkster, 1977

Distribution: Kayseri prov.: Karpuzatan (KARAMAN & PINKSTER 1977b).

Gammarus inopinatus Mateus & Mateus, 1990

Distribution: Ankara prov.: Kulu (MATEUS & MATEUS 1990).

Gammarus insensibilis Stock, 1966

Distribution: İzmir prov.: Akgöl and Gebekirse lakes near Selçuk (USTAOĞLU et al. 2000).

Gammarus izmirensis Özbek, 2007

Distribution: İzmir prov.: Kemalpaşa (ÖZBEK 2007).

Gammarus kesanensis Özbek & Çamur-Elipek, 2010

Distribution: Edirne prov.: Keşan (ÖZBEK & ÇAMUR-ELİPEK 2010).

Gammarus kischineffensis Schellenberg, 1937

Distribution: Diyarbakır prov.: East of Silvan; Bitlis region, Risatliya; Erzurum vicinity; Aşkale, Erzurum (KARAMAN 2003); Erzurum prov.: Tortum; Elazığ; Gümüşhane prov.: Bayburt; Tunceli; Erzincan prov.: Akarsu village. – New records: Diyarbakır: university campus, 24.ix.1996, leg.: E. ÜNLÜ, Cat. No: ESFM-MALI 96/03; Diyarbakır prov.: tributary of Dicle (Tigris) River, leg.: Unknown, Cat. No: ESFM-MALI 07/18.

Gammarus komareki Schäferna, 1923

Distribution: Zonguldak prov.: Kapouz Cave (KARAMAN 2003); – New records: Trabzon prov.: (no locality); Sinop prov.: (no locality); Rize prov.: Zilkale; 23.viii.2005, leg.: M. ÖZBEK, Cat. No: ESFM-MALI 05/14.

Gammarus laborifer G. S. Karaman & Pinkster, 1977

Distribution: Isparta prov.: Eğirdir Lake (KARAMAN & PINKSTER 1977a; ÖZBEK & USTAOĞLU 2005); Burdur prov.: Çeltikçibeli (KARAMAN & PINKSTER 1977a); Burdur prov.: Burdur Lake (KARAMAN & PINKSTER 1977a); Isparta prov.: Kovada Lake and channel (ÖZBEK & USTAOĞLU 2005); Beyşehir Lake (ÖZBEK & USTAOĞLU 2005); – New records: Burdur prov.: Kocapınar; 30.viii.1998, leg.: S. SEVINÇ, Cat. No: ESFM-MALI 98/10.

Gammarus lacustris G. O. Sars, 1863

Distribution: İzmir prov.: Gölçük Lake (TAREEN 1974, ÖZBEK & USTAOĞLU 1998); Bolu prov.: Abant Lake; Artvin prov.: Yalnızçam Geçidi and Borçka; Ankara prov.: Eymir Lake; Van prov.: Söğütlü spring, spring Madir and Nemrut Dağı crater lake near Tatvan (KARAMAN 2003); Eber Lake (ÖZBEK & USTAOĞLU 2005); Beyşehir Lake (ÖZBEK & USTAOĞLU 2005); Isparta (ÖZBEK & USTAOĞLU 2005); – New records: Burdur prov.: Ağlasun; 03.vii.1998, leg. S. SEVINÇ, Cat. No: ESFM-MALI 98/06.

Gammarus longipedis G. S. Karaman & Pinkster, 1987

Distribution: Konya prov.: Su Çıktığı Cave near Hadim; Isparta prov.: Zindan Cave (KARAMAN & PINKSTER 1987). Lakes on Toros Mountains (Susam Lake, Karıncalı Lake) (USTAOĞLU et al. 2004).

Gammarus mladeni G. S. Karaman & Pinkster, 1977

Distribution: Konya prov.: Obruk and Sultanhanı; Aksaray prov.: Eşmekaya; Kırşehir; Hatay prov.: Arsuz (KARAMAN & PINKSTER 1977b).

Gammarus obnixus G. S. Karaman & Pinkster, 1977

Distribution: Afyon prov.: Acıgöl; Afyon prov.: Karakuyu and Düdenler; Denizli prov.: Çardak (beach of Acıgöl Lake); Isparta prov.: vicinity of Eğirdir and Beyşehir lakes (KARAMAN & PINKSTER 1977b).

Gammarus odettae Mateus & Mateus, 1990

Distribution: Ankara; Bursa prov.: İnkaya Cave; Çanakkale (MATEUS & MATEUS 1990).

Gammarus osellai G. S. Karaman & Pinkster, 1977

Distribution: Ankara prov. (no locality); Kırıkkale prov. (no locality); Kayseri prov.: Pınarbaşı (KARAMAN & PINKSTER 1977a).

Gammarus pageti Mateus & Mateus, 1990

Distribution: Erzurum (MATEUS & MATEUS 1990).

Gammarus pavo G. S. Karaman & Pinkster, 1977

Distribution: Burdur prov.: between Acıgöl and Burdur Lake; Afyon prov.: Karakuyu near Dinar (KARAMAN & PINKSTER 1977b); Lake Eğirdir; Afyon, Dinar (ÖZBEK & USTAOĞLU, 2005).

Gammarus pseudanatoliensis G. S. Karaman & Pinkster, 1987

Distribution: Sivas prov.: Gürün; Nevşehir prov.: Göre; Konya prov.: Meram; Antalya prov.: Fenike; Kahramanmaraş prov.: Elbistan; Ankara prov.: Gölbaşı (KARAMAN & PINKSTER 1987); Karaman prov.: Başharman; Kayseri prov.: Tomarza; Burdur prov.: Lake Yarışlı (ÖZBEK & USTAOĞLU, 2005); – New records: Kahramanmaraş prov.; 03.07.2007, leg.: G. DALGIÇ; Cat. No: ESFM-MALI 07/41.

Gammarus pseudosyriacus G. S. Karaman & Pinkster, 1977

Distribution: İzmir prov.: Selçuk; Muş prov.: Afsan R.; Artvin prov.: Kuraç; Bitlis prov.: Ahlat; Elazığ prov.: İçme; Elazığ prov.: Hazar Lake; Karaman prov.: Başharman; Niğde prov.: Bor; Afyon prov.: Karamık Marshes (KARAMAN & PINKSTER 1977a; ÖZBEK & USTAOĞLU 2005); – New records: Elazığ prov.: Kırkgöze; 11.iv.1986, leg.: Unknown, No: ESFM-MALI 86/04.

Gammarus pulex pulex (Linnaeus, 1758)

Distribution: Yalova prov.: Armutlu; Iznik Lake; Iznik, brook near Yenişehir Kapı at Lake; warm spring between Akhisar and Marmara; Trabzon prov.; Konya prov.: Hadim (Su Çıktığı Cave); Edirne prov.: Küçükuyu; Manisa prov.: Bozdağ; Eskişehir prov.: Bozüyük (KARAMAN 2003); Afyon prov.: Karamık Marshes; Lake Eber; Lake Beyşehir; Isparta prov.: Eğirdir, Aksu and Akdoğan (ÖZBEK & USTAOĞLU 2005); – New records: Çanakkale prov.: Ayazma Stream, 13.vi.2000, leg.: M. ÖZBEK, Cat. No: ESFM-MALI 00/27; Balıkesir prov.: Sütüven Stream, 01.vii.2001, leg.: M. Özbek; Cat. No: ESFM-MALI 01/02.

Gammarus roeseli Gervais, 1835

Distribution: Lake Eğirdir (ÖZBEK & USTAOĞLU 2005).

Gammarus subtypicus Stock, 1966

Distribution: Çanakkale prov.: Lapseki; Balıkesir prov.: Erdek; İzmir prov.: Aliağa (KOCATAŞ & KATAĞAN 1978); İstanbul prov.: Florya; Adana prov.: Akyatan Lagoon (BELLAN-SANTINI et al. 1982). İzmir prov.: Gebekirse Lake near Selçuk (KOCATAŞ & KATAĞAN 1978, USTAOĞLU et al. 2000); Muğla prov.: Bafa Lake (SARI et al. 2001).

Gammarus topkarai Özbek & Balık, 2009

Distribution: Konya prov.: Ivriz Creek (ÖZBEK & BALIK 2009).

Gammarus uludagi G. Karaman 1975

Distribution: Bursa prov.: Uludağ Mountain; Aydın prov.: Gölcük; İzmir (KARAMAN & PINKSTER 1977a); Manisa prov.: Gürle; İzmir prov.: Kemalpaşa (ÖZBEK & USTAOĞLU 1998).

Gammarus ustaoglui Özbek & Güloğlu, 2005

Distribution: Anamur prov.: Peynirliközü Cave at Taşeli Plateau (ÖZBEK & GÜLOĞLU 2005).

Gammarus vignai Pinkster & Karaman, 1977

Distribution: Konya prov.: “Çamlık-Dalayman Çocuk Attıkları Delik” Cave (KARAMAN & PINKSTER 1977a).

Acknowledgements. I wish to thank Dr E. T. TOPKARA and Dr L. DALGIÇ for providing some amphipod samples.

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