

CONTRIBUTIONS TO DISTRIBUTION OF TURKISH FRESHWATER ISOPODS (CRUSTACEA: ISOPODA)

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ABSTRACT

This study was carried out to contribute to distribution of freshwater isopods in Marmara Region (including Gökçeada and Bozcaada islands) of Turkey. For this aim, it was evaluated the material which was sampled during the years 1991, and 1998-2002 in a total of 37 localities from different water resources in the region. End of the study, it was observed that *Asellus aquaticus* (L.) Racovitza, 1919 is a very common species in the area. Furthermore, subspecies and intersex forms belonging *Asellus aquaticus* were recorded in some localities.

Keywords: Isopoda, *Asellus aquaticus*, subspecies, intersex, Turkish Thrace.

TÜRKİYE TATLISU ISOPODLARININ (CRUSTACEA: ISOPODA) DAĞILIMINA KATKILAR

ÖZET

Bu çalışma, Türkiye'nin Marmara bölgesindeki (Gökçeada ve Bozcaada dahil) tatlısu isopodlarının dağılımına katkıda bulunmak amacıyla gerçekleştirildi. Bu amaç doğrultusunda, 1991 yılı ve 1998-2002 yılları arasında toplam 37 lokalitedeki farklı su kaynaklarından örneklenen materyal değerlendirildi. Çalışmanın sonunda, *Asellus aquaticus* (L.) Racovitza,

1919'un bölgede oldukça yaygın bir tür olduğu gözlemlendi. Araştırmada ayrıca, bazı lokalitelerden *Asellus aquaticus*'a ait alttür ve interseks formlar da kaydedildi.

Anahtar kelimeler: Isopoda, *Asellus aquaticus*, alttür, interseks, Trakya.

INTRODUCTION

Asellidae Rafinesque, 1815 (Isopoda: Asellota) is one of the largest family of freshwater isopods, living in both epigeal and hypogean habitats of the water resources. A total of 21 genus are belong to Asellidae family.

A total of three species (*A. aquaticus*, *A. monticola*, and *A. hilgendorfi*) belonging to *Asellus* genus were recorded from Turkish inland waters (Çamur and Kırğız, 2000; Özbek and Ustaoglu, 2006). *Asellus aquaticus* is common throughout the temperate zone including Europe, Russia, and North America occurring as far South as the Mediterranean and as far North as Scandinavia (Maltby, 1991). Most of the range is inhabited by morphologically uniform populations of the nominotypic subspecies *Asellus aquaticus aquaticus* (Verovnik et al, 2005). Up to now, it has been reported the species *Asellus aquaticus* has a total of eleven subspecies: *A.a. aquaticus*, *A.a. irregularis*, *A.a. cyclobranchialis*, *A.a. carniolicus*, *A.a. cavernicolus*, *A.a. carsicus*, *A.a. longicornis*, *A.a. balcanicus*, *A.a. fribergensis*, *A.a. abyssalis*, *A.a. messerianus* (Sket, 1965). But, there is no record in Turkish Thrace on subspecies of the species.

Although freshwater isopod fauna of Turkish Thrace were determined in the previous study, there is no record from Çanakkale vicinity of Thrace region (Çamur and Kırğız, 2000). Especially there is no any record on freshwater isopod fauna of Gökçeada and Bozcaada islands in Çanakkale vicinity. Also, in this study, the localities in Turkish Thrace where did not searched for freshwater isopods before, were investigated.

MATERIAL AND METHODS

Material was collected from some localities in Marmara Region of Turkey (including Gökçeada and Bozcaada islands). Sampling was made in a total of 37 localities (in Çanakkale, İstanbul, and Kırklareli) from lakes, ponds, marshes, springs and troughs by using hand grab during the years 1991, and 1998-2002 (Figure 1). The descriptions of Birstein (1951), Gruner Trakya Univ J Nat Sci, 13(2), 95-100, 2012

(1965), Sket (1965), Gledhill et al. (1976), and Argano (1979) were followed in order to identify the species.

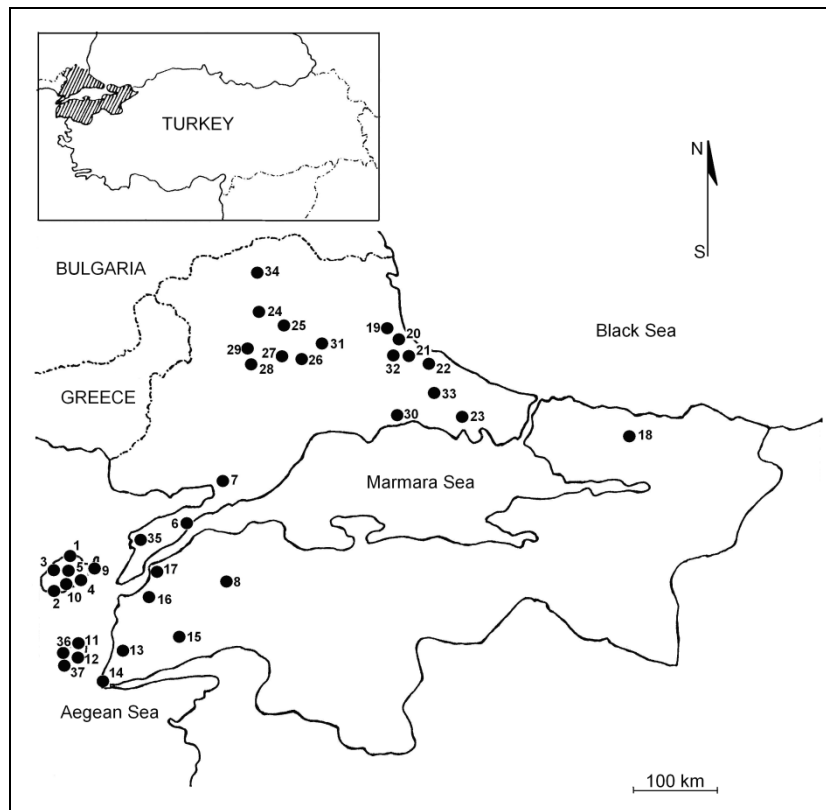


Figure 1. The sampling localities in the Turkish Thrace region

RESULTS

Only one species, *Asellus aquaticus* belonging to Asellidae family, has been determined in all sampled localities except locality numbers 6 and 9 (Table 1). A total of 286 males and 164 females were identified in the area. Furthermore, subspecies forms (a total of 11 males, 15 females) which are separated from the typical species with their some characteristics were identified at two different localities. Also, some intersex forms belonging *Asellus aquaticus* were determined from the area. These are listed below:

Genus: *Asellus* G.St. Hilaire, 1764

- Species: *Asellus aquaticus* (L.) Racovitza, 1919: In all sampled localities (except the sampled localities number 6 and number 9 at Table 1/ Figure 1).
- Subspecies: *Asellus aquaticus* ssp.: In localities number 6 and number 9 at Table 1/ Figure 1.
- Intersex forms of *Asellus aquaticus*: In localities number 17 and number 19 at Table 1 / Figure1.

Table 1. Localities, sampling dates, and determined species with their habitat types in the investigated area (P: Province; Ç: Çanakkale; I: İstanbul; K: Kırklareli).

Locality	P	Sampling date	Habitat	Species
1 Y.Bademli Village/Gökçeada	Ç	10.07.1991	stream	<i>A.aquaticus</i> (5♂♂, 2♀♀)
2 Uğurlu Village/Gökçeada	Ç	12.07.1991	stream	<i>A.aquaticus</i> (6♂♂, 11♀♀)
3 Esenyurt Village/Gökçeada	Ç	19.07.1991	trough	<i>A.aquaticus</i> (25♂♂, 10♀♀)
4 Kapıkaya locality/Gökçeada	Ç	23.07.1991	trough	<i>A.aquaticus</i> (6♂♂, 1♀♀)
5 Dereköy Ayazma/Gökçeada	Ç	25.07.1991	trough	<i>A.aquaticus</i> (1♂, 1♀)
6 Gelibolu bridge/Gelibolu	Ç	12.04.1998	stream	<i>A.aquaticus</i> ssp. (1♂)
7 Evreşe Village/Gelibolu	Ç	12.04.1998	stream	<i>A.aquaticus</i> (3♂♂, 4♀♀)
8 Kocayayla Village/Çan	Ç	12.04.1998	stream	<i>A.aquaticus</i> (38♂♂, 14♀♀)
9 Aydıncık pond/Gökçeada	Ç	06.08.1999	trough	<i>A.aquaticus</i> ssp. (10♂♂, 15♀♀)
10 Çınarlı brook/Gökçeada	Ç	10.08.1999	stream	<i>A.aquaticus</i> (1♂, 1♀)
11 Aral Farm locality/Bozcaada	Ç	14.08.1999	trough	<i>A.aquaticus</i> (26♂♂, 15♀♀)
12 Ayazma, Çınaraltı/Bozcaada	Ç	14.08.1999	trough	<i>A.aquaticus</i> (31♂♂, 22♀♀)
13 Kösedere brook/Ayvacık	Ç	15.08.1999	stream	<i>A.aquaticus</i> (35♂♂, 18♀♀)
14 Babakale locality/Ayvacık	Ç	16.08.1999	trough	<i>A.aquaticus</i> (1♂, 2♀♀)
15 Bayramiç-Ezine between	Ç	17.08.1999	trough	<i>A.aquaticus</i> (13♂♂, 6♀♀)
16 Dümrek brook/İntepe	Ç	18.08.1999	stream	<i>A.aquaticus</i> (4♂♂, 2♀♀)
17 Yalova brook	Ç	02.09.2000	stream	<i>A.aquaticus</i> (16♂♂, 10♀♀) <i>A.aquaticus</i> (2 intersex)
18 Yalıköy-Karacaköy between /Şile	I	05.09.2000	stream	<i>A.aquaticus</i> (1♂)
19 Istranca stream OrmanlıVillage /Çatalca	I	05.09.2000	stream	<i>A.aquaticus</i> (3♂♂, 1♀) <i>A.aquaticus</i> (1 intersex)
20 Büyükdere stream/Çilingoz	I	06.09.2000	stream	<i>A.aquaticus</i> (2♂♂, 2♀♀)
21 Terkos Lake, Ormanlı/Çatalca	I	06.09.2000	lake	<i>A.aquaticus</i> (2♂♂, 1♀)
22 Terkos Lake/Çatalca	I	06.09.2000	lake	<i>A.aquaticus</i> (2♂♂, 2♀♀)
23 Karasu brook/Çatalca	I	07.09.2000	stream	<i>A.aquaticus</i> (1♂, 1♀)
24 İnece bridge/İnece	K	14.10.2000	stream	<i>A.aquaticus</i> (1♂)
25 Değirmencik Village	K	14.10.2000	stream	<i>A.aquaticus</i> (2♂♂, 2♀♀)
26 Dügüncübaşı-Oklalı between/L.burgaz	K	14.10.2000	stream	<i>A.aquaticus</i> (2♀♀)
27 Ergene stream, Sinanlı Village	K	14.10.2000	stream	<i>A.aquaticus</i> (5♂♂, 2♀♀)
28 Hıdırca brook/Babaeski	K	15.10.2000	stream	<i>A.aquaticus</i> (1♂, 2♀♀)
29 Ağayeri Village/Babaeski	K	15.10.2000	stream	<i>A.aquaticus</i> (3♂♂, 1♀♀)
30 Kınalı brook, Çanta köy/Silivri	I	16.10.2000	stream	<i>A.aquaticus</i> (1♂)
31 Sakızköy brook/Lüleburgaz	K	17.10.2000	stream	<i>A.aquaticus</i> (1♂)
32 Terkos Lake, Celepköy/Çatalca	I	04.07.2001	lake	<i>A.aquaticus</i> (1♂, 1♀)
33 Ovayenice Village/Çatalca	I	04.07.2001	stream	<i>A.aquaticus</i> (10♂♂, 9♀♀)
34 Teke brook/Çayırılı, Kofçaz	K	19.08.2001	stream	<i>A.aquaticus</i> (2♂♂, 1♀)
35 Ecelimanı brook, Beşyol Village/Eceabat	Ç	24.08.2001	stream	<i>A.aquaticus</i> (9♂♂, 1♀)
36 Mağaralı fountain/Bozcaada	Ç	24.05.2002	trough	<i>A.aquaticus</i> (4♂♂, 3♀♀)
37 Aral Farm locality/Bozcaada	Ç	24.05.2002	stream	<i>A.aquaticus</i> (24♂♂, 14♀♀)

DISCUSSION

It was found that the species *Asellus aquaticus* is very common in the sampled localities. It is known that this species is a very common specimen in Europea because of it is a cosmopolite species. The reason of this wide distribution of the species is based on the fact that the characteristics of those species are invariable and they are not affected by geographical variations and they are tolerant to lower concentrations of oxygen, saltiness and considerable irregular changes in the temperature of water resources (Birstein, 1951). Therefore, it is usual to find *Asellus aquaticus* specimens in a lot of area in the studied localities.

Although it has been reported that the species *Asellus aquaticus* has a total of eleven subspecies (*aquaticus*, *irregularis*, *cyclobranchialis*, *carniolicus*, *cavernicolus*, *carsicus*, *longicornis*, *balcanicus*, *fribergensis*, *abyssalis*, *messerianus*), there is no record in Turkish Thrace on its subspecies. In the present study, it was found that the subspecies *A.aquaticus* ssp. from two different localities in the studied area. These findings should be described after a careful review of the various specimens from abroad.

In previous, intersex forms belonging *Asellus aquaticus* were discussed in Turkish isopod fauna by Çamur-Elipek and Kırgız (2004). These forms are distinguished by their some special characters from the type specimens. It was also found the intersex forms in two different sampling localities in the present study (Table 1).

Furthermore, there is no any record on freshwater isopods from Gökçeada and Bozcaada islands. Consequently, because of there is no study on aquatic isopod fauna of Çanakkale and the islands (Gökçeada and Bozcaada), all asellid findings are the first records for the region.

REFERENCES

- [1] ARGANO R. Guide Per Il Riconoscimento Delle Specie Animali Delle Acque Interne Italiane Isopodi (Crustacea Isopoda). 64 S. Istituto di Zoologia dell'Universita di Roma, Consiglio Nazionale Delle Ricerche, Roma, 1979.
- [2] BIRSTEIN A. Fauna of U.S.S.R.: Crustacea, Freshwater Isopods (Asellota), Vol. VII, No. 5, 148 S. Oldbourne Press, London, 1951.
- [3] ÇAMUR B, KIRGIZ T. Freshwater Isopod (Crustacea) Species in Turkish Thrace and Their Distribution, *Turkish Journal of Zoology*, 24: 17-22, 2000.

- [4] ÇAMUR-ELİPEK B, KIRGIZ T. A Preliminary Study on the Intersexes of *Asellus aquaticus* (Isopoda: Crustacea), *Acta Zoologica Bulgarica*, 56(1):105-108, 2004.
- [5] GLEDHILL T, SUTCLIFFE DW, WILLIAMS WD. Key to British Freshwater Crustacea: Malacostraca. Freshwater Biological Association, Scientific Publication No.32. 72 S. The Librarian, The Ferry House, Ambleside, Cumbria LA, 1976.
- [6] GRUNER HE. Die Tierwelt Deutschlands und der angrenzenden Meeresteile nach ihrer Lebensweise, 51. Teil, Krebstiere oder Crustacea V. Isopoda, 1. Lieferung, Veb Gustav Fischer Verlag Jena, 149 S. Berlin, 1965.
- [7] MALTBY L. Pollution as a Probe of Life-History Adaptation in "*Asellus aquaticus*" (Isopoda). *Oikos*, 61(1): 11-18, 1991.
- [8] ÖZBEK M, USTAOĞLU MR. Check-list of Malacostraca (Crustacea) Species of Turkish Inland Waters, *Ege University Journal of Fisheries & Aquatic Sciences* 23 (1-2): 229–234, 2006.
- [9] SKET B. Taksonomska problematika vrste *Asellus aquaticus* (L.) Rac. (Crust., Isopoda), s posebnim ozirom na populacije v Sloveniji (Taxonomische Problematik der Art *Asellus aquaticus* (L.) Rac. mit besonderer Rücksicht auf die Populationen Sloweniens).. *Razprave SAZU*, cl. IV. 8:177-221. 1965.
- [10] VEROVNIK R, SKET B, TRONTELJ P. The colonization of Europe by the freshwater crustacean *Asellus aquaticus* (Crustacea: Isopoda) proceeded from ancient refugia and was directed by habitat connectivity, *Molecular Ecology* 14:4355–4369. 2005.