Two New Records For The Brackish water Oligochaeta (Annelida: Naididae: Tubificinae) From The Aegean Coastal Ecosystem (Turkey)

Seray Yıldız1,*, M. Ruşen Ustaoğlu1

1 Ege University, Faculty of Fisheries, Department of Hydrobiology, 35100 Bornova-İzmir-TURKEY.

Abstract

The benthic assemblages of The Lagoon Karina (Söke, Aydın, TURKEY) have been determined seasonally between May 2011 and April 2012. Totally 9 stations, which consist of 8 stations within the lagoon, and a limnocrene brackish waters spring flowing into the lagoon were sampled. As a result of the samplings, Tubificoides benedii (d’Udekem, 1855) and Clitellio arenarius (Müller, 1776) were reported as new marine Oligochaeta records for the Turkish fauna. Their morphological features were examined under a light microscope and pictures of them were given.

Keywords: Oligochaeta, new record, Aegean Sea, Karina Lagoon, Turkey.

Introduction

Oligochaetes, a subclass of the class Clitellata, of the phylum Annelida, have a worldwide distribution and about 1700 valid species of aquatic oligochaetes are known to date; of these, Erseus (2005) said that the most specious aquatic family is Tubificidae, with about 800 described species worldwide, a majority of which are marine (Martin et al., 2008).

The family Tubificidae is the only family with a cosmopolitan distribution and is well represented in the sea and coastal systems (Erseus, 1980). Some tubificids are restricted to brackish water, but the majority of species are indeed marine, some species occurring at bathyal or even abyssal depths (Erseus and Healy, 2001).

Both of the Tubificoides and Clitellio are genera within the kingdom Animalia, subfamily Tubificinae. At least 56 species of Tubificoides and 4 species and subspecies of Clitellio have been described (WoRMS Editorial Board, 2016).

Up to now, no any records belong these species have been reported in Turkey (Arslan, 2006; Çınar et al., 2011; Çınar et al., 2014).

The objective of the present study to report Tubificoides benedii (d’Udekem, 1855) and Clitellio arenarius (Müller, 1776) türleri Türkiye denizel Oligoket faunası için yeni kayıt olarak rapor edilmiştir. Bu türlerin morfolojik özellikleri ışık mikroskobunda incelenmiş ve fotoğrafları verilmiştir.
Oligochaeta fauna. As a result of the samplings, *Tubificoides benedii* (d’Udekem, 1855) and *Clitellio arenarius* (Müller, 1776) were reported from only limnocrene brackish waters spring flowing into the lagoon. Samples were fixed on-site with 4% formaldehyde/seawater solution. Fixed material was again sieved with a 500-µm sieve in laboratory. After sorting the material, oligochaete specimens were preserved in 70% ethyl alcohol and prepared for identification as permanent mounts using CMCP 10 (Polyvinil Lactophenol) solution. The keys by Brinkhurst (1982) and by Timm (1999) were used for species identification. The photographs of the species were taken by a digital camera (Olympus, Camedia, C-7070) attached to stereo and compound microscopes. The specimens are deposited in the Museum of the Faculty of Fisheries, Ege University (ESFM) as a whole permanent mouth.

**Results**

Morphometric, biological and ecological characteristics and the distribution of Oligochaeta species specified as new records for the marine (brackish water) fauna of Turkey are as follows.

*Tubificoides benedii* (d’Udekem, 1855) (Figure 1, 2, 3)

**Material:** 3 specimens. Specimens were found only limnocrene brackish waters spring flowing into the lagoon in the study area.

**Measurements:** Total length = 20-87.5 mm
Number of segments = 37-52

**Description:** Whole body densely papillate. In all bundles, crotchets with smaller upper tooth or with simple sharp tip, about 80-112 µm, in anterior bundles by 2-3, in posterior bundles by 1-2.

**Differential characteristics:** Similar to *Tubificoides heterochaetus* (Michaelsen, 1926), but *T. heterochaetus* has tiny and sparse papillae on the whole body in young specimens but on tail only in adults. It has 2-5 crotchets in anterior bundles, about 50 µm. Length is 7-9 mm, and also it was found weakly brackish bays and river mouths. Similar to *Tubificoides pseudogaster* (Dahl, 1960), but this species has more setae per bundle (up to six) but they are clearly bifid.

**Environment:** Marine, Brackish water

**Habitat:** In brackish water, Hard substratum, with stony-sandy areas and coastal vegetation (in the present study).

**Distribution:** Baltic Sea (Polish Exclusive Economic Zone), Buy of Fundy (Cobscook Bay), France (Wimereux), Ireland (Irish Exclusive Economic Zone), North Atlantic Ocean (European Waters, Gulf of Maine, North East Atlantic, North West Atlantic), North Sea (Belgian Exclusive Economic Zone) (Timm and Erséus, 2015a).

*Clitellio arenarius* (Müller, 1776) (Figure 4, 5)

**Material:** 45 specimens. Specimens were found only limnocrene brackish waters spring flowing into the lagoon in the study area.

**Measurements:** Total length = 20-75 mm
Number of segments = 60-205

**Description:** Anterior setae 2-5 per bundle, 90-140 µm, and simple or with very fine upper tooth. In mature worms, there is ventral seta in X single, in XI lacking.

**Environment:** Marine, Brackish water

**Habitat:** Hard substratum, with stony-sandy areas and coastal vegetation (in present study)
Distribution: Baltic Sea (Polish Exclusive Economic Zone), Buy of Fundy (Cobscook Buy), France (Wimereux), North Atlantic Ocean (European Waters, Gulf of Maine, North East Atlantic, North West Atlantic) (Timm and Erséus, 2015b).

Discussion

Knowledge about the marine oligochaete fauna of Turkey is limited at present. Although freshwater oligochaetes have been studied in different regions of Turkey, only a few studies are available on the marine representatives of the group; Demir (1952) reported Enchytraeoides marioni Roule, 1889 and Kalkan et al., (2007) reported Enchytraeus buchholzi Vejdovský, 1879 from Sea of Marmara. Matamoros et al., (2007) described a new marine oligochaeta species Marionina triplex Matamoros, Yıldız & Erséus, 2007 from The Black Sea. Balık et al., (2004) reported on species of Oligochaeta and Aphanoneura from the Gediz Delta (Izmir, Turkey), namely Lumbricillus lineatus (Müller, 1774), Lumbricillus tuba Stephenson, 1911, Limnodriloides pierantonii

Figure 2: Densely papillate whole body of Tubificoides benedii (d’Udekem, 1855).

Figure 3: Anterior dorsal setae with smaller upper tooth of Tubificoides benedii (d’Udekem, 1855).

Figure 4: Whole body of Clitellio arenarius (Müller, 1776).
(Hrabé, 1971), Paranaïs frici Hrabe, 1941, Paranaïs litoralis (Müller, 1780), Vjevodskylia comata (Vjevodsky, 1884), and Tubificoides euxinus (Hrabé, 1966). Çınar et al. (2006) investigated the temporal changes in soft-bottom zoobenthic communities in and around Alsancak Harbour (Izmir Bay, Aegean Sea) and only two marine oligochaete species were noted in that study: Tubificoides swirencowi Jaroschenko, 1948 and Thalassodrilides gurwitschi (Hrabé, 1971). Çınar et al. (2011) also reported Limnodriloides pierantonii (Hrabé, 1971) and Tubificoides vestibulatus Ersëus & Bonomi, 1987 in addition to these two species from Sea of Marmara. Also, Kiseleva (1969) reported Tubificoides swirencowi Jaroschenko, 1948 and Băcescu et al. (1971) reported Tubificoides euxinus (Hrabé, 1966) from The Black Sea. Oligochaete studies in lagoons are based on recent past in Turkey. A pioneering study by Yıldız et al. (2007) was conducted. In this study, benthic samples collected from some lagoons in 1995 and 1996 with the scope of management and development strategies and improvement project of lagoons in Turkey coasts. Although 9 Oligochaeta species were determined, however only three of them namely Heterochaeta costata Claparedé, 1863, Potamothrix heuscheri (Bretschner, 1900), and Potamothrix bavaricus (Öschma, 1913) have characteristics of brackish water or marine. Regarding these studies, three species belong to genus Tubificoides have been reported in Turkey and no any species belongs to genus Clitellio. Baker (1984) reported The NE Atlantic fauna usually has a relatively low diversity with broad species ranges, and is dominated by Tubificoides benedeni and Clitellio arenarius. Our findings are compatible with those comments.

Apart from new information on the species, the present records also contribute to the knowledge on the distribution of these species by extending the distribution area to the Turkish part of Asia.

Acknowledgments

This research has been supported by Ege University Investigation Fund (2010/SÜF/018). We are deeply grateful to them for their financial support. Authors also would like to thank Prof. Dr. Murat ÖZBEK for arranging the figures and to Dr. Ayşe TAŞDEMİR, Dr. Esat T. TOPKARA and Mesut Kaptan for their support and help on technical issues in the field.

References

Demir, M. 1952. Boğazlar ve adalar sahillerinin omurgassz

Figure 5: Anterior dorsal setae with very fine upper tooth of Clitellio arenarius (Müller, 1776).


