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Research Article

Meiobenthic Ectinosomatids (Crustacea: Copepoda: Harpacticoida) of the Mediterranean Sea Coasts of Turkey

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Abstract: Ectinosomatid species inhabiting in interstitial habitats of Mediterranean Sea coast of Turkey were investigated. Samples were collected from a total of 89 localities from the beaches between Samandağ (Hatay) and Eşen River (Antalya). Nine ectinosomatid species (*Ectinosoma soyeri*, *E. melaniceps*, *E. reductum*, *Halectinosoma herdmani*, *Microsetella norvegica*, *M. rosea*, *Hastigerella bodini*, *H. bozici*, *Arenosetella germanica*) which belong to five genera were identified. Four species; *Ectinosoma reductum*, *Halectinosoma herdmani*, *Microsatella rosea and Hastigerella bozici* are recorded for the first time from Turkish marine waters

Keywords: Mediterranean Sea, New record, Ectinosomatidae, Meiofauna, Taxonomy

Türkiye'nin Akdeniz Sahili Mayobentik Ectinosomatidleri (Crustacea: Copepoda: Harpacticoida)

Özet: Türkiye'nin Akdeniz sahili boyunca kumiçi yasayan ectinosomatid türleri tespit edildi. Bu amaçla Türkiye'nin Akdeniz sahil seridinde Hatay'ın Samandağ ilçesi ile Antalya'nın Esen çayı arasında kalan kumsallardan toplam 89 lokaliteden örnek alındı. 5 cinse dahil 9 ectinosomatid türü belirlendi. Bu türler: *Ectinosoma soyeri, E. reductum, E. melaniceps, Halectinosoma herdmani, Microsetella norvegica, M. rosea, Hastigerella bodini, H. bozici* ve *Arenosetella germanica*'dır. Belirlenen bütün türler Türkiye'nin Akdeniz sahili için yeni kayıttır. Bunun yanında toplam türlerin 4 tanesi (*Ectinosoma reductum, Halectinosoma herdmani, Microsetella rosea, Hastigerella bozici*) Türkiye sahilleri için yeni kayıttır.

Anahtar kelimeler: Akdeniz, Yeni Kayıt, Ectinosomatidae, Mayofauna, Taksonomi.

Introduction

Family Ectinosomatidae of order Harpacticoida consists of 234 species/subspecies which are classified into 21 valid genera (Wells 2007; Kihara & Huys, 2009). The family was established by Sars, 1903 as Ectinosomidae which takes its stem from genus *Ectinosoma* Boeck, 1865, afterwards emended by Moore in 1978 as Ectinosomatidae according to the International Code of Zoological Nomenclature (Moore, 1978). Members of the family generally inhabit marine habitats except the genus *Pseudectinosoma* Kunz, 1935 those members are found predominantly in freshwater. Although they are usually high in biodiversity and abundance especially in interstitial meiofauna (Karanovic & Pesce, 2001; Seifried et al., 2007), only 9 species belonging to 4 genera have been recorded from interstitial habitats of Aegean Sea and Sea of Marmara. Noodt (1955) was the first who discovered *Ectinosoma melaniceps* Boeck, 1865*, E. normani* T. & A. Scott, 1894 and *E. dentatum* Steuer, 1940 from the Sea of Marmara. Then Karaytuğ and Sak (2008) recorded *Ectinosoma melaniceps* Boeck 1865, *Arenosetella germanica* Kunz, 1937 and *Hastigerella psammae* (Noodt, 1955) from Balıkesir coasts. Finally *Ectinosoma soyeri* Apostolov, 1975, *Microsetella norvegica* (Boeck, 1865), *Arenosetella tenuissima* (Klie, 1929), *Arenosetella germanica* Kunz, 1937 and *Hastigerella bodini* Apostolov, 1974 were reported from coasts of Datça-Bozburun Peninsula (Alper et al., 2010). However there is no record of ectinosomatids from Mediterranean coasts of Turkey so far. Therefore the species that are mentioned in this paper are the first ectinosomatids that are recorded from the Turkish Mediterranean coasts as well as 4 of them are new for Turkish Marine waters.

Material and Methods

Samples were collected from a total of 89 localities from the beaches between Samandağ (Hatay) and Eşen River (Antalya) (Figure 1 and Table 1) by using Karaman-Chauppuis method (Delamare Deboutteville, 1954). Ectinosomatids were extracted from detritus by hand using a Pasteur pipette under Olympus SZX-12 stereo microscope. Observations were made from whole or dissected individuals. The whole individuals and/or dissected parts were mounted on slides in lactophenol mounting medium. Broken coverslip pieces were placed between slide and coverslip in order to avoid the specimen to be compressed and enable the rotation and manipulation. Identification of the species were made under DIC (Differential interference contrast) attached Olympus BX-51 binocular microscope with the help of Wells (2007) and related literatures.

The descriptive terminology adopted from Huys et al (1996) except for the swimming leg formula which fallows Lang (1948). Abbreviations used in the text and figures are: P1-P4, 1st to 4th swimming legs; P5, leg 5, exp, exopod and enp, endopod.

All the materials that are used in this study are deposited in the BUZM (Balıkesir University Zoology Museum).

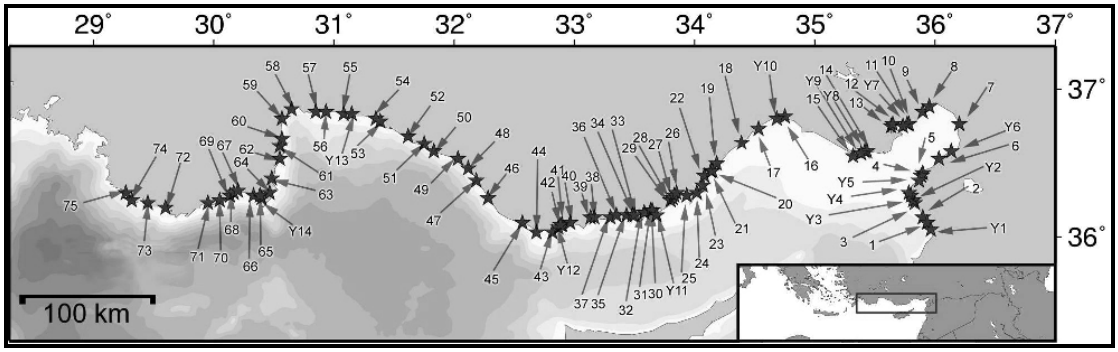

Figure 1. Map of the sampling localities.

Table 1: Sampling localities

St.	Sampling Dates				Localities	Coordinates
	1.	2.	3.	4.		
1	07.04.07	25.07.07	24.11.07		Samandağ beach, Mağaracık / Hatay	N 36° 05.783'; E 35° 56.182'
2	07.04.07	25.07.07	24.11.07		North of Mağaracık / Hatay	N 36° 08.315'; E 35° 54.598'
3	07.04.07	25.07.07	24.11.07		Between Arsuz & Mağaracık / Hatay	N 36° 14.008'; E 35° 50.220'
4	07.04.07	25.07.07	24.11.07		Arsuz beach / Hatay	N 36° 24.808'; E 35° 53.202'
5	07.04.07	25.07.07	24.11.07		Gözcüler beach / Hatay	N 36° 25.656'; E 35° 54.033'
6	07.04.07	-	-		Between Arsuz & Payas/ Hatay	N 36° 32.089'; E 36° 02.485'
7	07.04.07	24.07.07	24.11.07		Payas beach / Hatay	N 36° 45.604'; E 36° 11.834'
8	08.04.07	24.07.07	25.11.07	13.09.08	Kurtpınar beach / Hatay	N 36° 53.409'; E 35° 56.775'
9	08.04.07	24.07.07	25.11.07		Gölovası beach / Adana	N 36° 51.329'; E 35° 54.389'
10	08.04.07	24.07.07	25.11.07	13.09.08	East beach of Yumurtalık /Adana	N 36° 45.180'; E 35° 47.515'
11	08.04.07	24.07.07	25.11.07		West beach of Yumurtalık /Adana	N 36° 46.133'; E 35° 46.553'

12	08.04.07	24.07.07	25.11.07	13.09.08	Haylazlı village, Sarıgöl/ Adana	N 36° 45.684'; E 35° 39.444'
13	08.04.07	24.07.07	25.11.07	13.09.08	Deveciuşağı village / Adana	N 36° 44.809'; E 35° 37.699'
14	08.04.07	-	-		Asu beach, Karataş / Adana	N 36° 35.448'; E 35° 25.450'
15	08.04.07	24.07.07	25.11.07		Harbiş beach, Karataş / Adana	N 36° 33.937'; E 35° 19.600'
16	09.04.07	26.07.07	26.11.07		Kazanlı beach / Mersin	N 36° 48.617'; E 34° 45.442'
17	09.04.07	26.07.07	26.11.07		Viranşehir beach / Mersin	N 36° 44.357'; E 34° 32.478'
18	09.04.07	26.07.07	-		Alata beach / Mersin	N 36º 37 766'; E 34º 20 917'
19	09.04.07	26.07.07	26.11.07		Yemişkumu beach / Mersin	N 36° 30.009'; E 34° 11.322'
20	09.04.07	27.07.07	26.11.07		Kızkalesi beach / Mersin	N 36° 27.473'; E 34° 08.647'
21	10.04.07	27.07.07	26.11.07		Akkum beach / Mersin	N 36° 27.570'; E 34° 07.984'
22	10.04.07	27.07.07	27.11.07		Susanoğlu (Atakent) beach / Mersin	N 36° 25.006'; E 34° 05.074'
23	10.04.07	27.07.07	27.11.07	14.09.08	Arkum beach / Mersin	N 36° 21.519'; E 34° 04.762'
24	10.04.07	-	-		Akgöl beach /Mersin	N 36° 18.005'; E 34° 01.177'
25	10.04.07	27.07.07	27.11.07	14.09.08	East of Kum district, Taşucu/Mersin	N 36° 17.829'; E 33° 50.863'
26	10.04.07	27.07.07	27.11.07	14.09.08	Akçakıl camping area-Taşucu/Mersin	N 36° 17.829'; E 33° 50.863'
27	10.04.07	27.07.07	27.11.07		Nato harbor /Mersin	N 36° 17.094'; E 33° 49.928'
28	10.04.07	27.07.07	27.11.07		Boğsak beach / Mersin	N 36° 16.264'; E 33° 48.842'
29	10.04.07	27.07.07	27.11.07		Vadi/Mersin	N 36° 15.129'; E 33° 48.489'
30	11.04.07	28.07.07	27.11.07	14.09.08	Yeşilovacık village/Mersin	N 36° 11.453'; E 33° 39.363'
31	11.04.07	28.07.07	28.11.07	-	West of Yeşilovacık/Mersin	N 36° 11.297'; E 33° 37.723'
32	11.04.07	28.07.07	28.11.07	14.09.08	Büyükeceli beach (Ovacık)/Mersin	N 36° 09.516'; E 33° 34.650'
33	11.04.07	28.07.07	28.11.07	-	Ahi beach, (East side)	N 36° 08.990'; E 33° 29.961'
34	11.04.07	28.07.07	28.11.07	-	Ağaçlı beach / Mersin	N 36° 09.382'; E 33° 28.917'
35	11.04.07	28.07.07	28.11.07	-	Eskur-2 beach / Mersin	N 36° 09.315'; E 33° 26.548'
36	11.04.07	28.07.07	28.11.07	-	Aydıncık beach / Mersin	N 36° 09.248'; E 33° 21.204'
37	11.04.07	28.07.07	-	-	Soğuksu beach / Mersin	N 36° 08.144'; E 33° 17.744'
38	11.04.07	28.07.07	28.11.07	15.09.08	Tekeli beach / Mersin	N 36° 08.281'; E 33° 09.728'
39	11.04.07	-	-	-	Gözsüzce beach / Mersin	N 36° 08.934'; E 33° 07.734'
40	11.04.07	28.07.07	28.11.07	-	Bozyazı beach / Mersin	N 36° 06.023'; E 32° 58.201'
41	11.04.07	28.07.07	29.11.07	15.09.08	Mamure castle beach / Mersin	N 36° 05.167'; E 32° 54.354'
42	12.04.07	29.07.07	29.11.07	-	Anamur beach / Mersin	N 36° 04.319'; E 32° 52.271'
43	12.04.07	29.07.07	29.11.07	-	2 km east of Anamuryum / Mersin	N 36° 01.959'; E 32° 48.749'
44	12.04.07	29.07.07	29.11.07	-	Melleç beach / Mersin	N 36° 02.582'; E 32° 41.029'
45	12.04.07	29.07.07	29.11.07	-	Kaledran beach / Mersin	N 36° 05.932'; E 32° 34.066'
46	12.04.07	29.07.07	29.11.07	-	Gazipaşa marina / Antalya	N 36° 16.137'; E 32° 16.783'
47	12.04.07	29.07.07	29.11.07	-	East of Demirtaş /Antalya	N 36° 22.930'; E 32° 11.374'
48	12.04.07	29.07.07	29.11.07	15.09.08	Drita Hotel beach , Mahmutlar /Antalya	N 36° 27.821'; E 32° 07.133'
49	12.04.07	29.07.07	29.11.07	-	Alanya Krizantem hotel beach / Antalya	N 36° 32.066'; E 32° 02.028'
50	12.04.07	29.07.07	29.11.07	-	Payallar beach / Antalya	N 36° 35.549'; E 31° 50.348'

51	12.04.07	29.07.07	29.11.07	-	İncekum beach/ Antalya	N 36° 38.250'; E 31° 44.794'
52	12.04.07	29.07.07	29.11.07	-	10 km east of İncekum / Antalya	N 36° 40.720'; E 31° 37.163'
53	12.04.07	30.07.07	30.11.07	-	Side / Antalya	N 36° 46.757'; E 31° 23.268'
54	12.04.07	30.07.07	30.11.07	-	Kumköy Diamond hotel beach / Antalya	N 36° 47.977'; E 31° 21.400'
55	13.04.07	30.07.07	30.11.07	15.09.08	Belek beach / Antalya	N 36° 50.473'; E 31° 04.793'
56	13.04.07	30.07.07	30.11.07	-	Kumköy beach / Antalya	N 36° 51.256'; E 30° 55.846'
57	13.04.07	30.07.07	30.11.07	-	Lara beach / Antalya	N 36° 51.031'; E 30° 50.966'
58	13.04.07	30.07.07	30.11.07	16.09.08	Konyaaltı beach / Antalya	N 36° 52.172'; E 30° 39.122'
59	13.04.07	30.07.07	01.12.07	-	Küçükçaltıcak beach, Kemer / Antalya	N 36° 47.710'; E 30° 34.490'
60	13.04.07	30.07.07	01.12.07	-	Mirage hotel beach, Göynük / Antalya	N 36° 39.667'; E 30° 33.670'
61	13.04.07	31.07.07	01.12.07	-	East of Kemer / Antalya	N 36° 37.291'; E 30° 33.399'
62	13.04.07	31.07.07	01.12.07	16.09.08	Phaselis beach / Antalya	N 36° 31.624'; E 30° 33.087'
63	13.04.07	31.07.07	01.12.07	16.09.08	Çıralı beach / Antalya	N 36° 24.320'; E 30° 28.747'
64	13.04.07	31.07.07	01.12.07	-	Çavuşköy (Adrasan) beach / Antalya	N 36° 17.948'; E 30° 28.131'
65	13.04.07	31.07.07	01.12.07	-	Karaöz beach / Antalya	N 36° 16.467'; E 30° 24.543'
66	13.04.07	31.07.07	01.12.07	-	Mavikent beach / Antalya	N 36° 17.269'; E 30° 20.491'
67	14.04.07	31.07.07	01.12.07	16.09.08	Hasyurt intersection / Antalya	N 36° 18.913'; E 30° 11.915'
68	14.04.07	31.07.07	-	-	3 km east of Finike, Sahilkent / Antalya	N 36° 18.491'; E 30° 09.857'
69	14.04.07	31.07.07	01.12.07	-	Çağıllı beach, Finike / Antalya	N 36° 16,743'; E 30° 08.392'
70	14.04.07	31.07.07	01.12.07	-	Beymelek / Antalya	N 36° 15.200'; E 30° 02.938'
71	14.04.07	31.07.07	01.12.07	16.09.08	Çayağzı (Andreaca) / Antalya	N 36° 13.611'; E 29° 56.632'
72	14.04.07	01.08.07	01.12.07	16.09.08	3 km west of Kaş / Antalya	N 36° 12.395'; E 29° 36.087'
73	14.04.07	01.08.07	01.12.07	-	Kalkan road, Mavimağara / Antalya	N 36° 13.722'; E 29° 26.955'
74	14.04.07	01.08.07	01.12.07	-	Patara beach / Antalya	N 36° 15.162'; E 29° 18.720'
75	14.04.07	01.08.07	01.12.07	-	Patara beach, Eşen river estuary /Antalya	N 36° 17.569'; E 29° 15.733'
Y1	-	25.07.07	24.11.07	-	100 m south of Asi River, Samandağ / Hatay	N 36° 02.774'; E 35° 57.753'
Y2	-	25.07.07	24.11.07	-	North of Samandağ beach/ Hatay	N 36° 15.344'; E 35° 49.028'
Y3	-	25.07.07	-	-	South of Kale Village / Hatay	N 36° 17.204'; E 35° 47.325'
Y4	-	25.07.07	24.11.07	-	Kale Village / Hatay	N 36° 17.439'; E 35° 47.087'
Y5	-	25.07.07	24.11.07	-	Tepe Restaurant Beach / Hatay	N 36° 22.905'; E 35° 51.586'
Y6	-	25.07.07	24.11.07	-	İkem Collage beach, İskenderun / Hatay	N 36° 34.965'; E 36° 08.316'
Y7	-	24.07.07	25.11.07	-	Zeytinbeli beach / Adana	N 36° 45.997'; E 35° 44.163'
Y8	-	24.07.07	25.11.07	-	Bahçe beach / Adana	N 36° 35.501'; E 35° 26.163'
Y9	-	24.07.07	25.11.07	-	Rıhtım motel beach, Karataş / Adana	N 36° 33.955'; E 35° 23.416'
Y10	-	26.07.07	26.11.07	-	Karaduvar / Mersin	N 36° 48.494'; E 34° 41.242'
Y11	-	27.07.07	27.11.07	-	Tisan beach / Mersin	N 36° 09.414'; E 33° 41.042'
Y12	-	29.07.07	29.11.07	-	Dragon kamping beach, Mamure/ Mersin	N 36° 04.806'; E 32° 53.480'
Y13	-	30.07.07	30.11.07	-	Boğazkent beach / Antalya	N 36° 49.866'; E 31° 09.394'
Y14	-	31.07.07	01.12.07	-	Papaz bay beach, Mavikent / Antalya	N 36° 16.742'; E 30° 23.577'

Results

Nine ectinosomatid species which belong to five genera were identified. The identified species, their localities, numbers and distribution along the coasts of Turkey are given below:

Family: Ectinosomatidae Sars, 1903

Genus: *Ectinosoma* Boeck, 1865

Ectinosoma soyeri Apostolov, 1975 (Figure 2)

Material examined

1. Sampling :St.7 (1♂), St.8 (5 ♀♀, 7 ♂♂), St. 9 (3♀♀, 1♂), St.17 (2♀♀, 2 ♂♂), St.23 (3♀♀, 4♂♂), St.30 (1♀), St.43 (1♂), St.44 (1♀), St.48 (2♀♀), St.50 (1♂), St.60 (17 ♀♀, 12 ♂♂), St.62 (3♀♀, 1♂), St.63 (6♀♀, 3♂♂), St.69 (6♀♀, 6♂♂), St.73 (1♀), St. 74 (1♀). *2. Sampling* :St. 3 (1♀), St.11 (1♂), St.18 (4♀♀), St.32 (1♀), St.33 (8♀♀, 2♂♂), St.35 (1♀, 2♂♂), St.38 (1♂), St.48 (1♂), St.49 (1♂), St.69 (7♀♀, 13♂♂), St.70 (1♀), St.Y11 (♀, 1♂) *3. Sampling* St.23 (2♀♀), St.26 (33♀♀, 10♂♂), St.44 (2♀♀), St.48 (6♀♀, 5♂♂), St.49 (1♀, 1♂), St.58 (6 ♀♀, 4 ♂♂), St.69 (5♀♀, 9♂♂), St.73 (1♀), St.Y11 (1♀, 1♂), St.Y14 (1♀).

Distribution in Turkey

Datça-Bozburun Peninsula (Alper et al., 2010).

Short description

Body elongate, fusiform, without clear distinction between urosome and prosome (Fig. 2 A, B). Numerous rectangular pores on body surface (Fig. 2 D). Abdominal somites ornamented with spinular rows dorsally and ventrally. Furcal rami cylindrical with 7 setae. Pseudo-operculum distinctive, triangular (Fig. 2 C). Antennule short and seven segmented. Maxilla straight with 3 segmented endopod. Maxilliped elongated, syncoxa bears a seta. Baseoendopod and exopod of the fifth leg fused with a demarcation line on posterior surface; exopod with spinular ornamentation and a por on surface, bears 4 marginal setae, without surface seta; baseoendopodal lobe with one short, robust seta and two long spinulose setae. Setal formula of the swimming legs:

P1		P2		P3		P4	
Exp.	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**
0.1.122	1.1.221	1.1.222	1.1.221	1.1.222	1.1.221	1.1.222	1.1.221

Ectinosoma melaniceps Boeck, 1865 (Figure 3)

Material examined

1. Sampling St.21 (1♀); *2. Sampling* St.23 (1♀), St.29 (1♂), St.43 (1♂), St.51 (1♂), St.Y13 (1♂); *3. Sampling* St.60 (1♀), St.65 (1♂), St.71 (1♀), St.Y2 (1♂).

Distribution in Turkey

Sea of Marmara, (Noodt, 1955), Edremit Bay (Karaytuğ & Sak,2006).

Short description

Body as in *E. soyeri* (Fig. 3 A, B). Cephalothorax with spinule like chitinious structures on posteriodorsal margin. Furca with two pores distally and hyaline frills on mediodorsal surface. Pseudo-operculum parabolic shaped. Baseoendopod and exopod of the fifth leg fused with a clear demarcation line on posterior surface; exopod with spinular ornamentation, bears four marginal setae, without surface seta; baseoendopodal lobe with one short and one long spinulose setae. Setal formula of the swimming legs:

P1		P2		P3		P4	
Exp.	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**
0.1.222	1.1.221	1.1.223	1.1.221	1.1.323	1.1.221	1.1.323	1.1.221

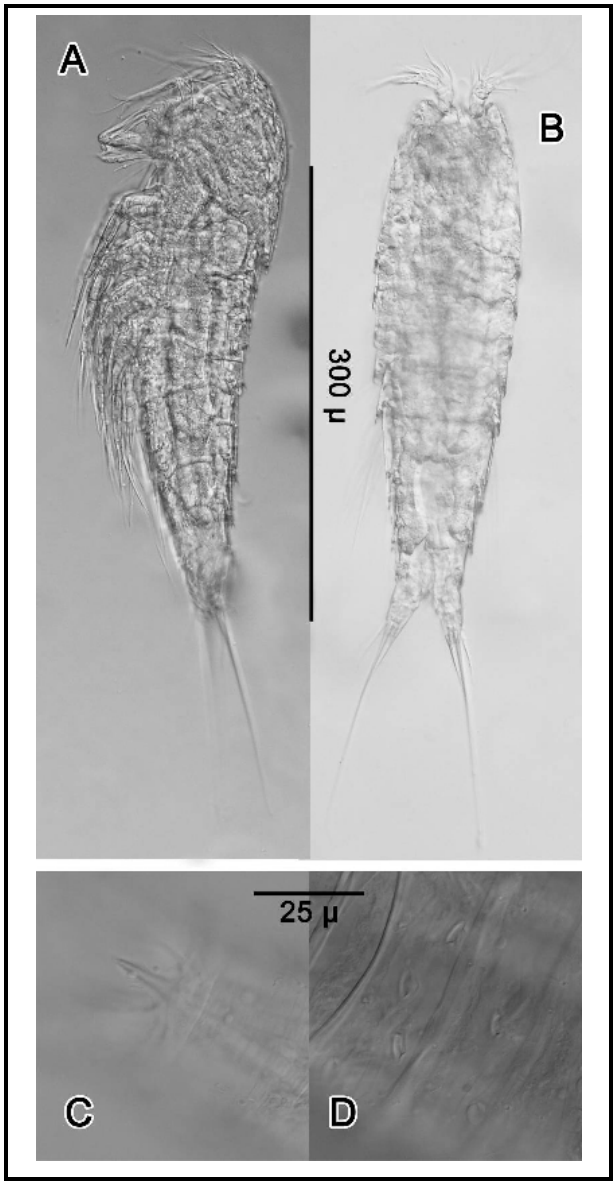

Figure 2. *Ectinosoma soyeri*,♀; A. Habitus, lateral; B. Habitus, dorsal; C. Pseudo-operculum; D. Rectangular pores on body surface.

Figure 3. *Ectinosoma melaniceps*, ♀, Habitus, A. Dorsal; B. Lateral

Ectinosoma reductum Bozic, 1955 (Figure 4)

Material examined

3. Sampling St.46 (4♀♀, 2 ♂♂).

Distribution in Turkey

New record.

Short description

Body laterally compressed, fusiform, without clear distinction between urosome and prosome (Fig. 4 A, B). Rostrum semi fused at base, bended ventrally. Posterior margin of cephalothorax ornamented with chitinious lines. Posterior margins of urosomites ornamented with finger like hyaline frills. Pseudo-operculum distinctive, naked and ligulate. Baseoendopod and exopod of the fifth leg fused with a clear demarcation line on posterior surface, with spinular rows near basal margin of exopod; baseoendopod with two spinulose setae distally and a naked seta basally; exopod with 4 marginal setae, without surface seta. Setal formula of the swimming legs:

P1		P2		P3		P4	
Exp.	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**
0.1.222	1.1.221	1.1.223	1.1.221	1.1.223	1.1.221	1.1.223	1.1.221

Genus: *Halectinosoma* Lang, 1944

Halectinosoma herdmani (T. Scott, 1894) (Figure 5)

Material examined

1. Sampling St.21 (5♂♂); *2. Sampling*: St.20 (2♂♂), St.51 (2♂♂), St.Y5 (4♂♂); *3. Sampling* St.21 (2♂♂), St.Y8 (1♂); *4. Sampling* St.32 (1♀), St.10 (1♂).

Distribution in Turkey

New record.

Short description

Body elongate, fusiform, without clear demarcation between urosome and prosome, cephalothorax elongated and narrows anteriorly (Fig. 5 A, B). Rostrum clearly longer than wide, shaped like a rectangle with a circular tip, bears two sensillae (Fig. 5 C, D). Pseudo-operculum well developed, convex shaped and naked. Antennules short and 7 segmented. Antenna exopod 3 segmented. Maxilla straight. Maxilliped elongated. Furcal rami cylindrical with 7 setae. P5 exopod wider than long, with clear demarcation between exopod and baseoendopod ; baseoendopod with spinular row on inner distal margin and two spinulose setae, outer basal seta naked. Anterior surface of exopod ornamented with spinular rows on anterior surface, bears 3 marginal spinulose setae and a surface seta originated near baseoendopod and exopod demarcation line. Setal formula of the swimming legs:

P1		P2		P3		P4	
Exp.	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**
0.1.123	1.1.221	1.1.223	1.1.221	1.1.323	1.1.221	1.1.323	1.1.221

Genus*: Microsetella* Brady and Robertson, 1873

Microsetella norvegica (Boeck, 1865) (Figure 6)

Material examined

1. Sampling St.3 (2♀), St.40 (1♀), St.75 (1♀); *2. Sampling* St.23 (8♀♀, 1♂, St.43 (1♀), St.45 (1♀, 1♂), St.51 (2♂♂), St.63 (1♂), St.73 (2♀♀), St.74 (7♀♀, 2♂♂), St.75 (2♀♀), St.Y12 (1♂); *3. Sampling* St.2 (1♂), St.4 (1♂), St.15 (2♀♀), St.25 (4♀♀, 4♂♂), St.26 (1♀), St.31 (3♀♀), St.38 (1♀), St.48 (1♂), St.55 (1♂), St.57 (1♂), St.58 (2♀♀, 2♂♂), St.60 (6♀♀, 1♂), St.61 (1♂), St.62 (1♂), St.64 (1♂), St.70 (5♂♂), St.73 (11♀♀, 11♂♂), St.74 (1♀, 1♂), St.75 (8♀♀, 3♂♂), St.Y4 (4♀♀), St.Y6 (1♀), St.Y11 (1♀, 2♂♂), St.Y13 (25♀♀, 20♂♂).

Distribution in Turkey

Datça-Bozburun Peninsula (Alper et al., 2010)

Short description

Body laterally depressed, fusiform (Fig. 6 A). Rostrum short, bended laterally at tip. Somites with spinular ornamentation at dorsal surface (Fig. 6 C). Anal operculum parabolic shaped with a spinular row apically (Fig. 6 B). Furcal seta V little longer than the entire body (Fig. 6 A). Antennule 6 segmented, the third segment elongated. Antenna with three segmented exopod. Maxilla straight with wide allobasis. Maxilliped robust. P5 baseoendopod and exopod fused in female, distinct in male. Baseoendopod with two spinulose setae. Exopod with one minute and two long spinulose marginal setae and a naked surface seta which originates near distal margin and has a spinular row at base. Setal formula of the swimming legs:

P1		P2		P3		P4	
Exp.	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**
0.1.122	1.1.221	1.1.222	1.1.221	1.1.322	1.1.221	1.1.322	1.1.221

Microsatella rosea (Dana, 1848) (Figure 7)

Material examined

3. Sampling St.41 (1♀).

Distribution in Turkey

New record.

Short description

Body, rostrum, anal operculum, antennule, antenna, maxilla, maxilliped and P5 as in *M. norvegica*(Fig. 7 A-C). Furcal seta V about twice as long as entire body (Fig. 7 A). Setal formula of the swimming legs:

P1		P2		P3		P4	
Exp.	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**
0.1.122	1.1.221	1.1.222	1.1.221	1.1.322	1.1.221	1.1.322	1.1.221

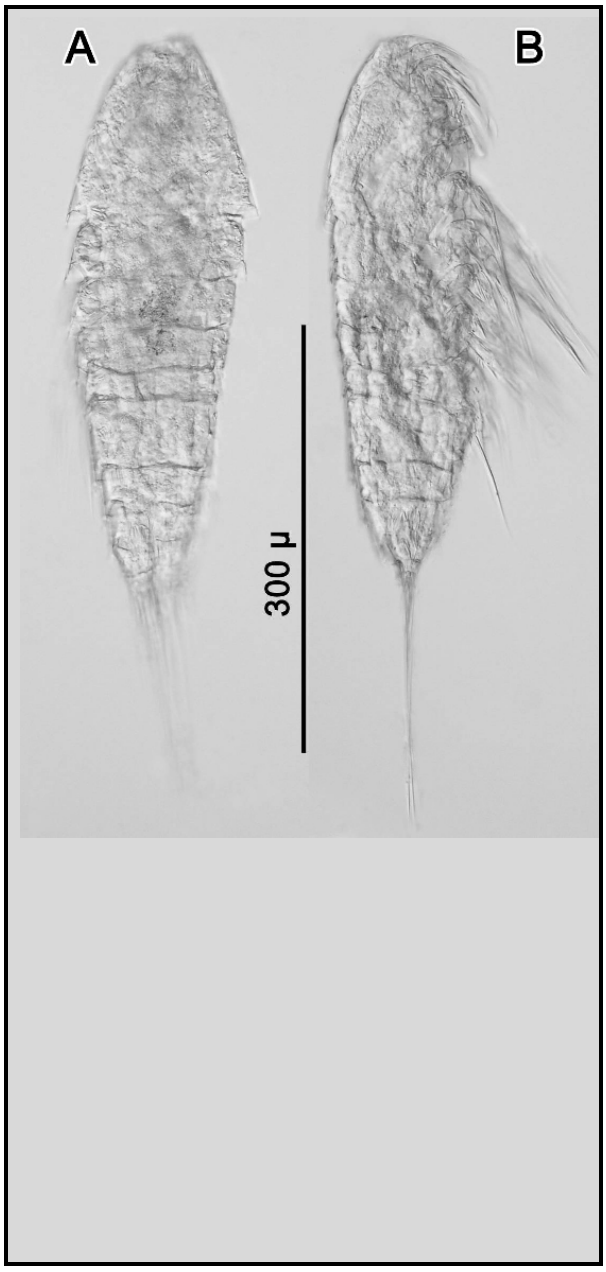

Figure 4 *Ectinosoma reductum*, ♀. Habitus, A. Dorsal; B. Lateral

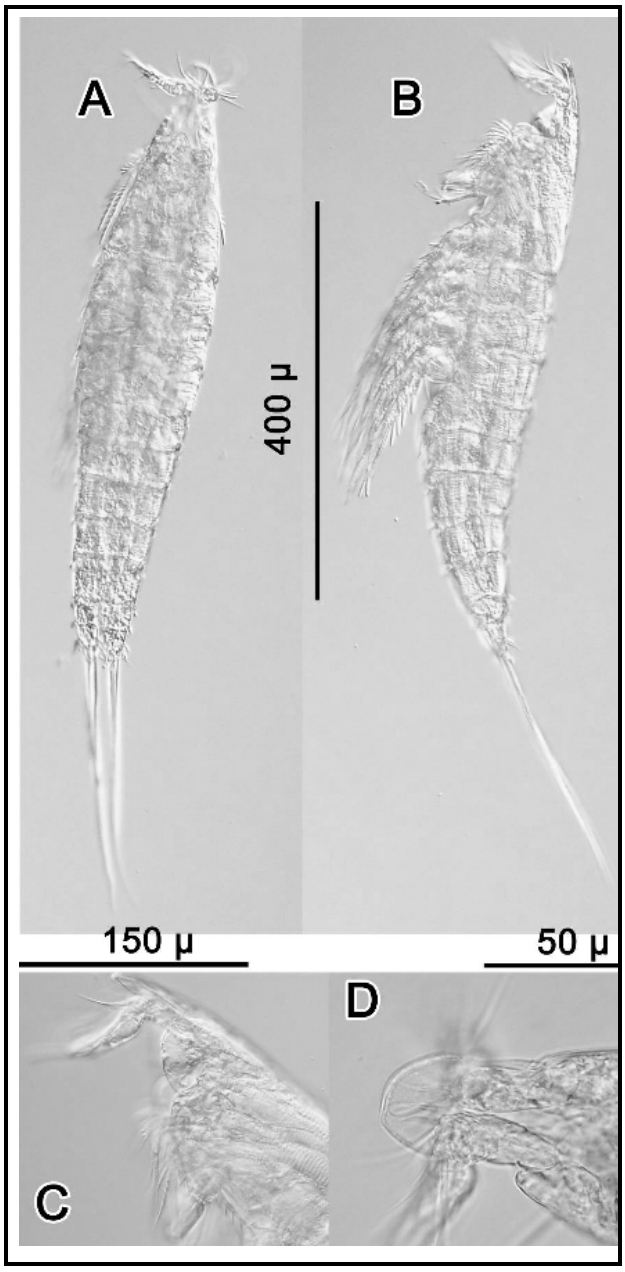

Figure 5 *Halectinosoma herdmani*, ♂. A. Habitus, dorsal; B. Habitus, lateral; C. Rostrum, lateral; D. Rostrum, dorsal

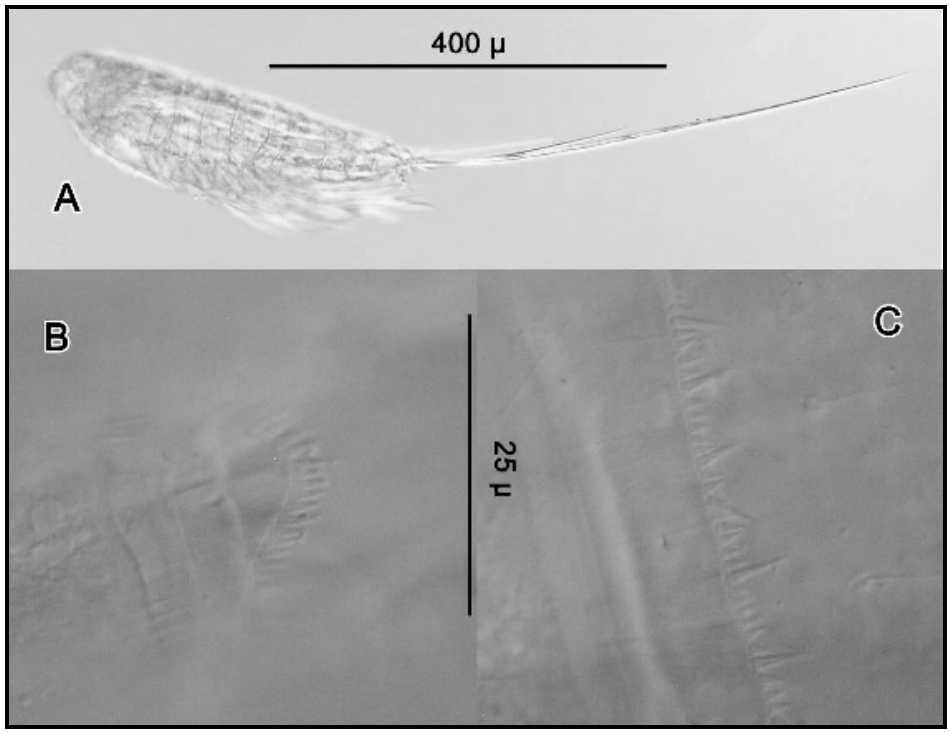

Figure 6 *Microsetella norvegica* , ♀ A. Habitus lateral, B. Pseudo-operculum, C. Spinular ornamentation on body surface.

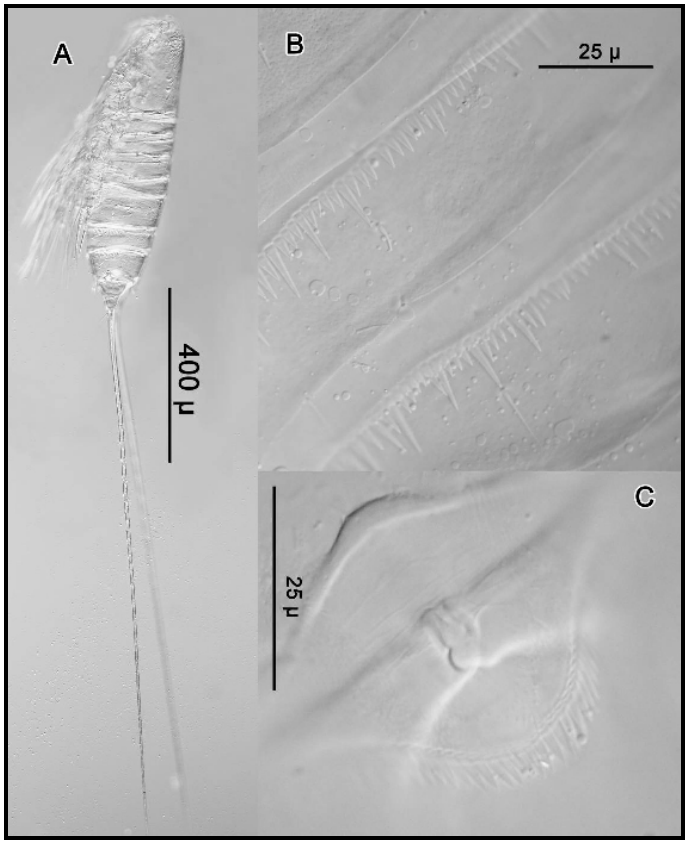

Figure 7 *Microsetella rosea*, ♀. A. Habitus lateral; B. Spinular ornamentation on body surface. C. Pseudo-operculum.

Genus: *Hastigerella* Nicholls, 1935

Hastigerella bodini Apostolov, 1974 (Figure 8)

Material examined

1. Sampling St.8 (4♀♀), St.11 (4♀♀, 4♂♂), St.32 (1♀), St.38 (4♀♀), St.64 (1♀), St.65 (7♀♀, 7♂♂), St.67 (15♀♀, 23♂♂); *2. Sampling* St.63 (2♀♀, 1♂), St.67 (44♀♀, 9♂♂); *3. Sampling* St.11 (18♀♀, 10♂♂), St.60 (1♀), St.67 (34♀♀, 15♂♂).

Distribution in Turkey

Datça-Bozburun Peninsula (Alper et al., 2010)

Short description

Body cylindrical (Fig. 8 A, B). Posterior margins of the somites ornamented with fence like hyaline frills (Fig. 8 D). Pseudo-operculum not distinct, anal somite without dorsal ornamentation (Fig. 8 C). Antennule short, six segmented. Antenna with 3 segmented exopod. Maxilla straight with elongated allobasis, endopod short. Maxilliped elongated. P1-P4 with 3 segmented endopod and exopod. P5 baseoendopod and exopod fused; exopod with 3 marginal and one surface seta. Setal formula of the swimming legs:

P1		P2		P3		P4	
Exp.	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**
0.1.122	1.1.221	1.1.222	1.2.221	1.1.222	1.2.221	1.1.222	1.2.221

Hastigerella bozici Soyer, 1974 (Figure 9)

Material examined

1. Sampling St.6 (9♀♀).

Distribution in Turkey

New record.

Short description:

Body as in *H. bozici* (Fig. 9 A, B). Pseudo-operculum not clear, anal somite without dorsal ornamentation. Antennule short, 7 segmented. Antenna with 3 segmented exopod. Maxilla straight with elongated allobasis. Maxilliped elongated. P1-P4 with 3 segmented rami. P5 baseoendopod and exopod fused exopod with 3 marginal setae and one surface seta. Setal formula of the swimming legs:

P1		P2		P3		P4	
Exp.	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**
0.1.122	1.1.220	0.1.222	0.1.220	0.1.222	1.1.220	0.1.222	1.1.220

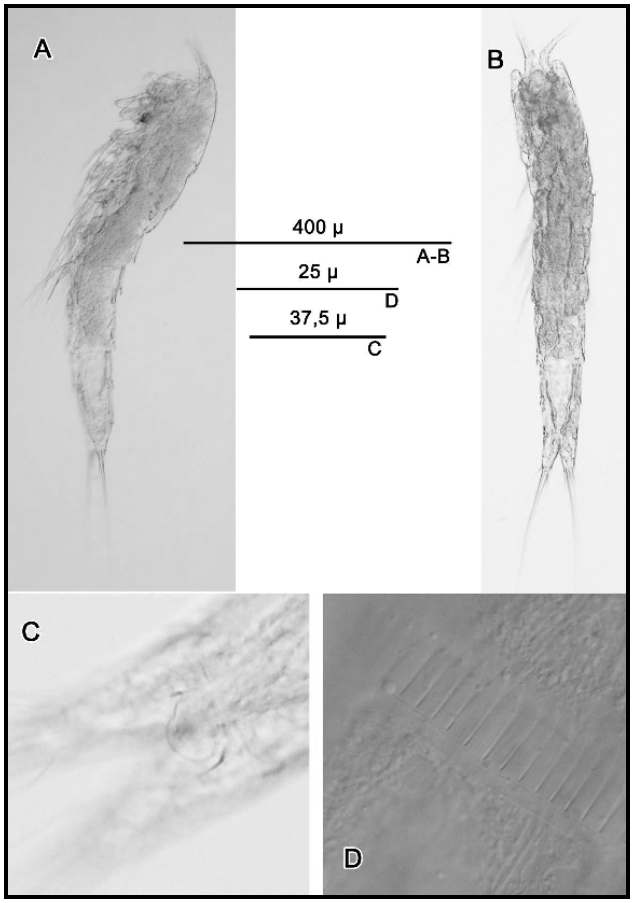

Figure 8 *Hastigerella bodini*, ♀. A. Habitus lateral; B. Habitus dorsal; C. Pseudo-operculum; DHyalin frills on abdominal somites.

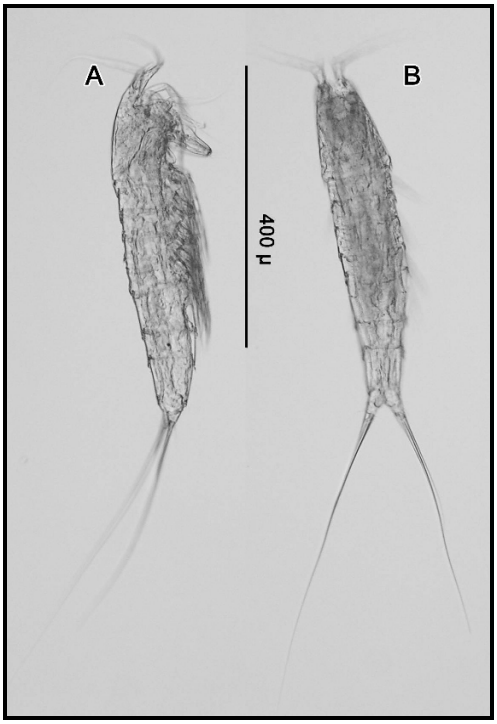

Figure 9 *Hastigerella bozici*, ♀. A. Habitus lateral; B. Habitus dorsal.

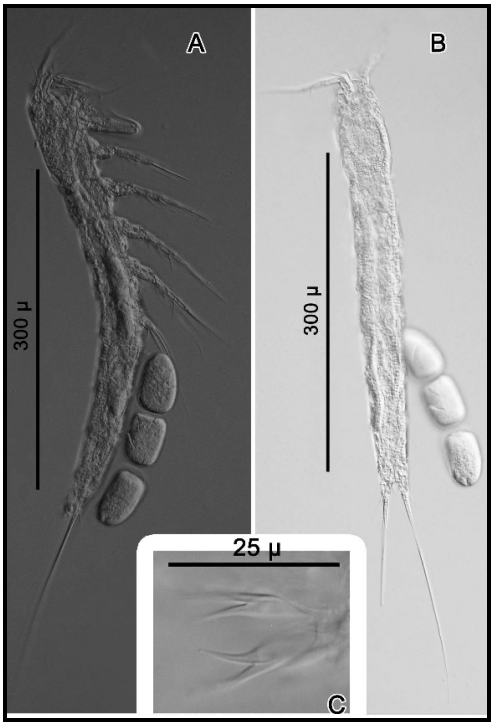

Figure.10 *Arenosetella germanica*, ♀ A. Habitus lateral, B. Habitus dorsal,C. Anal somite dorsal ornamentation.

Genus: *Arenosetella* Wilson, 1932

Arenosetella germanica Kunz, 1937 (Figure 10)

Material examined

1. Sampling St.4 (9♀♀, 8♂♂), St.6 (1♀, 1♂), St.8 (15♀♀, 7♂♂), St.9 (31♀♀, 7♂♂), St.10 (1♀, 4♂♂), St.11 (22♀♀, 6♂♂), St.13 (2♀♀), St.30 (1♀, 2♂♂), St.32 (4♀♀), St.51 (4♀♀), St.55 (43♀♀, 9♂♂), St.56 (1♀); *2. Sampling* St.3 (28♀♀, 9♂♂), St.5 (3♀♀, 1♂), St.9 (5♀♀, 2♂♂), St.16 (1♀), St.17 (2♀♀), St.18 (1♀, 4♂♂), St.32 (3♀♀), St.34 (9♀♀), St.40 (4♀♀, 1♂), St.51 (11♀♀, 3♂♂), St.Y6 (5♀♀, 4♂♂); *3. Sampling* St.2 (5♀♀, 1♂), St.4 (7♀♀, 3♂♂), St.5 (1♂), St.7 (1♀, 1♂), St.8 (4♀♀), St.9 (4♀♀, 1♂), St.16 (3♀♀, 2♂♂), St.22 (10♀♀, 14♂♂), St.25 (3♀♀), St.32 (10♀♀, 4♂♂), St.41 (1♀), St.46 (1♂), St.51 (6♀♀, 2♂♂), St.53 (15♀♀, 6♂♂), St.55 (9♀♀, 2♂♂), St.62 (39♀♀, 23♂♂), St.Y6 (9♀♀, 2♂♂), St.Y7 (9♀♀, 3♂♂), St.Y10 (19♀♀, 8♂♂); *4. Sampling*: St. 32 (5♀♀, 2♂♂), St. 8 (3♀♀, 1♂).

Distribution in Turkey

Edremit Bay (Karaytuğ & Sak, 2006), Datça-Bozburun Peninsula (Alper et al., 2010).

Short description

Body cylindrical, cephalothorax rectangular in dorsal view, rostrum distinctive and fused at base (Fig. 10 A, B). Posterior margins of the body somites except penultimate and anal somite are ornamented with fence like hyaline frills. Pseudo-operculum distinctive and triangular shaped. Anal somite bears a bifid plate with two symmetric, strongly built, mucroniform projections originating from a common base (Fig. 10 C). Furca with seven naked setae. Antennule short, 6 segmented. Antenna exopod with 3 segmented exopod. Maxilla straight, syncoxa with three endites, allobasis well developed; endopod short. Maxilliped cylindrical and elongated. P1-P4 with 3 segmented rami. P5 baseoendopod and exopod fused; baseoendopod bears 2 setae; exopod with 3 marginal setae and one surface seta. Setal formula of the swimming legs:

P1		P2		P3		P4	
Exp.	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**	**Exp.**	**Enp.**
0.1.122	1.1.121	1.1.122	1.2.121	1.1.122	1.2.121	1.1.222	1.2.121

Discussion

Only three harpacticoid species have been recorded from Mediterranean coasts of turkey so far. First one was a pelagic harpacticoid *Euterpina acutifrons* (Dana, 1847) (Euterpinidae Brian, 1921) which has been reported by Toklu and Sarıhan (2003) from İskenderun Bay. Then Sak et al. (2008) described new meiobenthic species namely *Ciplakastacus mersinensis* (Leptastacidae) from İncekum beach , Mersin. Recently Karaytuğ et al (2010) described another new species, *Odaginiceps korykosensis*, from intertidal zone of Kızkalesi beach, Mersin. Therefore nine species that are identified here are the first records for the study area and four of them (*Ectinosoma reductum*, *Halectinosoma herdmani*, *Microsatella rosea* and *Hastigerella bozici*) are recorded for the first time from Turkish marine waters. On the basis of published data (Pulat et al., 2009; Alper et al., 2010; Karaytuğ et al., 2010, Kaymak et al., 2012) and with the results of this study, the number of harpacticoid species that have been recorded so far from Turkey has reached to 132.

It is interesting to note that among the 89 localities sampled during the intensive sampling made at four different times, *E. reductum*, *M. rosea*, *H. bozici* are only found in single locality with low individual numbers. Such `spot' distribution of these species may be explained by the restricted ecological requirements (Galassi et al., 1999)

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