

Deep-Water Decapod Crustacean Fauna of the Sigacık Bay, Aegean Sea Coast of Turkey

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Özet: Sığacık Körfezi (Türkiye'nin Ege Denizi kıyıları) derin deniz Dekapod Krustase Faunası. Bu araştırma, Temmuz 2005 ile Haziran 2006 arasında Sığacık Körfezi'nde yapılmıştır. Toplam 21 Dekapod türü 200-600 m arasında farklı derinliklerdeki 6 trol çekiminde yakalandı. 21 dekapod türü tanımlandı, bunlardan 2 Dendrobranchiata, 4 Caridea, 11 Brachyura, 2 Anomura, 1 Astacidea ve 1 Eryonidea tespit edilmiştir. Derinlik dağılımlarına göre 16 tür 300-400 m arası zonda bulunmuştur ve *Macropipus tuberculatus* (Roux, 1830) en bol olan türdür (%22.93).

Anahtar Kelimeler: Dekapod, derin su, Sığacık Körfezi, Ege Denizi.

Abstract: Surveys of this study were conducted between July 2005 and June 2006 in the Sigacık Bay. A total of 21 Decapod species was during caught in 6 trawl surveys at the different depths between 200 and 600 m. 21 decapod species were identified, of which 2 are Dendrobranchiata, 4 Caridea, 11 Brachyura, 2 Anomura, 1 Astacidea and 1 Eryonidea. Concerning their depth distribution, 16 species were found in 300-400 m zone, with brachyuran crab, *Macropipus tuberculatus* (Roux, 1830) being the most abundant species (22.93%).

Key Words: Decapod, deep-water, Sigacık Bay, Aegean Sea

Introduction

Studies on the assemblages of deep water decapod crustaceans have not been much dealt with on the Turkish coast. Sigacık Bay is an important commercial fishery ground for bathyal decapod crustaceans and fish. In this bay, shrimps are most valuable deep water resource. Decapod crustaceans of the deep-water in the Aegean Sea consists of Atlanto-Mediterranean originated and cosmopolitan species. Detailed several studies exist on deep decapod crustaceans on the Aegean Sea coast of Turkey. The previously available data on the decapod fauna found in the deep waters of the Aegean Sea was presented by Katağan et al. (1988), who reported 13 decapod species (7 Natantia, 3 Anomura, 3 Brachyura). Then, Kocataş and Katağan (2003) reported 7 new decapod species for the region, among which 6 are new for the Turkish seas. And then Sezgin et al. (2007) reported 3 decapod species. In the later study, Koçak and Katağan (2008) reported 5 anomuran species from the deep waters of the Turkish coast of the Aegean Sea.

The aim of the present study is to enrich the knowledge on the deep water decapod crustacean fauna of the Sigacık Bay. This information concerns the decapod faunistic composition, bathymetry of species, their frequency of occurrence, and abundance (Di%).

Material and Methods

The samples were collected at the depths of 200-600 m in the Sigacık Bay (GPS Coordinates 38°05'N26°35'E to

37°59'N26°54'E), where is located the eastern Aegean Sea during 6 commercial trawl surveys carried out from July 2005 to June 2006 (Fig. 1). The trawl was equipped with 20 mm mesh size net at the cod-end. Hauling lasted about one hour at a towing speed of 1.5 knots approximately. A total of 6 trawl hauls was carried out during the surveys. Several specimens belonging to each species were fixed on board with formalin of 4% and several specimens of each species were deposited in the Museum of Faculty of Fisheries, Mustafa Kemal University (MSM).

The species found herein were identified according to the studies of Zariquiey Álvarez 1968; Noël 1992; Ingle 1993 and Falciai and Minervini 1996. Nomenclature of the species follows Marine species (2009).

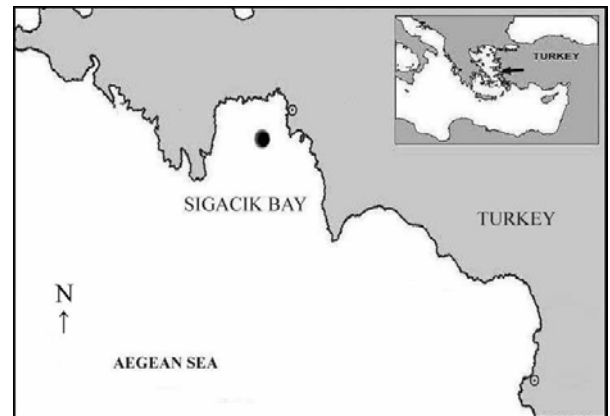


Fig. 1. Map showing the study area.

Results

In total 21 decapod species identified in the Sigacik Bay: 2 Dendrobranchiata, 4 Caridea, 11 Brachyura, 2 Anomura, 1 Astacidea and 1 Eryonidea (Table 1). In the depth zone of 200-300 m 12 species and 300-400 m 16 species were found. In addition, 4 species were found at the depths of 400-600 m. *M. tuberculatus* was the most abundant (Table 1). Most of the decapods, which were caught in this zone, belong to the infraorder Brachyura.

17 families were identified with Pandalidae (14.29 %), Majidae (9.52 %) and Parthenopidae (9.52 %) being the most abundant (3, 2, and 2 species, respectively) (Fig. 2). The highest number of species (16) was recorded at 300-400 m depth zone (76.19% of total for this survey). The lowest value (4 species) was found for the depth strata of 400-600 m, (19.05% of total for this survey). The penaeid shrimp, *Parapenaeus longirostris* (Lucas, 1846) was present in all depth zone. The brachyuran crab, *M. tuberculatus*, the penaeid shrimp, *P. longirostris*, the pandalid shrimp, *Plesionika heterocarpus* (Costa, 1871), Atlantic mud shrimp, *Solenocera membranacea* (Risso, 1816) and the norway lobster *Nephrops norvegicus* (Linnaeus, 1758) were the most frequently occurring species in trawl samples obtained in the bay (Table 1).

The norway lobster *N. norvegicus* and deep sea pink shrimp, *P. longirostris* captured in the study area are known

as target species, while the pandalid shrimps, *Chlorotocus crassicornis* (Costa, 1871), *Parapandalus narval* (Fabricius, 1787), *P. heterocarpus* and Atlantic mud shrimp, *S. membranacea* are non-target species or discard species.

Discussion

Several studies are present on the deep-water decapods of the eastern Mediterranean Sea, (i.e., Katağan et al., 1988, Kocataş and Katağan 2003, Galil 2004, Politou et al., 2003, 2005). There is only one detailed study that presents data on the deep-water decapods of the Turkish Aegean Sea (200-600 m) (Katağan et al., 1988).

Koçak and Katağan (2008) reported 5anomuran species, which are *Pagurus alatus* Fabricius, 1775, *Munida rutilanti* Zariquiey Álvarez, 1952, *Munida intermedia* A.Milne Edwards & Bouvier, 1899, *Munida tenuimana* G.O.Sars, 1872 and *Galathea dispersa* Bate, 1859, between 200 and 680 m depth on the Aegean Sea coast of Turkey. Among these, *P. alatus* was present in 100% rate and also two squat lobsters *G. dispersa* and *M. tenuimana* were present in 33.33% rate at the deepest stratum (600-700 m). The squat lobster, *M. rutilanti* was present in 100% of the samples taken between 200 and 400 m and another squat lobster, *M. intermedia* was only observed at the depth of 400 to 500 m, with an occurrence of 100%.

Table 1. Species composition, the number of individual at sampling stations, and dominance (Di%) values.

Species	Depth range (m)	Bathymetric Strata (m)			N	Dominance (Di%)
		200-300	300-400	400-600		
Natantia						
<i>Aegaeon lacazei</i> (Gourret, 1887)	200-600	-	16	1	17	2,04
<i>Chlorotocus crassicornis</i> (Costa, 1871)	300-400	-	54	-	54	6,48
<i>Parapandalus narval</i> (Fabricius, 1787)	300-400	-	41	-	41	4,92
<i>Parapenaeus longirostris</i> (Lucas, 1846)	200-600	64	98	22	184	22,09
<i>Pasiphaea sivado</i> (Risso, 1816)	400-600	-	-	1	1	0,12
<i>Plesionika heterocarpus</i> (Costa, 1871)	300-600	-	92	4	96	11,52
<i>Solenocera membranacea</i> (Risso, 1816)	200-400	9	117	-	126	15,13
Macrura Reptantia						
<i>Nephrops norvegicus</i> (Linnaeus, 1758)	300-400	-	86	-	86	10,32
<i>Polycheles typhlops typhlops</i> Heller, 1862	300-400	-	1	-	1	0,12
Anomura						
<i>Munida rutilanti</i> Zariquiey-Alvarez, 1952	200-400	2	8	-	10	1,20
<i>Pagurus prideaux</i> Leach, 1815	200-300	1	-	-	1	0,12
Brachyura						
<i>Calappa granulata</i> (Linnaeus, 1758)	200-400	1	1	-	2	0,24
<i>Goneplax rhomboides</i> (Linnaeus, 1758)	200-300	2	1	-	3	0,36
<i>Macropipus tuberculatus</i> (Roux, 1830)	200-400	24	167	-	191	22,93
<i>Macropodia longipes</i> (A. Milne-Edwards & Bouvier, 1899)	200-400	1	2	-	3	0,36
<i>Macropodia rostrata</i> (Linnaeus, 1761)	200-300	1	-	-	1	0,12
<i>Medorippe lanata</i> (Linnaeus, 1767)	200-400	8	1	-	9	1,08
<i>Parthenope macrochelos</i> (Herbst, 1790)	200-300	2	-	-	2	0,24
<i>Parthenope massena</i> (Roux, 1830)	200-300	-	2	-	2	0,24
<i>Pilumnus hirtellus</i> (Linnaeus, 1761)	200-300	2	-	-	2	0,24
<i>Xantho pilipes</i> A. Milne-Edwards, 1867	300-400	-	1	-	1	0,12
Total		117	688	28	833	100,00

Kocataş and Katağan (2003) reported the deep-water species on the Aegean Sea coasts of Turkey previously including the decapod, *Bathynectes maravigna* (Prestandrea, 1839), *Dorhynchus thomsoni* (Thomson, 1873), *Latreillia elegans* Roux, 1830, *M. tuberculatus*, *P. giglioli* (Senna, 1903), *Richardina fredericii* Lo Bianco, 1903. In the present study we were able to catch only *M. tuberculatus*.

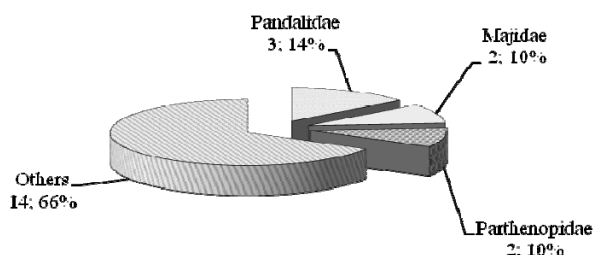


Fig. 2. Dominance values of the families of Decapoda (Initial: Number of species; Later: Percentage of dominance value)

D'Onghia et al. (2003) reported 31 crustaceans species along the coast of Italy and 26 crustaceans species along the coast of Greece. *P. heterocarpus* and *P. longirostris* were abundant along the coast of Greece, whereas *P. heterocarpus*, *N. norvegicus* and *P. longirostris* were abundant along the coast of Italy.

Politou et al. (2003) reported 25 decapod species from deep waters (300-900 m) of the Greek Ionian Sea (the eastern Mediterranean). These species were mostly dominant in the

500-700 m depth zone. Politou et al. (2005) reported 39 decapod species from deep waters (300-1200 m) of the same Ionian Sea region. They also pointed out that 30 of these species inhabit 300-500 m depth.

In the Sigacik and Kusadasi Bays mainline of fishing efforts was directed to shrimps, which are *P. longirostris*, *P. heterocarpus*, *Aegaeon lacazei* (Gourret, 1887) and *Pasiphaea sivado* (Risso, 1816) (Akçınar et al. 2007). So far a total of 21 crab species has been collected from this bay, which represents approximately 10.29 % of all decapod species known from the Aegean Sea coast of Turkey (Özcan et al., 2009, Ateş et al., 2009).

In the present study decapods of Sigacik Bay were mostly dominant in the depth zone of 300-400 m. The crab *M. tuberculatus* was the most abundant species and most of the decapods caught in this zone (300-400 m) belonged to the infraorder Brachyura.

Consequently, by means of this study, the number species of deep water decapod known to occur on the Aegean Sea coast of Turkey has increased to 29. Further studies on the zonation characteristics of decapod crustaceans in Turkish Seas are necessary to extend our knowledge regarding this subject.

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