

Decapod (Crustacea) Fauna of Saros Bay (Northeastern Aegean Sea)

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Abstract: The specific composition of decapod crustaceans collected in the sublittoral depths (8-135 m) of Saros Bay (northeastern Aegean Sea) is presented. A total of 40 species (17 Natantia, 1 Macrura Reptantia, 8 Anomura and 14 Brachyura) were recorded. The dominant taxon is Natantia, represented by a total of 17 species and an occurrence frequency of 42%.

Key Words: Decapoda Crustacea, Saros Bay, Northeastern Aegean Sea, Turkey

Saros Körfezi (Kuzeydoğu Ege Denizi) Decapod (Crustacea) Faunası

Özet: Saros Körfezi'nin (Kuzeydoğu Ege Denizi) sublittoral derinliklerinde (8-135 m) yakalanan dekapod krustaselerin spesifik kompozisyonu sunulmaktadır. Bu çalışmada toplam 40 tür (17 Natantia, 1 Macrura Reptantia, 8 Anomura and 14 Brachyura) kaydedilmiştir. Dominant takson 17 tür ve % 42'lik bulunma frekansıyla Natantia'dır.

Anahtar Sözcükler: Decapoda Crustacea, Saros Körfezi, Kuzeydoğu Ege Denizi, Türkiye

Introduction

The decapods of the Turkish Aegean Sea coast were not much studied until the 1970s (Forskål, 1775; Colombo, 1885; Kinzelbach, 1964; Geldiay and Kocataş, 1967, 1968a, 1968b, 1969; Mater and Kocataş, 1967; Geldiay, 1969) followed by a more prolific period since then (Geldiay and Kocataş, 1970, 1972), Kocataş, 1971, 1978, 1981; Özel, 1976; Katağan, 1980; Kocataş and Katağan, 1983; Katağan et al., 1988; Koçak et al., 2001; Balkis et al., 2001; Kocataş and Katağan, 2003. However, comprehensive studies on decapod diversity in the sublittoral zone of the Turkish Aegean Sea are still limited. The aim of the present study is to describe the species composition and diversity of sublittoral decapod fauna of Saros Bay, located in the northeastern Aegean Sea.

Materials and Methods

The sublittoral zone of Saros Bay, located in the northeastern Aegean Sea and Marmaris between 40° 37' 55" N 26° 43' 25" E and 40° 34' 20" N 26° 48' 26" E,

was chosen as the study area. A map of the sampling area is presented in Figure 1.

Samples were collected either by beam-trawl or dredge from a total of 17 stations (Table 1) at depths ranging between 8 and 135 m during July, August and September 2000. The characterization of biotopes indicated 3 distinct substrate types: 5 of the stations (5, 6, 11, 14 and 17) were muddy, 5 (1, 2, 9, 12 and 16) were sandy-muddy, and 7 (3, 4, 7, 8, 10, 13 and 15) were covered by *Posidonia oceanica* (L.) Delile meadows. A list of the sampling stations is shown in Table 1.

Immediately after collection, decapod samples were preserved in 70% alcohol. In the laboratory all decapods were counted and identified to species level whenever possible. Decapod species were identified based on the work of Zariquiey Alvarez (1968), Ingle (1993) and Falciai et Minervini (1996), using the European Register of Marine Species (ERMS) nomenclature (2003). Frequency was calculated by dividing each species count by the total number of all species combined and then multiplying the result by 100 (Table 2).

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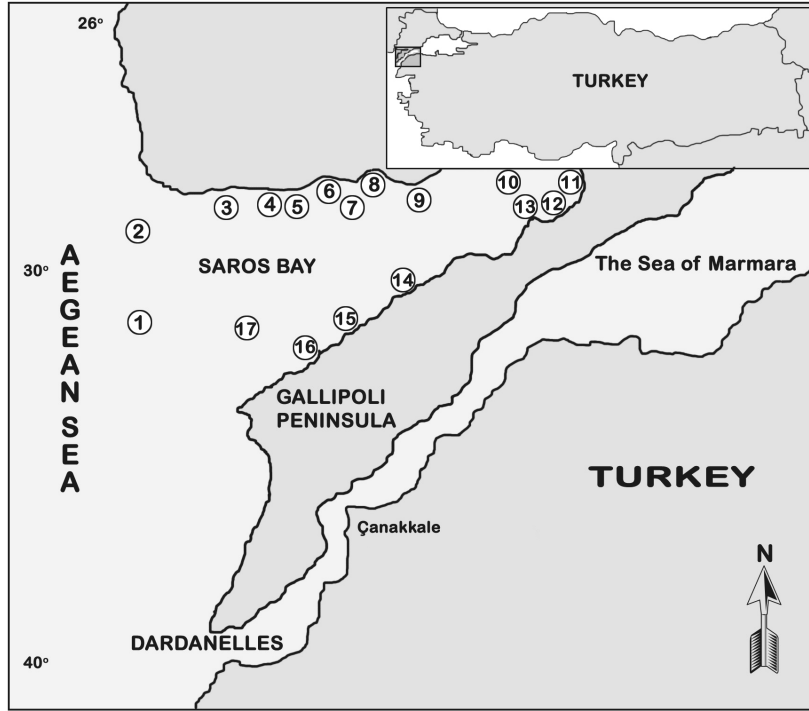


Figure 1. Sampling area.

Table 1. List of survey stations.

Stations	Date	Coordinates N/E	Sampling Gear	Depth (m)	Type of biotope
1	04.08.2000	40°29'30" N 25°55'40" E	D	63	Sandy muddy
2	04.08.2000	40°32'45" N 25°55'40" E	D	48	Sandy muddy
3	04.08.2000	40°34'18" N 26°06'59" E	D	16	<i>Posidonia</i>
4	04.08.2000	40°34'45" N 26°09'25" E	D	8	<i>Posidonia</i>
5	04.08.2000	40°32'30" N 26°20'00" E	D	88	Muddy
6	04.08.2000	40°32'45" N 26°25'15" E	D	93	Muddy
7	04.08.2000	40°35'50" N 26°22'40" E	D	24	<i>Posidonia</i>
8	04.08.2000	40°36'30" N 26°28'00" E	B	21	<i>Posidonia</i>
9	04.08.2000	40°33'00" N 26°30'20" E	D	82	Sandy muddy
10	04.08.2000	40°37'55" N 26°43'25" E	D	21	<i>Posidonia</i>
11	03.08.2000	40°36'02" N 26°49'30" E	D	12	Muddy
12	03.08.2000	40°34'20" N 26°48'26" E	D	20	Sandy muddy
13	03.08.2000	40°33'35" N 26°44'30" E	D	9	<i>Posidonia</i>
14	03.08.2000	40°27'40" N 26°29'57" E	D	135	Muddy
15	03.08.2000	40°25'38" N 26°25'57" E	D	8	<i>Posidonia</i>
16	03.08.2000	40°23'46" N 26°21'46" E	D	105	Sandy muddy
17	03.08.2000	40°27'55" N 25°34'23" E	D	109	Muddy

D : Dredge B: Beam-trawl

Table 2. Species composition, abundance and overall frequency of occurrence (% F) of decapod crustaceans collected in the sublittoral zone of Saros Bay, NE Aegean Sea.

Taxon	Stations																	F %
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
	63	48	16	8	88	93	24	21	82	21	12	20	9	135	8	105	109	
Depth (m)																		
Natantia																		
<i>Alpheus macrocheles</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.10
<i>Athanas nitescens</i>	-	-	-	1	-	-	-	-	1	-	1	-	1	-	34	1	-	3.99
<i>Crangon crangon</i>	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	0.82
<i>Hippolyte garciaraso</i>	-	-	-	-	-	-	-	2	-	-	-	-	19	-	-	-	-	2.15
<i>H. inermis</i>	-	-	-	18	-	-	1	3	-	-	-	-	239	-	174	-	-	44.48
<i>H. leptocerus</i>	-	-	-	-	-	-	1	-	-	-	-	-	37	-	6	-	-	4.50
<i>Lysmata seticaudata</i>	-	-	-	11	-	-	2	7	-	-	-	-	45	-	182	-	-	25.26
<i>Palaemon longirostris longirostris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	0.41
<i>Palaemon serratus</i>	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	1.33
<i>Pandalina brevirostris</i>	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	0.31
<i>Philocheras bispinosus bispinosus</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.10
<i>P. sculptus</i>	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	0.31
<i>Processa macrodactyla</i>	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	0.20
<i>P. macrophthalma</i>	-	-	-	2	-	-	-	11	3	1	-	-	3	-	39	-	-	6.03
<i>P. modica modica</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.10
<i>P. nouveli nouveli</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.10
<i>Solenocera membranacea</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.10
Macrura Reptantia																		
<i>Calocaris macandreae</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.10
Anomura																		
<i>Anapagurus petiti</i>	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	0.20
<i>Galathea bolivari</i>	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.10
<i>Galathea intermedia intermedia</i>	-	-	-	-	1	-	19	1	-	-	-	-	1	-	-	-	-	2.25
<i>Paguristes syrtensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	0.51
<i>Pagurus anachoretus</i>	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	0.31
<i>P. cuanensis</i>	-	-	-	-	-	-	7	-	-	-	-	2	1	-	-	-	-	1.02
<i>Pisidia bluteli</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10
<i>P. longimana</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-	-	0.31
Brachyura																		
<i>Achaeus cranchii</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.10
<i>Ebalia deshayesi</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.10
<i>E. nux</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.10
<i>E. tuberosa</i>	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	0.10
<i>E. tumefacta</i>	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	0.31
<i>Goneplax rhomboides</i>	2	2	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	0.61
<i>Inachus dorsettensis</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.10
<i>Liocarcinus corrugatus</i>	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10
<i>L. maculatus</i>	-	-	-	-	-	-	3	4	-	-	-	-	-	-	-	-	-	0.72
<i>Macropodia czerniavskii</i>	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	0.31
<i>M. rostrata</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	0.10
<i>Maja squinado</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	0.10
<i>Pilumnus hirsutus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	0.61
<i>Pisa hirticortis</i>	-	-	-	-	-	-	12	2	-	-	-	-	-	-	-	-	-	1.43

Results

A total of 978 individuals belonging to 40 decapod species were caught. Natantia was the most diversified group (17 species), followed by Brachyura (14), Anomura (8) and Macrura Reptantia (1). In terms of frequency, the caridean shrimp *Hippolyte inermis* was the dominant species (F = 44.48), followed by the caridean shrimps *Lysmata seticaudata* (25.26%), *Processa macrophthalma* (6.03%) and *H. leptocerus* (4.50%) (Table 2).

Total abundance of the groups was as follows: 42.5% the caridean shrimps, 35% brachyuran crabs, 20% anomuran crabs and 2.5% thalassid shrimps (Figure 2).

The numbers of species and specimens at the stations are shown in Figure 3.

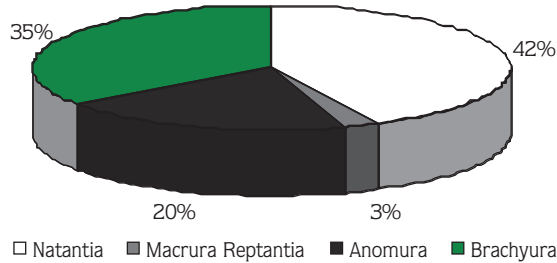


Figure 2. The percentage abundance of groups.

The *Posidonia oceanica* (L.) Delile meadows biotope had the richest fauna, being represented by 957 individuals (97.85% F) and 35 species, followed by the muddy biotope, represented by 10 individuals (1.02% F) and 7 species. The poorest biotope was the sandy-muddy substrate, represented by only 11 individuals (1.12% F) and 4 species (Figure 4).

Discussion

The results of studies on decapod fauna of Turkey were recently reviewed by Kocataş and Katağan (2003), who reported a total of 181 decapod species, i.e. 59 Natantia, 14 Macrura Reptantia, 33 Anomura and 75 Brachyura from the Aegean Sea coasts of Turkey including Saros Bay. In the present study, a total of 40 decapod species (17 Natantia, 14 Brachyura, 8 Anomura and 1 Macrura Reptantia) were reported from Saros Bay.

Of the 3 substrate types observed in the present study *Posidonia oceanica* (L.) Delile meadows have a crucial ecological importance. *P. oceanica* (L.) Delile is an endemic species in the infralittoral zones of the Mediterranean ecosystem and, harbors a great diversity of decapods (Zupo et al., 1989; García Raso, 1990; Zupo, 1990; García Raso et al., 1996; Dimech et al., 2002).

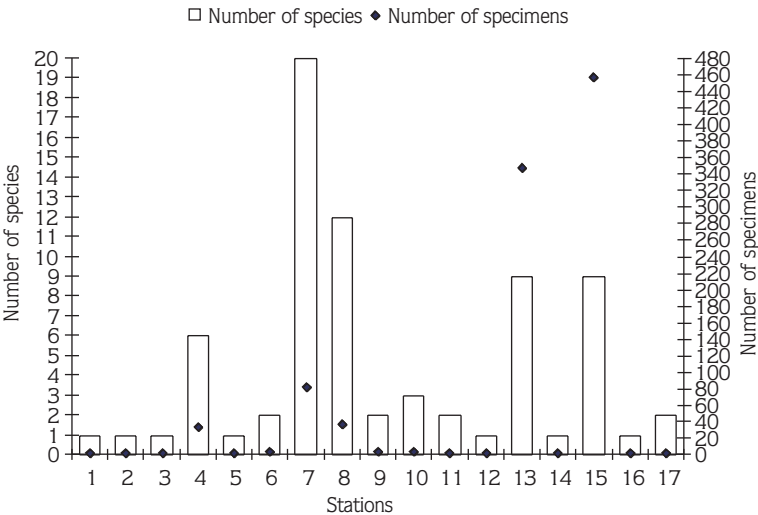


Figure 3. The numbers of species and specimens at the sampling stations.

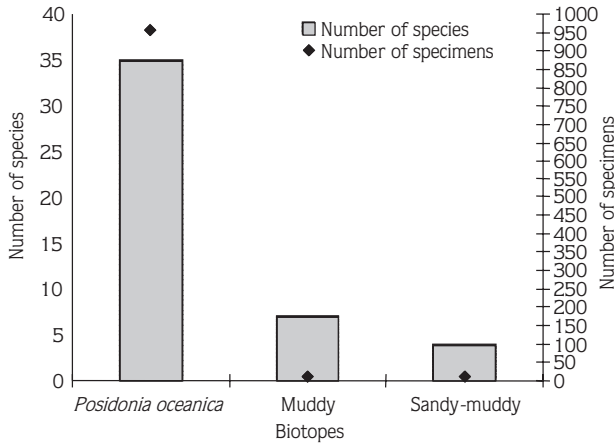


Figure 4. The number of species and specimens in biotopes.

References

- Balkis, H., Balkis, N. and Altınsoğlu, S. 2001. The crab species found on the coasts of Gökçeada (Imroz) in the Aegean Sea, *Hydrobiologia*. 449(1-3): 99-103.
- Colombo, A. 1885. Raccolte zoologiche esguitte dal R. Proscavo Washington nella compagna abissale talassografica dell'anno 1885, *Rivista Marittima*: 1-34.
- Dimech, M., Borg, J.A. and Schembri, P.J. 2002. Changes in the structure of a *Posidonia oceanica* meadow and in the diversity of associated decapod, mollusc and echinoderm assemblages, resulting from inputs of waste from a marine fish farm (Malta, Central Mediterranean). *Bull. Mar. Sci.* 71(3): 1309-1321.
- European register of marine species. 2003. <http://www.erns.biol.soton.ac.uk/list/brief/Decapoda.Shtml/Mars,27>.
- Falciati, L. and Minervini, R. 1996. Guide des Homards, Crabes, Longoustes, Crevettes et Autres Crustacés Décapodes d'Europe, Delachaux et Niestle SA, Lausanne-Paris, 287 pp.
- Forskål, P. 1775. *Descriptiones animalium, avium, amphibiorum, piscium, insectorum, vermium*. 164 pp.
- García Raso, J. E. 1990. Study of a Crustacea Decapoda Taxocoenosis of *Posidonia oceanica* beds from the southeast of Spain, *Mar. Ecol.*, 11(4): 309-326.
- García Raso, J.E., López de la Rosa, I. and Rosales, J.M. 1996. Decapod crustacean communities from calcareous seaweed and *Posidonia oceanica* (Rhizome stratum) in shallow waters, *Ophelia* 45(2): 143-158.
- Geldiay, R. and Kocataş, A. 1967. The two decapod crustaceans [*Scyllarides* (Scyllarus) *latus* Latr. and *Scyllarus arctus* L.] found in the Bay of İzmir and along the Aegean Sea shore [in Turkish]. Scientific Report of Faculty of Science, Ege University 49: 1-15, İzmir.
- Geldiay, R. and Kocataş, A. 1968a. Report on a collection of Natantia (Crustacea: Decapoda) from Bay of İzmir and its neighbourhood. Scientific Report of Faculty of Science, Ege University 51: 1-46, İzmir.
- Geldiay, R. and Kocataş, A. 1968b. Two species of crabs new for Turkey: *Brachynotus sexdentatus* Risso ve *Brachynotus* sp. Scientific Report of Faculty of Science, Ege University 51: 1-13, İzmir.
- Geldiay, R. and Kocataş, A. 1969. A report on the collection of Natantia (Crustacea, Decapoda) along the coast of Turkey from the Eastern Mediterranean to the vicinity of İzmir. Scientific Report of Faculty of Science, Ege University 7: 1-17, İzmir.
- Geldiay, R. and Kocataş, A. 1970. A report on the Anomura collected from the Aegean coast of Turkey (Crustacea: Decapoda). Scientific Report of Faculty of Science, Ege University 98: 1-35, İzmir.
- Geldiay, R. and Kocataş, A. 1972. A preliminary study on the benthos in İzmir Bay [in Turkish]. Scientific Report of Faculty of Science, Ege University 12: 1-34, İzmir.
- Ingle, R. 1993. Hermit crabs of the Northeastern Atlantic Ocean and Mediterranean Sea, *Nat. Hist. Mus. Pub.*, 495 p.
- Katağan, T. 1980. Investigations on Bio-Ecology of *Macropipus vernalis* (Risso, 1816) (Crustacea, Decapoda) from İzmir Bay [in Turkish]. Journal of Faculty of Science, Ege University 4: 61-83, İzmir.
- Katağan, T., Kocataş, A. and Benli, H.A. 1988. Note préliminaire sur les Décapodes bathyaux de la cote Turque de la Mer Egee, *Rapp. Comm. Int. Mer Médit.*, 31, 1-23.
- Kinzelbach, R. 1964. *Pachygrapsus transversus* (Gibbes, 1950) in der Aegäis (Crustacea: Decapoda), *Bonner Zool. Beitr.*, 15(3/4): 266-267.
- Koçak, C., Katağan, T. and Kocataş, A. 2001. Anomurans of the Aegean Sea coasts of Turkey and reported species from Turkish Seas, *Türk. J. Zool.* 25, 305-311.

- Kocataş, A. and Katağan, T. 1983. Crustacean Fauna of Turkish Coastal Lagoons, Rapp. Comm. Int. Mer Médit., 28 : 231-233.
- Kocataş, A. and Katağan, T. 2003. Decapod Crustacean Fauna of the Turkish Seas, Zool. in the Middle East, 29: 63-74.
- Kocataş, A. 1971. Investigation on the taxonomy and ecology of crabs "Brachyura" from İzmir Bay and its adjacent areas [in Turkish]. Scientific Report of Faculty of Science, Ege University 112: 1-77, İzmir.
- Kocataş, A. 1978. Contribution à l'étude des peuplements des horizons supérieurs de substrat rocheux du golfe d'Izmir [in Turkish]. Scientific Report of Faculty of Science, Ege University 12: 1-93, İzmir.
- Kocataş, A. 1981. Liste préliminaire et repartition des Crustacés Décapodes des eaux Turques, Rapp. Comm. Int. Mer. Médit., 27(2): 161-162.
- Mater, S. and Kocataş, A. 1967. Etude préliminaire sur les Brachyours du golfe d'Izmir [in Turkish]. Scientific Report of Faculty of Science, Ege University 38: 1-12, İzmir.
- Özel, İ. 1976. Bio-ecological investigations on the *Brachynotus sexdentatus* (Risso, 1827) (Decapoda, Brachyura), which is found in the İzmir Bay [in Turkish]. Scientific Report of Faculty of Science, Ege University 210: 1-19, İzmir.
- Zariquiey Alvarez, R. 1968. Crustáceos Decápodos Ibéricos, Investigacion Pesquera, 32, Barcelona, 510 p.
- Zupo V., Russo G.F., Fresi E. and Scardi M. 1989. Hermit crabs of a *Posidonia oceanica* bed: zonal patterns and shell selection. II Int. Workshop on *Posidonia oceanica* beds. GIS Posidonie publ., Fr., 2.
- Zupo V. 1990. I Decapodi delle praterie di *Posidonia oceanica*: confronto tra metodiche di campionamento in rapporto alla zonazione del taxon. Oebalia vol. XVI: 817-822.