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## BIVALVIA FAUNA of the IMBROS ISLAND (NE AEGEAN SEA)\*

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### SUMMARY

In this study, carried out with the purpose to determine the bivalve species of Imbros Island (NE Aegean Sea), a total of 65 species was determined as a result of examining the material obtained in 1998 and 1999 from 37 stations between the depths of 0.5-68 m by dredging and scuba diving. Six species of them [*Modiolula phaseolina* (Philippi, 1844), *Flexopecten glaber* (Linnaeus, 1758), *Kellia suborbicularis* (Montagu, 1803), *Acanthocardia aculeata* (Linnaeus, 1758), *Gari costulata* (Turton, 1822), *Coralliophaga lithophagella* (Lamarck, 1819)] were seen as new records for the fauna of the Aegean Sea coasts of Turkey, according to present literature.

**Key Words:** Bivalvia, Mollusca, Aegean Sea

### GÖKÇEADA'NIN (KD EGE DENİZİ) BİVALVIA FAUNASI

#### ÖZET

Gökçeada'nın (KD Ege Denizi) bivalv türlerinin belirlenmesi amacıyla gerçekleştirilen bu çalışmada, 1998 ve 1999 yıllarında derinlikleri 0.5-68 m arasında değişen 37 istasyondan direç ve aletli dalış ile toplanan materyalin değerlendirilmesi sonucunda toplam 65 tür belirlenmiştir. Eldeki literatür bilgilerine göre bu türlerden 6 tanesinin [*Modiolula phaseolina* (Philippi, 1844), *Flexopecten glaber* (Linnaeus, 1758), *Kellia suborbicularis* (Montagu, 1803), *Acanthocardia aculeata* (Linnaeus, 1758), *Gari costulata* (Turton, 1822),

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SERHAT ALBAYRAK

*Coralliophaga lithophagella* (Lamarck, 1819)] Türkiye'nin Ege Denizi kıyıları faunası için yeni kayıt oldukları görülmüştür.

**Anahtar Sözcükler:** Bilvalvia, Mollusca, Ege Denizi

## INTRODUCTION

The number of studies about bivalves of Turkish seas is quite few. This group has been mentioned usually in general faunistic works and a list of species from these studies was given by Öztürk and Çevik (2000).

The Bivalvia fauna of Turkish coast of the Aegean Sea is represented by 135 species whereas there are 264 species from Greek coasts (Zenetos, 1996). This considerable difference between species numbers of two sides of the Aegean Sea reveals the necessity of new studies about bivalves of Turkish coast of the Aegean Sea.

This study was carried out to determine the Bivalvia fauna of Imbros Island of which there are no previous data about bivalves, and to contribute to the knowledge of the Bivalvia fauna of the Aegean Sea coast of Turkey.

## MATERIAL AND METHODS

Material for this study was obtained in 1998 and 1999 from 37 stations between the depths of 0.5-68 m, including different bottom types such as mud, sand, gravel, stone and rock, by dredging and scuba diving (Fig.1). Obtained material was rinsed in wire sieves with a mesh size of 1 mm, bivalve species picked from this material and then fixed and preserved in 5% formalin prepared in sea water. Moreover, depth and substrate of these stations and temperature, salinity, pH and dissolved oxygen (DO) of sea water were determined (Tab.1). For physical and chemical analyses of sea water, a 3 litre water sampler was used, the temperature was measured by thermometer on the water sampler, pH by pH-meter, salinity by Mohr-Knudsen method (Ivanoff, 1972) and dissolved oxygen by Winkler method (Winkler, 1888).

BIVALVIA FAUNA of the IMBROS ISLAND (NE AEGEAN SEA)

After determining the species in laboratory, all material was carried to Muséum National d'Histoire Naturelle, Paris and Istituto di Scienze Ambientali Marine, Genoa for comparing with their collections and making confirmations. Sabelli *et al.* (1990) and CLEMAM database were followed in classification of species.

Minimum and maximum values of the ecological parameter for each species were given. But, ecological features of a station in which only empty shells of a relevant species obtained were not taken into account. Moreover, shell length, height and width of each species were measured by means of a caliper compass and minimum and maximum values of each size were given.

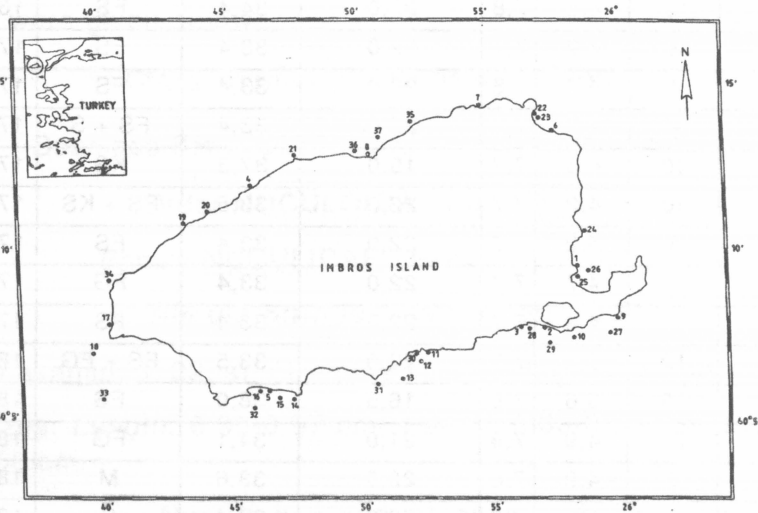


Figure 1: Map of Imbros Island showing sampling stations

**Table 1:** Data about stations

DO: Dissolved oxygen, CG: Coarse gravel, CS: Coarse sand, FG: Fine gravel, FS: Fine sand, KS: Coral+Serpulid, M: Mud, R: Rock, S: Stone

Station Number	Depth (m)	DO (mg/l)	pH	Temperature (°C)	Salinity (psu)	Substrate	Date
1	0,5	5,0	8,0	25,0	27,1	R + CG	09.06.1998
2	0,5	8,2	8,0	25,0	29,6	FS	09.06.1998
3	0,5	8,1	8,0	25,0	29,6	R + FS	09.06.1998
4	0,5	7,8	8,1	24,5	27,5	R	10.06.1998
5	0,5	5,6	8,1	26,0	22,9	R + CG	10.06.1998
6	0,5	8,3	8,0	24,5	29,7	R + CS	11.06.1998
7	0,5	8,6	8,0	25,0	28,9	R	11.06.1998
8	13	6,8	7,8	23,0	34,4	FS	16.09.1998
9	3	4,9	7,7	22,0	33,4	FS	17.09.1998
10	4	4,7	7,6	22,0	33,4	FS	17.09.1998
11	4	4,7	7,7	22,0	33,4	FS + S	17.09.1998
12	30	4,3	7,7	19,0	37,3	KS	17.09.1998
13	30	4,2	7,7	22,0	33,5	FS + KS	17.09.1998
14	3	5,2	7,7	22,0	33,4	FS	17.09.1998
15	15	4,7	7,7	22,0	33,4	FG	17.09.1998
16	3	4,9	7,7	22,0	33,4	FS	17.09.1998
17	10	5,9	7,6	22,0	33,5	FS + FG	18.09.1998
18	68	5,6	7,6	16,5	38,0	FS	18.09.1998
19	25	4,9	7,8	21,0	34,1	FG	18.09.1998
20	9	4,9	7,8	22,0	33,6	M	18.09.1998
21	9	5,9	7,6	22,0	33,4	S	18.09.1998
22	5	3,0	7,5	22,0	33,4	M	19.09.1998
23	10	2,9	7,5	22,0	33,4	FS + M	19.09.1998
24	11	4,6	8,0	19,0	38,3	FG	25.05.1999
25	3	6,5	7,7	19,0	37,4	FS	25.05.1999
26	13	6,5	8,0	18,0	38,4	FS	25.05.1999
27	16	4,3	7,9	18,0	38,4	FS	25.05.1999
28	2	4,1	8,0	19,0	33,9	R + FS	25.05.1999



BIVALVIA FAUNA of the IMBROS ISLAND (NE AEGEAN SEA)

29	18	3,7	7,7	18,0	38,7	FS + KS	25.05.1999
30	4	3,3	7,9	19,0	34,8	FS + KS	26.05.1999
31	32	3,6	7,9	15,0	36,1	FS	26.05.1999
32	25	2,3	7,9	18,0	38,4	CS + S	26.05.1999
33	41	4,4	7,8	16,0	38,3	FS	26.05.1999
34	28	5,5	7,9	15,0	36,6	FS	26.05.1999
35	18	3,2	7,9	18,0	38,0	FS	26.05.1999
36	17	3,1	7,8	19,0	38,3	FS	26.05.1999
37	52	2,5	7,8	15,0	38,5	FS + KS	26.05.1999

## RESULTS

As a result of this study, totally 65 species belonging to 55 genera and 29 families were determined and data about these species were given below.

Class **BIVALVIA** Linnaeus, 1758

Subclass **PROTOBRANCHIA** Pelseneer, 1889

Order **NUCULOIDA** Dall, 1889

Family **NUCULIDAE** Gray J.E., 1824

***Nucula nitidosa*** Winckworth, 1930

Material examined: 22. st. (1 empty shell), 23. st. (1 empty shell).

Shell sizes: *Length*: 0.90-0.97 cm; *Height*: 0.80-0.94 cm; *Breadth*: 0.42-0.50 cm.

***Nucula nucleus*** (Linnaeus, 1758)

Material examined: 22. st. (3 living specimens).

Shell sizes: *Length*: 0.50-0.74 cm; *Height*: 0.41-0.61 cm; *Breadth*: 0.25-0.38 cm.

Ecological features: *Depth*: 5 m; *DO*: 3 mg/l; *pH*: 7.5; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Mud.

Subclass **PTEROMORPHIA** Beurlen, 1944Order **ARCOIDA** St.oliczka, 1871Family **ARCIDAE** Lamarck, 1818***Arca noae*** Linnaeus, 1758

Material examined: 3. st. (3 living specimens), 5. st. (1 living specimen), 28. st. (1 living specimen).

Shell sizes: *Length*: 3.50-5.70 cm; *Height*: 1.71-2.60 cm; *Breadth*: 1.82-2.96 cm.

Ecological features: *Depth*: 0.5-2 m; *DO*: 4.1-8.1 mg/l; *pH*: 8-8.1; *Temperature*: 19-26 °C; *Salinity*: 22.9-33.9 psu; *Substrate*: Rock.

***Arca tetragona*** Poli, 1795

Material examined: 32. st. (1 living specimen).

Shell sizes: *Length*: 0.57 cm; *Height*: 0.30 cm; *Breadth*: 0.22 cm.

Ecological features: *Depth*: 25 m; *DO*: 2.3 mg/l; *pH*: 7.9; *Temperature*: 18 °C; *Salinity*: 38.4 psu; *Substrate*: Stone.

***Barbatia barbata*** (Linnaeus, 1758)

Material examined: 3. st. (2 living specimens), 28. st. (3 living specimens).

Shell sizes: *Length*: 1.31-5.78 cm; *Height*: 0.68-2.92 cm; *Breadth*: 0.49-2.15 cm.

Ecological features: *Depth*: 0.5-2 m; *DO*: 4.1-8.1 mg/l; *pH*: 8; *Temperature*: 19-25 °C; *Salinity*: 29.6-33.9 psu; *Substrate*: Rock

Family **NOETIDAE** Stewart, 1930***Striarca lactea*** (Linnaeus, 1758)

Material examined: 5. st. (3 living specimens), 19. st. (2 living specimens), 26. st. (2 empty shells), 29. st. (4 living specimens), 30. st. (3 living specimens), 32. st. (1 living specimen).

BIVALVIA FAUNA of the IMBROS ISLAND (NE AEGEAN SEA)

Shell sizes: *Length:* 0.45-0.80 cm; *Height:* 0.28-0.52 cm; *Breadth:* 0.24-0.46 cm.

Ecological features: *Depth:* 0.5-25 m; *DO:* 2.3-5.6 mg/l; *pH:* 7.7-8.1; *Temperature:* 18-26 °C; *Salinity:* 22.9-38.7 psu; *Substrate:* Fine and coarse gravel, stone, empty shells, in holes of coral+serpulid.

Family GLYCYMERIDIDAE Newton, 1922

***Glycymeris glycymeris*** (Linnaeus, 1758)

Material examined: 2. st. (2 empty shells), 3. st. (2 empty shells), 32. st. (1 empty shell), 33. st. (1 empty shell), 36. st. (3 empty shells).

Shell sizes: *Length:* 3.28-5.20 cm; *Height:* 3.17-5.22 cm; *Breadth:* 1.80-2.75 cm.

Order **MYTILOIDA** Férussac, 1822

Family MYTILIDAE Rafinesque, 1815

***Mytilus galloprovincialis*** Lamarck, 1819

Material examined: 1. st. (5 living specimens), 4. st. (4 living specimens), 6. st. (3 living specimens), 7. st. (5 living specimens), 28. st. (3 living specimens).

Shell sizes: *Length:* 2.30-4.71 cm; *Height:* 1.30-3.04 cm; *Breadth:* 0.91-1.84 cm.

Ecological features: *Depth:* 0.5-2 m; *DO:* 4.1-8.6 mg/l; *pH:* 8-8.1; *Temperature:* 19-25 °C; *Salinity:* 27.1-33.9 psu; *Substrate:* Coarse gravel, rock, coarse sand.

***Musculus costulatus*** (Risso, 1826)

Material examined: 13. st. (2 living specimens), 27. st. (2 living specimens), 29. st. (1 living specimen), 30. st. (4 living specimens).

Shell sizes: *Length:* 0.37-0.55 cm; *Height:* 0.23-0.35 cm; *Breadth:* 0.16-0.26 cm.

Ecological features: *Depth:* 4-30 m; *DO:* 3.3-4.3 mg/l; *pH:* 7.7-7.9; *Temperature:* 18-22 °C; *Salinity:* 33.5-38.7 psu; *Substrate:* In holes of and between fine threads over coral+serpulid, on leaves of *Posidonia oceanica* (Linnaeus).

***Lithophaga lithophaga*** (Linnaeus, 1758)

Material examined: 32. st. (1 empty shell).

Shell sizes: *Length:* 1.60 cm; *Height:* 0.52 cm; *Breadth:* 0.40 cm.

***Modiolus barbatus*** (Linnaeus, 1758)

Material examined: 33. st. (3 empty shells).

Shell sizes: *Length:* 1.15-1.73 cm; *Height:* 0.75-1.22 cm; *Breadth:* 0.48-0.69 cm.

***Modiolula phaseolina*** (Philippi, 1844)

Material examined: 13. st. (5 living specimens).

Shell sizes: *Length:* 0.75-1.22 cm; *Height:* 0.50-0.76 cm; *Breadth:* 0.33-0.64 cm.

Ecological features: *Depth:* 30 m; *DO:* 4.2 mg/l; *pH:* 7.7; *Temperature:* 22 °C *Salinity:* 33.5 psu; *Substrate:* In *Crambe crambe* (Schmidt, 1862) settled on holdfast of *Posidonia oceanica*.

Family PINNIDAE Leach, 1819

***Pinna nobilis*** Linnaeus, 1758

Material examined: 25. st. (1 living specimen).

Shell sizes: *Length:* 40.62 cm; *Height:* 16.11 cm; *Breadth:* 6.32 cm.

Ecological features: *Depth:* 3 m; *DO:* 6.5 mg/l; *pH:* 7.7; *Temperature:* 19 °C; *Salinity:* 37.4 psu; *Substrate:* Fine sand.

BIVALVIA FAUNA of the IMBROS ISLAND (NE AEGEAN SEA)

Order **PTERIOIDA** Newell, 1965

Family **PTERIIDAE** Gray J.E., 1847

***Pteria hirundo*** (Linnaeus, 1758)

Material examined: From trawls of fisherman at the north of the Island.

Shell sizes: *Length*: 5.43 cm; *Height*: 3.84 cm; *Breadth*: 1.10 cm.

Family **PECTINIDAE** Rafinesque, 1815

***Pecten jacobus*** (Linnaeus, 1758)

Material examined: 23. st. (1 living specimen), 36. st. (1 empty shell).

Shell sizes: *Length*: 1.77-2.20 cm; *Height*: 1.71-1.98 cm; *Breadth*: 0.30-0.39 cm.

Ecological features: *Depth*: 10 m; *DO*: 2.9 mg/l; *pH*: 7.5; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Fine sand+mud.

***Aequipecten opercularis*** (Linnaeus, 1758)

Material examined: 18. st. (3 empty shells), 31. st. (3 living specimens), 33. st. (2 living specimens), 34. st. (1 living specimen), 37. st. (1 living specimen).

Shell sizes: *Length*: 0.60-1.72 cm; *Height*: 0.68-1.79 cm; *Breadth*: 0.21-0.59 cm.

Ecological features: *Depth*: 28-52 m; *DO*: 2.5-5.5 mg/l; *pH*: 7.8-7.9; *Temperature*: 15-16 °C; *Salinity*: 36.1-38.5 psu; *Substrate*: Fine sand.

***Pseudamussium clavatum*** (Poli, 1795)

Material examined: 18. st. (1 empty shell).

Shell sizes: *Length*: 2.11 cm; *Height*: 2.34 cm; *Breadth*: 0.71 cm.



***Chlamys varia*** (Linnaeus, 1758)

Material examined: 23. st. (1 living specimen).

Shell sizes: *Length*: 0.90 cm; *Height*: 1.14 cm; *Breadth*: 0.38 cm.

Ecological features: *Depth*: 10 m; *DO*: 2.9 mg/l; *pH*: 7.5; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Fine sand+mud.

***Chlamys pestifelis*** (Linnaeus, 1758)

Material examined: 36. st. (1 empty shell).

Shell sizes: *Length*: 5.41 cm; *Height*: 6.19 cm; *Breadth*: 1.51 cm.

***Flexopecten glaber*** (Linnaeus, 1758)

Material examined: 23. st. (3 empty shells).

Shell sizes: *Length*: 1.91-2.18 cm; *Height*: 2.05-2.29 cm; *Breadth*: 0.63-0.72 cm.

Family ANOMIIDAE Rafinesque, 1815

***Anomia ehippium*** Linnaeus, 1758

Material examined: 5. st. (1 empty shell), 12. st. (2 living specimens), 31. st. (1 living specimen), 33. st. (1 living specimen).

Shell sizes: *Length*: 0.43-1.53 cm; *Height*: 0.32-1.02 cm; *Breadth*: 0.11-0.49 cm.

Ecological features: *Depth*: 30-41 m; *DO*: 3.6-4.4 mg/l; *pH*: 7.7-7.9; *Temperature*: 15-19 °C; *Salinity*: 36.1-38.3 psu; *Substrate*: On coral+serpulid, on leaves of *Posidonia oceanica*.

Family LIMIDAE Rafinesque, 1815

***Limaria tuberculata*** (Olivi, 1792)

Material examined: 2. st. (1 empty shell), 12. st. (1 living specimen), 30. st. (1 living specimen).

BIVALVIA FAUNA of the IMBROS ISLAND (NE AEGEAN SEA)

Shell sizes: *Length*: 0.51-1.11 cm; *Height*: 0.76-1.58 cm; *Breadth*: 0.27-0.60 cm.

Ecological features: *Depth*: 4-30 m; *DO*: 3.3-4.3 mg/l; *pH*: 7.7-7.9; *Temperature*: 19 °C; *Salinity*: 34.8-37.3 psu; *Substrate*: In holes of coral+serpulid.

***Limaria hians*** (Gmelin, 1791)

Material examined: 32. st. (2 living specimens).

Shell sizes: *Length*: 0.83-0.89 cm; *Height*: 1.43-1.50 cm; *Breadth*: 0.50-0.54 cm.

Ecological features: *Depth*: 25 m; *DO*: 2.3 mg/l; *pH*: 7.9; *Temperature*: 18 °C; *Salinity*: 38.4 psu; *Substrate*: In holes of stone.

Order **OSTREOIDA** Férussac, 1822

Family **OSTREIDAE** Rafinesque, 1815

***Ostrea edulis*** Linnaeus, 1758

Material examined: 23. st. (2 empty shells).

Shell sizes: *Length*: 5.52-7.45 cm; *Height*: 6.89-9.23 cm; *Breadth*: 2.48-4.50 cm.

Subclass **HETERODONTA** Neumayr, 1884

Order **VENEROIDA** Adams H.&A., 1857

Family **LUCINIDAE** Fleming, 1828

***Loripes lacteus*** (Linnaeus, 1758)

Material examined: 10. st. (2 living specimens), 23. st. (1 empty shell).

Shell sizes: *Length*: 1.53-2.31 cm; *Height*: 1.40-2.23 cm; *Breadth*: 0.78-1.14 cm.

Ecological features: *Depth*: 4 m; *DO*: 4.7 mg/l; *pH*: 7.6; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Fine sand.

***Anodontia fragilis*** (Philippi, 1836)

Material examined: 23. st. (3 empty shells).

Shell sizes: *Length*: 0.82-1.10 cm; *Height*: 0.74-0.98 cm; *Breadth*: 0.55-0.72 cm.

***Myrtea spinifera*** (Montagu, 1803)

Material examined: 18. st. (2 empty shells), 31. st. (3 empty shells).

Shell sizes: *Length*: 0.62-1.16 cm; *Height*: 0.53-1.00 cm; *Breadth*: 0.23-0.42 cm.

Family CHAMIDAE Blainville, 1825

***Pseudochama gryphina*** (Lamarck, 1819)

Material examined: 11. st. (2 living specimens).

Shell sizes: *Length*: 1.80-2.52 cm; *Height*: 1.68-2.50 cm; *Breadth*: 1.03-2.38 cm.

Ecological features: *Depth*: 4 m; *DO*: 4.7 mg/l; *pH*: 7.7; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Stone.

Family KELLIIDAE Forbes & Hanley, 1848

***Kellia suborbicularis*** (Montagu, 1803)

Material examined: 13. st. (2 living specimens), 32. st. (1 living specimen), 37. st. (1 living specimen).

Shell sizes: *Length*: 0.18-0.37 cm; *Height*: 0.14-0.29 cm; *Breadth*: 0.09-0.18 cm.

Ecological features: *Depth*: 25-52 m; *DO*: 2.3-4.2 mg/l; *pH*: 7.7-7.9; *Temperature*: 15-22 °C; *Salinity*: 33.5-38.5 psu; *Substrate*: Between holdfast of *Posidonia oceanica* and *Cryptosula pallasiana* (Moll., 1803) settled on holdfasts of phanerogam, in crevices of stone, in holes of coral+serpulid.

Family CARDITIDAE Fleming, 1828

***Venericardia antiquata*** (Linnaeus, 1758)

Material examined: 26. st. (3 empty shells), 29. st. (2 empty shells).

Shell sizes: *Length*: 1.06-1.86 cm; *Height*: 0.99-1.75 cm; *Breadth*: 0.73-1.31 cm.

Family CARDIIDAE Lamarck, 1809

***Acanthocardia aculeata*** (Linnaeus, 1758)

Material examined: 23. st. (1 empty shell).

Shell sizes: *Length*: 3.71 cm; *Height*: 3.70 cm; *Breadth*: 2.76 cm.

***Acanthocardia paucicostata*** (Sowerby G.B.II, 1834)

Material examined: 22. st. (1 living specimen).

Shell sizes: *Length*: 2.15 cm; *Height*: 2.11 cm; *Breadth*: 1.71 cm.

Ecological features: *Depth*: 5 m; *DO*: 3 mg/l; *pH*: 7.5; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Mud.

***Acanthocardia tuberculata*** (Linnaeus, 1758)

Material examined: 2. st. (3 empty shells), 3. st. (2 living specimens), 5. st. (1 empty shell), 8. st. (2 living specimens), 10. st. (1 living specimen), 21. st. (1 living specimen), 22. st. (1 living specimen), 25. st. (1 living specimen), 35. st. (2 living specimens), 36. st. (1 living specimen).

Shell sizes: *Length*: 0.90-3.91 cm; *Height*: 0.91-4.01 cm; *Breadth*: 0.71-2.96 cm.

Ecological features: *Depth*: 0.5-18 m; *DO*: 3-8.1 mg/l; *pH*: 7.5-8; *Temperature*: 18-25 °C; *Salinity*: 29.6-38.3 psu; *Substrate*: Fine sand, mud, stone.

***Parvicardium exiguum*** (Gmelin, 1791)

Material examined: 22. st. (2 living specimens), 23. st. (1 living specimen).

Shell sizes: *Length*: 0.55-0.90 cm; *Height*: 0.51-0.85 cm; *Breadth*: 0.38-0.65 cm.

Ecological features: *Depth*: 5-10 m; *DO*: 2.9-3 mg/l; *pH*: 7.5; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Mud, fine sand+mud.

***Plagiocardium papillosum*** (Poli, 1795)

Material examined: 19. st. (5 living specimens), 22. st. (5 living specimens), 23. st. (1 living specimen), 35. st. (1 living specimen), 36. st. (1 empty shell).

Shell sizes: *Length*: 0.62-1.20 cm; *Height*: 0.61-1.15 cm; *Breadth*: 0.41-0.81 cm.

Ecological features: *Depth*: 5-25 m; *DO*: 2.9-4.9 mg/l; *pH*: 7.5-7.9; *Temperature*: 18-22 °C; *Salinity*: 33.4-38 psu; *Substrate*: Fine sand, mud, fine sand+mud, fine gravel.

***Laevicardium crassum*** (Gmelin, 1791)

Material examined: 15. st. (1 living specimen), 26. st. (1 empty shell), 31. st. (1 living specimen), 34. st. (1 living specimen), 36. st. (2 living specimens), 37. st. (1 empty shell).

Shell sizes: *Length*: 1.21-2.65 cm; *Height*: 1.26-2.91 cm; *Breadth*: 0.71-1.64 cm.

Ecological features: *Depth*: 15-32 m; *DO*: 3.1-5.5 mg/l; *pH*: 7.7-7.9; *Temperature*: 15-22 °C; *Salinity*: 33.4-38.3 psu; *Substrate*: Fine sand, fine gravel.

***Cerastoderma glaucum*** (Poiret, 1789)

Material examined: 2. st. (4 empty shells), 8. st. (2 empty shells).



BIVALVIA FAUNA of the IMBROS ISLAND (NE AEGEAN SEA)

Shell sizes: *Length*: 0.75-2.25 cm; *Height*: 0.70-2.11 cm; *Breadth*: 0.52-1.55 cm.

Family MACTRIDAE Lamarck, 1809

***Macra stultorum*** (Linnaeus, 1758)

Material examined: 16. st. (1 living specimen), 33. st. (2 empty shells).

Shell sizes: *Length*: 2.65-3.41 cm; *Height*: 2.01-2.55 cm; *Breadth*: 1.36-1.75 cm.

Ecological features: *Depth*: 3 m; *DO*: 4.9 mg/l; *pH*: 7.7; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Fine sand.

***Spisula subtruncata*** (da Costa, 1778)

Material examined: 10. st. (2 living specimens), 11. st. (2 living specimens), 15. st. (2 living specimens), 17. st. (3 living specimens), 22. st. (4 living specimens), 23. st. (1 living specimen), 27. st. (3 living specimens), 30. st. (2 living specimens), 34. st. (1 living specimen), 35. st. (1 living specimen).

Shell sizes: *Length*: 0.22-1.40 cm; *Height*: 0.17-1.08 cm; *Breadth*: 0.13-0.72 cm.

Ecological features: *Depth*: 4-28 m; *DO*: 2.9-5.9 mg/l; *pH*: 7.5-7.9; *Temperature*: 15-22 °C; *Salinity*: 33.4-38.4 psu; *Substrate*: Fine sand, fine sand+mud, mud, fine gravel, under arms of *Astropecten* sp.

Family MESODESMATIDAE Gray J.E., 1839

***Donacilla cornea*** (Poli, 1795)

Material examined: 2. st. (5 empty shells).

Shell sizes: *Length*: 1.95-2.29 cm; *Height*: 1.11-1.33 cm; *Breadth*: 0.60-0.84 cm.

Ecological features: *Depth*: 5-8 m; *DO*: 2.4 mg/l; *pH*: 7.5; *Temperature*: 22 °C; *Salinity*: 34-38 psu; *Substrate*: Fine sand, mud, fine gravel.

Family PHARELLIDAE Tryon, 1884

***Ensis ensis*** (Linnaeus, 1758)

Material examined: 33. st. (1 empty shell).

Shell sizes: *Length*: 4.38 cm; *Height*: 0.60 cm; *Breadth*: 0.31 cm.

Family TELLINIDAE Blainville, 1814

***Tellina nitida*** Poli, 1791

Material examined: 22. st. (3 living specimens).

Shell sizes: *Length*: 0.88-0.95 cm; *Height*: 0.47-0.51 cm; *Breadth*: 0.21-0.23 cm.

Ecological features: *Depth*: 5 m; *DO*: 3 mg/l; *pH*: 7.5; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Mud.

***Tellina distorta*** Poli, 1791

Material examined: 22. st. (3 empty shells).

Shell sizes: *Length*: 1.32-1.69 cm; *Height*: 0.67-0.96 cm; *Breadth*: 0.34-0.53 cm.

Family DONACIDAE Fleming, 1828

***Donax variegatus*** Gmelin, 1791

Material examined: 15. st. (3 living specimens), 16. st. (2 living specimens), 20. st. (2 living specimens), 24. st. (2 living specimens), 29. st. (1 living specimen), 32. st. (1 living specimen).

Shell sizes: *Length*: 1.48-3.30 cm; *Height*: 0.69-1.50 cm; *Breadth*: 0.38-0.91 cm.

Ecological features: *Depth*: 3-25 m; *DO*: 2.3-4.9 mg/l; *pH*: 7.7-8; *Temperature*: 18-22 °C; *Salinity*: 33.4-38.7 psu; *Substrate*: Fine and coarse sand, mud, fine gravel.

***Donax trunculus*** Linnaeus, 1758

Material examined: 2. st. (1 empty shell), 3. st. (2 living specimens), 30. st. (1 living specimen).

Shell sizes: *Length*: 2.73-3.35 cm; *Height*: 1.59-1.89 cm; *Breadth*: 0.89-1.12 cm.

Ecological features: *Depth*: 0.5-4 m; *DO*: 3.3-8.1 mg/l; *pH*: 7.9-8; *Temperature*: 19-25 °C; *Salinity*: 29.6-34.8 psu; *Substrate*: Fine sand.

Family PSAMMOBIIDAE Fleming, 1828

***Gari fervensis*** (Gmelin, 1791)

Material examined: 34. st. (1 empty shell), 35. st. (1 living specimen).

Shell sizes: *Length*: 2.68-3.18 cm; *Height*: 1.34-1.49 cm; *Breadth*: 0.61-0.71 cm.

Ecological features: *Depth*: 18 m; *DO*: 3.2 mg/l; *pH*: 7.9; *Temperature*: 18 °C; *Salinity*: 38 psu; *Substrate*: Fine sand.

***Gari costulata*** (Turton, 1822)

Material examined: 15. st. (1 empty shell), 34. st. (3 empty shells).

Shell sizes: *Length*: 1.10-2.10 cm; *Height*: 0.51-1.10 cm; *Breadth*: 0.25-0.59 cm.

Family SEMELIDAE Stoliczka, 1870

***Abra alba*** (Wood W., 1802)

Material examined: 20. st. (1 living specimen), 22. st. (2 living specimens).

Shell sizes: *Length*: 0.69-1.00 cm; *Height*: 0.47-0.61 cm; *Breadth*: 0.23-0.38 cm.

Ecological features: *Depth*: 5-9 m; *DO*: 3-4.9 mg/l; *pH*: 7.5-7.8; *Temperature*: 22 °C; *Salinity*: 33.4-33.6 psu; *Substrate*: Mud.

SERHAT ALBAYRAK

Family SOLECURTIDAE d'Orbigny, 1846

***Azorinus chamasolen*** (da Costa, 1778)

Material examined: 23. st. (1 empty shell).

Shell sizes: *Length*: 2.92 cm; *Height*: 1.40 cm; *Breadth*: 0.80 cm.

Family TRAPEZIIDAE Lamy, 1920

***Coralliophaga lithophagella*** (Lamarck, 1819)

Material examined: 32. st. (6 empty shells).

Shell sizes: *Length*: 1.15-2.08 cm; *Height*: 0.70-1.14 cm; *Breadth*: 0.41-0.90 cm.

Family VENERIDAE Rafinesque, 1815

***Venus verrucosa*** Linnaeus, 1758

Material examined: 3. st. (2 living specimens), 19. st. (3 living specimens), 22. st. (2 living specimens), 25. st. (1 living specimen), 28. st. (2 living specimens), 29. st. (1 empty shell), 34. st. (2 empty shells), 36. st. (1 empty shell).

Shell sizes: *Length*: 1.06-3.93 cm; *Height*: 0.90-3.63 cm; *Breadth*: 0.58-2.37 cm.

Ecological features: *Depth*: 0.5-25 m; *DO*: 3-8.1 mg/l; *pH*: 7.5-8; *Temperature*: 19-25 °C; *Salinity*: 29.6-37.4 psu; *Substrate*: Fine sand, mud, fine gravel.

***Chamelea gallina*** (Linnaeus, 1758)

Material examined: 2. st. (2 empty shells), 5. st. (3 empty shells), 8. st. (2 living specimens), 9. st. (1 living specimen), 10. st. (2 living specimens), 11. st. (3 living specimens), 22. st. (3 living specimens), 25. st. (2 living specimens), 35. st. (1 empty shell).

Shell sizes: *Length*: 0.83-2.66 cm; *Height*: 0.73-2.35 cm; *Breadth*: 0.41-1.33 cm.

Ecological features: *Depth*: 3-13 m; *DO*: 3-6.8 mg/l; *pH*: 7.5-7.8; *Temperature*: 19-23 °C; *Salinity*: 33.4-37.4 psu; *Substrate*: Fine sand, mud.

***Clausinella fasciata*** (da Costa, 1778)

Material examined: 15. st. (1 living specimen), 34. st. (2 living specimens), 36. st. (2 living specimens).

Shell sizes: *Length*: 1.02-1.92 cm; *Height*: 0.99-1.70 cm; *Breadth*: 0.61-1.10 cm.

Ecological features: *Depth*: 15-28 m; *DO*: 3.1-5.5 mg/l; *pH*: 7.7-7.9; *Temperature*: 15-22 °C; *Salinity*: 33.4-38.3 psu; *Substrate*: Fine sand, fine gravel.

***Timoclea ovata*** (Pennant, 1777)

Material examined: 18. st. (4 empty shells).

Shell sizes: *Length*: 0.52-0.90 cm; *Height*: 0.44-0.75 cm; *Breadth*: 0.27-0.46 cm.

***Gouldia minima*** (Montagu, 1803)

Material examined: 14. st. (2 living specimens), 15. st. (2 living specimens), 22. st. (3 living specimens).

Shell sizes: *Length*: 0.67-1.01 cm; *Height*: 0.60-0.90 cm; *Breadth*: 0.28-0.53 cm.

Ecological features: *Depth*: 3-15 m; *DO*: 3-5.2 mg/l; *pH*: 7.5-7.7; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Fine sand, mud, fine gravel.

***Dosinia exoleta*** (Linnaeus, 1758)

Material examined: 26. st. (1 empty shell).

Shell sizes: *Length*: 2.19 cm; *Height*: 2.04 cm; *Breadth*: 0.92 cm.



***Pitar rudis*** (Poli, 1795)

Material examined: 22. st. (2 living specimens), 23. st. (3 living specimens), 34. st. (1 empty shell).

Shell sizes: *Length*: 0.84-1.92 cm; *Height*: 0.78-1.68 cm; *Breadth*: 0.48-1.20 cm.

Ecological features: *Depth*: 5-10 m; *DO*: 2.9-3 mg/l; *pH*: 7.5; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Mud, fine sand+mud.

***Callista chione*** (Linnaeus, 1758)

Material examined: 5. st. (2 empty shells), 34. st. (3 empty shells), 36. st. (4 empty shells).

Shell sizes: *Length*: 2.73-6.37 cm; *Height*: 2.17-5.42 cm; *Breadth*: 1.21-3.42 cm.

***Ruditapes decussatus*** (Linnaeus, 1758)

Material examined: 5. st. (1 living specimen).

Shell sizes: *Length*: 2.56 cm; *Height*: 2.00 cm; *Breadth*: 1.30 cm.

Ecological features: *Depth*: 0.5 m; *DO*: 5.6 mg/l; *pH*: 8.1; *Temperature*: 26 °C; *Salinity*: 22.9 psu; *Substrate*: Coarse gravel.

***Irus irus*** (Linnaeus, 1758)

Material examined: 32. st. (2 empty shells).

Shell sizes: *Length*: 1.00-1.51 cm; *Height*: 0.71-1.03 cm; *Breadth*: 0.48-0.85 cm.

***Paphia rhomboides*** (Pennant, 1777)

Material examined: 22. st. (3 living specimens).

Shell sizes: *Length*: 0.77-1.66 cm; *Height*: 0.53-1.14 cm; *Breadth*: 0.31-0.80 cm.

Ecological features: *Depth*: 5 m; *DO*: 3 mg/l; *pH*: 7.5; *Temperature*: 22 °C; *Salinity*: 33.4 psu; *Substrate*: Mud.

Order **MYOIDA** Stoliczka, 1870

Family **CORBULIDAE** Lamarck, 1818

**Corbula gibba** (Olivi, 1792)

Material examined: 8. st. (2 living specimens), 12. st. (2 living specimens), 23. st. (1 living specimen), 24. st. (2 living specimens), 27. st. (1 living specimen).

Shell sizes: *Length*: 0.23-0.92 cm; *Height*: 0.17-0.78 cm; *Breadth*: 0.12-0.50 cm.

Ecological features: *Depth*: 10-30 m; *DO*: 2.9-6.8 mg/l; *pH*: 7.5-8; *Temperature*: 18-23 °C; *Salinity*: 33.4-38.4 psu; *Substrate*: Fine sand, fine sand+mud, fine gravel, in holes of coral+serpulid, under arms of *Astropecten* sp.

Family **GASTROCHAENIDAE** Gray J.E., 1840

**Gastrochaena dubia** (Pennant, 1777)

Material examined: 30. st. (3 living specimens), 37. st. (2 living specimens).

Shell sizes: *Length*: 0.71-0.88 cm; *Height*: 0.36-0.45 cm; *Breadth*: 0.34-0.40 cm.

Ecological features: *Depth*: 4-52 m; *DO*: 2.5-3.3 mg/l; *pH*: 7.8-7.9; *Temperature*: 15-19 °C; *Salinity*: 34.8-38.5 psu; *Substrate*: In holes of coral+serpulid.

Family **HIATELLIDAE** Gray J.E., 1824

**Hiatella arctica** (Linnaeus, 1767)

Material examined: 1. st. (2 living specimens), 12. st. (4 living specimens), 30. st. (6 living specimens), 36. st. (3 living specimens).

Shell sizes: *Length*: 0.39-0.86 cm; *Height*: 0.20-0.42 cm; *Breadth*: 0.16-0.38 cm.

Ecological features: *Depth:* 0.5-30 m; *DO:* 3.1-5 mg/l; *pH:* 7.7-8; *Temperature:* 19-25 °C; *Salinity:* 27.1-38.3 psu; *Substrate:* In crevices of rock, in holes of coral+serpulid, between fine threads over *Aporrhais pespelecani* (Linnaeus, 1758).

***Hiatella rugosa*** (Linnaeus, 1767)

Material examined: 1. st. (5 living specimens), 4. st. (7 living specimens), 5. st. (6 living specimens), 6. st. (5 living specimens), 13. st. (11 living specimens), 21. st. (3 living specimens), 23. st. (2 living specimens), 29. st. (3 living specimens), 30. st. (6 living specimens), 32. st. (2 living specimens).

Shell sizes: *Length:* 0.30-1.65 cm; *Height:* 0.17-0.75 cm; *Breadth:* 0.13-0.58 cm.

Ecological features: *Depth:* 0.5-30 m; *DO:* 2.3-8.3 mg/l; *pH:* 7.5-8.1; *Temperature:* 18-26 °C; *Salinity:* 22.9-38.7 psu; *Substrate:* In holes of and between fine threads over coral+serpulid, in rock crevices, in *Crambe crambe* settled on holdfast of *Posidonia oceanica*, in *Ircinia* sp.

## CONCLUSIONS

As a result of this study, totally 65 species were determined and six of them (*Modiolula phaseolina*, *Flexopecten glaber*, *Kellia suborbicularis*, *Acanthocardia aculeata*, *Gari costulata*, *Coralliophaga lithophagella*) were seen as new records for the Aegean Sea coasts of Turkey. *Cerastoderma glaucum* and *Hiatella rugosa* were not indicated from the Aegean Sea in the list of Öztürk and Çevik (2000). But, *C. glaucum* was reported by Önen and Yaramaz (1993) and *H. rugosa* by Kocataş (1978) from the Aegean Sea. Therefore, these two species from this study were not accepted as new records.

Most bivalves are present in shallower waters although some species live in deeper waters (Cox, 1969). The same situation was observed in Imbros Island bivalves. Ranges of 0.5-9 m and 10-19 m were the reachest depths in regard to species

#### BIVALVIA FAUNA of the IMBROS ISLAND (NE AEGEAN SEA)

number with 29 and 18 species respectively. Ranges of 20-29 m followed them with twelve species, 30-39 m with ten, 40-49 m with two and 50-59 m with three species. Any living specimen couldn't be obtained from deeper than 60 m.

Bivalves can adapt various substrate types, but a great majority of them prefers soft bottoms (Barnes, 1987). About 65% of the species from Imbros Island were encountered in soft substrate whereas others in relation to hard substrate or living organisms.

As a result, the number of species known from the Aegean Sea was increased to 141 with the addition of new recorded species and some ecological features of these 65 species were given. However, it is obvious that this number will be largely increased by new studies in either unexplored bathymetric zones or geographical areas in the Aegean Sea.

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## REFERENCES

- BARNES, R.D.: Invertebrate zoology. Fifth edition. Saunders College Publishing, New York, (1987), 893.
- CLEMAM : Check List of European Marine Mollusca. <http://www.mnhn.fr/base/malaco.html>.
- COX, L.R.: General features of Bivalvia. In: Moore, R.C. (Ed.). Treatise on invertebrate paleontology. Part N, Vol. 1, Mollusca 6, Bivalvia. Geological Society of America, Boulder & University of Kansas, Lawrence, (1969), N2-N129.
- IVANOFF, A.: Introduction al'océanographie. Tome I. Librairie Vuibert, Paris, (1972), 208.
- KOCATAŞ, A.: İzmir Körfezi kayalık sahillerinin bentik formları üzerinde kalitatif ve kantitatif araştırmalar. Ege Üniv. Fen Fak. Monografiler Serisi, 12 (1978), 1-93.
- ÖNEN, M. and YARAMAZ, Ö.: Süyo (Homa) Dalyanı'nda fiziko-kimyasal parametreler ile makrobentik faunanın mevsimsel ve yıllara bağlı değişimleri. Eğitiminin 10. Yılında Su Ürünleri Sempozyumu, İzmir, 12-14 (1993), 413-428.
- ÖZTÜRK, B. and ÇEVİK, C.: Molluscs fauna of Turkish seas. Club Conchylia Informationen, 32 (1/3) (2000), 27-53.
- SABELLİ, B., GIANNUZZI-SAVELLİ R. and BEDULLİ D.: Annotated check-list of Mediterranean marine mollusks. Libreria Naturalistica Bolognese, Bologna, 1 (1990), 348.
- WINKLER, L.W.: The determination of dissolved oxygen in water. Berlin. Deut. Chem. Ges., 21 (1888), 2843-2855.
- ZENETOS, A.: Fauna Graeciae. VII. The marine Bivalvia (Mollusca) of Greece. National Centre for Marine Research, Athens, (1996), 319.