Acta Adriat., 31 (1/2): 293—300 (1990)

YU ISSN: 0001-5113
AADRAY

UDC 593.9 (262)
Original scientific paper

ON THE ECHINODERM FAUNA OF THE GERAS GULF (LESVOS ISLAND, GREECE)

FAUNA EHINODERMA ZALJEVA GERAS (OTOK LESVOS, GRČKA)

A. Pancucci and A. Zenetos

National Centre for Marine Research, Athens, Greece

Twenty nine species of Echinodermata were identified from benthic samples collected during 1986—1987 in the Geras gulf, 12 of which are new for the area. Of these, *Amphiura cherbonnieri* and *Neocucumis marioni* are first records for the eastern Mediterranean while *Psammechinus microtuberculatus* and *Echinocardium flavescens* are reported for the second time in greek waters.

INTRODUCTION

The gulf of Geras is situated on the south of Lesvos island. It is the smaller and relatively shallower (maximum depth up to 20 m) of the two natural semi-enclosed gulfs of the island, with a surface of 46 km^2. It communicates with the open sea (Aegean sea) with a narrow strait 6.5 Km long.

A preliminary study of the macrozoobenthos of the Geras gulf was conducted during the summer of 1983, in order to assess the possible effects of the industrial effluents of a tannery (Diapoulis and Bogdanos, 1983).

From the above and some more papers on the benthic comunities of the offshore waters surrounding the island (Kisselova 1961, 1963; Jacquotte, 1962; Koukouras and Sinis, 1981), 17 species of Echinodermata are known so far.

In the present work, part of the on going project »Ecological study of the Geras gulf«, an attempt is made to record the echinoderm fauna of the area. Some data on the ecology, spatial distribution and zoogeography of the species are also given.

MATERIALS AND METHODS

Benthic samples were collected on a seasonal basis (March, June, September and December 1986 and March, July 1987) from 9 stations (Fig. 1). Three samples were taken at each station with a Ponar grab (0.05 m^2).

The depth and sediment type of the substratum for all stations is given in Table 1. The specimens identified here are those bigger than 1 mm. Some big specimens of Echinodermata were collected by scuba diving in the shallow waters of the same sites.

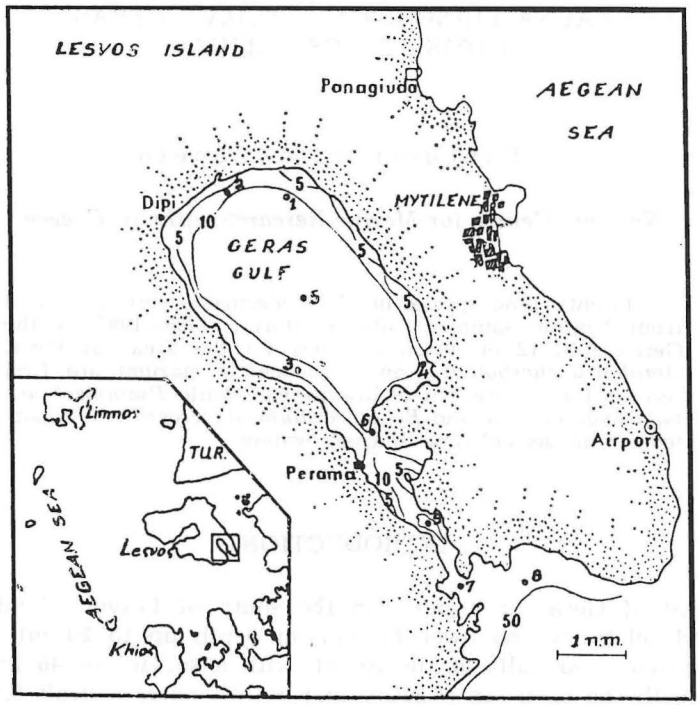

Fig. 1. Location of sampling sites in the Geras Gulf

Table 1. Depth and sediment type

Station	Depth (m)	Sediment type
1	11	Coralligenous
2	6.5	Sandy mud
3	6	Sandy mud
4	6	*Posidonia* + gravel
5	18	Mud
6	8.5	*Cladocora caespitosa* + mud
7	21	Shelly gravel
8	40	*Posidonia* bed
9	20	Sandy mud + detritus

RESULTS AND DISCUSSION

The Echinodermata species recorded in the gulf ranged between 4—7% of the total benthic fauna of the area. A total of 29 species were found (Table 2) of which 10 Ophiuroidea, 3 Asteroidea, 9 Echinoidea and 7 Holothuroidea.

The species *Paracentrotus lividus, Arbacia lixula, Echinaster sepositus* and *Sphaerechinus granularis* were frequently observed by scuba diving.

The overall number of Echinodermata species of Lesvos island rises up to 33, with the addition of 4 species *(Antedon mediterranea, Holothuria helleri, Holothuria polii* and *Havelockia inermis)* already reported round the island (Kisseleva 1961, 1963; Jacquotte, 1962 Koukouras and Sinis, 1981; Diapoulis and Bogdanos, 1984) but not found by us.

Table 2. List of species in taxonomic order

OPHIUROIDEA

Amphipholis squamata (Delle Chiaje, 1828)
Amphiura cherbonnieri Guille, 1972
Amphiura chiajei Forbes, 1843
Ampliura filiformis (O. F. Muller, 1776)
Amphiura mediterranea Lyman, 1882
Ophiopsila aranea Forbes, 1843
Ophiothrix fragilis (Abildgaard, 1789)
Ophiura albida Forbes, 1839
Ophiura grubei Heller, 1863
Ophiura ophiura Lamarck, 1816

ASTEROIDEA

Asterina gibbosa (Pennant, 1777)
Astropecten aranciacus (Linnee, 1758)
Echinaster sepositus (Retzius, 1783)

ECHINOIDEA

Arbacia lixula (Linnee, 1758)
Echinocardium cordatum (Pennant, 1777)
Echinocardium flavescens (O. F. Muller, 1776)
Echinocyamus pusillus (O. F. Muller, 1776)
Genocidaris maculata A. Agassiz, 1869
Paracentrotus lividus (Lamarck, 1816)
Psammechinus microtuberculatus (Blainville, 1825)
Schizaster canaliferus (Lamarck), 1816)
Spaerechinus granularis (Lamarck, 1816)

HOLOTHURIOIDEA

Holothuria (Thymisycia) impatiens (Forskal, 1775)
Holothuria tubulosa Gmelin, 1778
Labidoplax digitata (Montagu, 1815)
Leptopentacta elongata (Duben-Koren, 1844)
Leptopentacta tergestina (M. Sars, 1857)
Neocucumis marioni (Marenzeller, 1878)
Ocnus planci (Brandt, 1835)

In table 3 is given the zoogeographical distribution of the recorded species for the eastern Mediterranean (Aegean Sea, Bosphoros and Marmara, Turkey coasts, Levantine Sea), as well as for the Adriatic Sea and Ionian Sea. A separate column refers to the species previously known around Lesvos island. As seen in the table, sixteen of our species are new for the area (* in Table 3).

Regarding the zoogeographical distribution and ecology of the species, special attention must be given to the following:

Amphiura cherbonnieri: First record for the eastern Mediterranean. The species has first been described by Guille (1972) from the coasts of Catalonia at 115 m, on coarse sand. Tortonese (1977) refers it at various localities of W. Italy (Tyrrhenian Sea), between 12 and 130 m depth, in detritus, muddy sand and *Posidonia*. It is also listed in the Adriatic Sea fauna (Zavodnik, 1979).

Table 3. Zoogeographical distribution of the Lesvos Echinodermata
(* = First record for the examined area)

Species	prev. Les. island	Aegean Sea	Bosph. & Marmara	Turkey coasts	Levant. Sea	Ionian Sea	Adriatic Sea
*Amphipholis squamata**	—	+	+	—	+	+	+
*Amphiura cherbonnieri**	—	—	—	—	—	—	+
A. chiajei	+	+	+	—	+	+	+
A. filiformis	+	+	+	—	+	+	+
A. mediterranea	+	+	—	—	+	+	+
*Ophiopsila aranea**	—	+	+	—	+	+	+
Ophiothrix fragilis	+	+	+	+	+	+	+
Ophiura albida	+	+	+	—	+	+	+
*O. grubei**	—	+	+	—	+	+	+
O. ophiura	+	+	+	—	+	+	+
*Asterina gibbosa**	—	+	+	+	+	+	+
*Astropecten aranciacus**	—	+	+	+	+	+	+
*Echinaster sepositus**	—	+	+	+	+	+	+
*Arbacia lixula**	—	+	—	+	—	+	+
*Echinocardium cordatum**	—	+	—	+	+	+	+
*E. flavescens**	—	+	—	—	—	—	+
Echinocyamus pusillus	+	+	+	—	+	+	+
Genocidaris maculata	+	+	+	—	+	+	+
*Paracentrotus lividus**	—	+	+	+	+	+	+
*Psammechinus microtuberculatus**	—	—	+	—	—	+	+
*Schizaster canaliferus**	—	+	+	—	+	+	+
Sphaerechinus granularis	+	+	+	+	—	+	+
Holothuria (Thymiosycia) impatiens	+	+	—	—	+	+	+
Hol. tubulosa	—	+	+	+	—	+	+
Labidoplax digitata	+	+	+	+	+	+	+
*Leptopentacta elongata**	—	+	+	+	+	+	+
L. tergestina	+	+	+	+	+	+	+
*Neocucumis marioni**	—	—	—	—	—	—	+
*Ocnus planci**	—	+	+	+	—	—	+

In accordance with the above, the species was widely distributed in the Gerasgulf, over a variety of substrates (mud, gravel, *Posidonia* meadows) at depths 6—21 m. Its maximum abundance occurred in July 1987 at station 3 (sandy mud, 6 m) with 303 specimens/m^2 and in December, at station 5 (mud, 18 m) with 244 specimens/m^2.

Neocucumis marioni: First record for the eastern Mediterranean. In the western Mediterranean it has been reported by:

— Cherbonnier and Guille (1967) in Banyuls at depths 27—30 m on mud, sandy mud, sand and gravel.

— Lopez-Ibor *et al.* (1982) in Capo du Palos (Spain) at 18 m in *Posidonia* meadows.

— Vatova (1949) refers it in the Adriatic, on mud at the depth of 34 m, while Tortonese (1965) put its bathymetric distribution between 25 and 100 m on muddy substrates, detritus and *Posidonia* meadows.

In the Geras gulf the species had a restricted distribution (stations 5 and 9), between 18 and 20 m depth, on mud, sandy mud and detritus.

Psammechinus microtuberculatus: First record for the Aegean Sea. A common species for the western Mediterranean, has often been recorded in the Adriatic (Vatova, 1949; Tortonese, 1961; Zavodnik 1972. 1977, 1979; Vidović-Matvejev, 1978). Its bathymetric distribution ranges from 1 to 100 m and its biotope from algae and detritus at shallow waters to sandy detritic bottoms in deeper settlements of algae and seaweeds. Kaspiris and Tortonese (1982) found it up to 220 m deep, on mud in Kephalonia (W. Greece). In the eastern Mediterranean the species is known from the seas of Bosphorus and Marmara (Tortonese and Demir, 1960), as well as from the south and north coasts of Cyprus (Demetropoulos and Hadjichristophorou, 1976).

In the Geras gulf a specimen was found at Station 6, in March 1986 at 8.5 m of depth, on mud and *Cladocora caespitosa* and a second one at Station 4 in March 1987.

Echinocardium flavescens: This is the second reference of the species in the Greek waters, the first being that of Pérès and Picard (1958) at coastal detritic bottoms, 56 m deep, in Syros island.

Not a common species in the Mediterranean, has scattered references of few representatives. Cherbonnier (1956) has found it in Tunisia in mud at 10 m depth. Tortonese (1965) records it from sandy and muddy substrates, coralligenous or detritic bottoms between 5 and 360 m. Gilat (1969) has found a few specimens in the Ligurian Sea at depths 35 to 55 m on sandy mud, sandy gravel and *Posidonia* detritus. Zavodnik (1972, 1979) lists it in the Adriatic Sea fauna.

In the Geras gulf one sole specimen was collected at Station 8, at 40 m depth, where there is an extensive *Posidonia* meadow.

No trend was observed as far as the seasonal distribution of the species is concerned. The areal distribution of all species (except those collected by scuba diving) is given in Table 4. Indications on their abundance are given in abbreviated form.

It is clear from the above table that the poorest in number of species is station 5 (in the centre of the gulf, biotope of VTC biocenosis (terrigenous mud), while stations 4 and 6, subjected to the influence of bottom currents, are the richest ones with 13 species each.

Generally an increase in number of species can be seen from the inner part of the gulf towards the open sea. On the contrary, the highest densities are observed in the inner part.

At station 5, *Amphiura chiajei* and *A. cherbonnieri* reached densities up to 511 and 244 ind/m^2 respectively in December, while at station 3 *A. chiajei* reached densities of 592 ind/m^2 in June 1986 and 355 ind/m^2 in December and *A. cherbonnieri* 303 ind/m^2 in July 1987.

Table 4. Distribution of echinoderm species in Geras gulf *r = rare* (1—9 specim.) *f = frequent* (10—50 specim.) *a = abundant* (< 50 specim.)

Stations / SPECIES	1	2	3	4	5	6	7	8	9
Amphipholis squamata	r	—	r	r	r	r	r	r	r
Amphiura cherbonnieri	f	r	a	r	f	r	r	—	r
Amphiura chiajei	f	f	a	r	a	f	f	r	f
Amphiura filiformis	—	r	—	—	—	—	f	r	r
Amphiura mediterranea	r	r	—	r	—	r	—	—	—
Ophiopsila aranea	—	—	—	—	—	—	r	r	—
Ophiothrix fragilis	—	—	—	r	r	r	r	r	r
Ophiura albida	—	—	r	r	—	—	—	r	—
Ophiura grubei	—	—	—	r	—	—	—	—	—
Ophiura ophiura	—	r	—	—	—	—	—	—	r
Asterina gibbosa	—	—	—	r	—	—	—	r	r
Astropecten aranciacus	r	—	—	—	—	—	—	—	—
Echinocardium cordatum	—	r	r	—	—	—	—	—	—
Echinocardium flavescens	—	—	—	—	—	—	—	r	—
Echinocyamus pusillus	—	—	—	—	—	r	r	f	—
Genocidaris maculata	—	—	—	r	—	r	—	r	r
Paracentrotus lividus	—	—	—	r	—	r	—	—	—
Psammechinus microtuberculatus	—	—	—	r	—	r	—	—	—
Schizaster canaliferus	—	—	—	—	—	—	—	r	—
Holothuria (Thymiosycia) impatiens	—	—	—	—	—	r	—	—	—
Holothuria tubulosa	—	—	r	—	—	—	—	—	—
Labidoplax digitata	—	r	—	—	—	—	—	—	—
Leptopentacta elongata	r	r	r	r	r	r	—	—	r
Leptopentacta tergestina	—	—	r	—	—	r	—	—	—
Neocucumis marioni	—	—	—	—	r	—	—	—	r
Ocnus planci	r	r	—	f	—	r	r	—	—
Number of species	7	9	8	13	6	13	8	11	10

ACKNOWLEDGEMENTS

The authors would like to thank Dr A. Guille, of the »Museum National d'Histoire Naturelle«, Paris, for his critical reading and useful suggestions on the manuscript.

REFERENCES

Cherbonnier, G. 1956. Les echinodermes de Tunisia. Bull. Stat. Ocean. Salammbò, 53; 1—23.

Cherbonnier, G. et A. Guille. 1967. Complément a la faune des Echinodermes de la mer de Banyuls. Vie et Milieu, Ser. B, 18 (2—13): 317—330.

Demetropoulos, A. et Hadjichristophorou 1972. Echinodermata of Cyprus. Fisheries Bulletin N. 4, Nicosia, 83 pp.

Diapoulis, A. et C. Bogdanos. 1983. Preliminary study of soft substrate macrozoobenthos and marine flora in the Bay of Gera (Lesvos island, Greece). Thalassographica, 6: 127—139.

Gilat, E. 1969. Study of an Ecosystem in the Coastal Waters of the Ligurian Sea. III. Macrobenthic Communities. Bull. Inst. Ocean. Monaco, 69 (1396): 4—76.

Guille, A. 1972. Ophiures nouvelles ou inconnues de Méditerranée: *A. cherbonnieri* sp. nov. et *A. securigera* (Duben et Koren). Bull. Mus. Nat. Hist. Nat. Paris, Ser. 3, 81: 925—932.

Jacquotte, R. 1962. Etude des fonds de maerl de Méditerranée. Rec. Trav. St. Mar. Endoume, Bull. 26 (41): 141—235.

Kaspiris, P. et E. Tortonese. 1982. Echinoderms from the Western Seas of Greece. Thalassographica, 2 (5): 27—32.

Kisseleva, M. 1961. Repartition qualitative et quantitative du benthos dans le région des Dardanelles en Mer Egée. Trav. Sev. Biol. St., 14: 135—136 (en russe).

Kisseleva, M. 1963. La distribution du Benthos qualitative et quantitative dans la Mer Egée. Trav. Sev. Biol. St., 16: 192—200 (en russe).

Koukouras, A. et A. Sinis. 1981. Benthic fauna of the North Aegean Sea. II. Crinoidea and Holothurioidea (Echinodermata). Vie et Milieu, 31. (3—4): 271—281.

Lopez-Ibor, A., C. Galan et J. Templado. 1982. Echinodermes du Capo du Palos (Murcia, Espagne). Biol. Ecol. Médit., IX (2): 3—18.

Peres, J. M. et J. Picard. 1958. Recherches sur les peuplements benthiques de la Méditerranée Nord-Orientale. Ann. Inst. Ocean. Paris, 34: 213—291.

Tortonese, E. 1961. Echinodermi di Taranto (Mar Ionio). Thal. Jonica, IV: 191—194.

Tortonese, E. 1965. Fauna d'Italia. Edizioni Calderini, Bologna, 422 pp.

Tortonese, E. 1977. Recenti acquisizioni e rettifiche intorno ai Crinoidi, Ofiuroidi ed Echinoidi del Mediterraneo, con particolare riguardo alla Fauna italiana. Atti Soc. ital. Sci. nat. Mus. civ. St. Nat., Milano, 118 (3—4): 333—352.

Tortonese, E. et M. Demir. 1960. The Echinoderm fauna of Marmara and the Bosphorus. Hidrob. Instan., S. B. V (1—2): 1—16.

Vatova, A. 1949. La fauna bentonica dell' Alto e Medio Adriatico. Nova Thalassia, 1 (3): 1—110.

Vidovic-Matvejev, A. 1978. Catalogue of the Adriatic Echinoderms. Acta Adriatica, XVII (15): 1—24.

Zavodnik, D. 1972. Peculiarities of geographical distribution of Adriatic Echinoderms. Thal. Jugoslavica, 8 (2): 321—330.

Zavodnik, D. 1977. Echinodermata of the Island Vir (Adriatic Sea). Biosist., 3 (1): 69—78.

Zavodnik, D. 1979. Cruises of the Research Vessel »Vila Velebita« in the Kvarner Region of the Adriatic Sea. XX. Echinodermata. Thal. Jugosl., 15 (3/4): 289—312.

Accepted: September 8, 1989

A. Pancucci, A. Zenetos
Echinoderm fauna of the Geras Gulf
Acta Adriat., 31 (1/2): 293—300

FAUNA EHINODERMA ZALJEVA GERAS (OTOK LESVOS, GRČKA)

A. Pancucci and A. Zenetos

Nacionalni centar za istraživanje mora, Atena, Grčka

KRATKI SADRŽAJ

Identificirano je dvadesetdevet vrsta Echinodermata u bentoskim uzorcima sakupljenim u zaljevu Geras tijekom 1986—1987. Od identificiranih vrsta 16 je novih za ovo područje, dok su vrste *Amphiura cherbonnieri* i *Neocucumis marioni* po prvi put zabilježeni u Sredozemlju a *Echinocardium flavescens* tek drugi put u grčkim vodama.