

## MARINE FAUNA OF MLJET NATIONAL PARK (ADRIATIC SEA, CROATIA). 5. MOLLUSCA: BIVALVIA

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A 130 bivalve species from 38 families were recorded in the Mljet National Park during research carried out from 1995 to 2002. *In situ* observations and collections were realised by skin and SCUBA diving at 63 sites, to a maximum depth of 58 m. At 21 stations bivalves were collected by Van Veen grab, at six stations by trammel bottom sets and at one station outside the borders of the National Park by a commercial bottom trawl. For each species, the general distribution, depth range, habitat, ecological data and significant remarks are presented. Records published previously were reviewed and a bivalve check-list for the Mljet National Park with a total of 146 species belonging to 39 families was generated. Listed species account for about 70% of bivalves noted in the Adriatic Sea. Sixty-one species were recorded for the first time in the Mljet Island area. One juvenile individual of an Indo-Pacific species *Semipallium coruscans coruscans* (Hinds, 1845) was recorded for the first time in the Mediterranean.

Some species rarely noted for the Adriatic Sea, and also rarely recorded at the stations surveyed were *Nuculana pella*, *Palliolum striatum*, *Pseudamussium sulcatum*, *Limatula gwyni*, *Thyasira granulosa*, *Astarte sulcata*, *Venus casina*, *Globivenus effosa*, *Clausinella fasciata*, *Lajonkairia lajonkairii*, *Mysia undata*, *Thracia villosiuscula*, *Cardiomya costellata*, *Ennucula aegeensis*, *Barbatia clathrata*, and *Galeomma turtoni*.

**Key words:** Bivalvia, Mljet, marine fauna, Adriatic Sea

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U Nacionalnom parku Mljet utvrđeno je tijekom istraživanja provedenog od 1995. do 2002. godine 130 vrsta školjkaša iz 38 porodica. Na 63 obalne postaje školjkaši su bilježeni i sakupljeni metodom autonomnog ronjenja, do dubine od 58 m. Na 21 postaji se uzorkovalo pomoću grabila Van Veen, na jednoj postaji s pridnom kočom, a na šest lokaliteta su školjkaši izvađeni iz ribarskih mreža poponica. Za svaku vrstu se navode podaci o njejoj lokalnoj rasprostranjenosti, dubini, staništu, ekološkim značajkama i značajnijim opažanjima. Izrađena je lista školjkaša za područje Nacionalnog parka Mljet sa 146 vrsta iz 39 porodica u kojoj su obuhvaćeni i prethodni literaturni podaci. Navedene vrste predstavljaju oko 70% školjkaša zabilježenih u Jadranskom moru. 61 vrsta

nađenih školjkaša je prvi puta zabilježena za područje otoka Mljeta. Jedna indopacifička vrsta *Semipallium coruscans coruscans* (Hinds, 1845) nađena je po prvi puta u Sredozemnom moru.

Nađene su i vrste koje su rijetko zabilježene i u Jadranskom moru. To su: *Nuculana pella*, *Palliolium striatum*, *Pseudamussium sulcatum*, *Limatula gwyni*, *Thyasira granulosa*, *Astarte sulcata*, *Venus casina*, *Globivenus effosa*, *Clausinella fasciata*, *Lajonkairia lajonkairii*, *Mysia undata*, *Thracia villosiuscula*, *Cardiomya costellata*, *Ennucula aegeensis*, *Barbatia clathrata* i *Galeomma turtoni*.

**Ključne riječi:** Bivalvia, Mljet, morska fauna, Jadransko more

## INTRODUCTION

Mljet Island is situated in the eastern part of the southern Adriatic, surrounded by oligotrophic waters and exposed to the direct influence of the Ionian Sea current (ZORE-ARMANDA *et al.*, 1991). The westernmost part of the island was in 1960 proclaimed a national park. It occupies an area of 53.75 km<sup>2</sup> of protected land and surrounding sea. The national park marine environments extend 500 m from the coast-line and alongside scattered islets and rocks. The most interesting features of the marine environment are two seawater lakes named Malo Jezero and Veliko Jezero (Small and Great Lake) formed in karstic depressions in the post-glacial period (JURAČIĆ *et al.*, 1995; BENOVIĆ *et al.*, 2000). The lakes are connected to the open sea through a 2.5 m deep and 10 m wide strait and cover an area of 1.7 km<sup>2</sup> (Veliko Jezero 1.45 km<sup>2</sup> and Malo Jezero 0.25 km<sup>2</sup>). The maximum depth of Veliko Jezero is 46 m and of Malo Jezero 29 m. The lakes are distinguished by special environmental conditions (BENOVIĆ & ONOFRI, 1995; BENOVIĆ *et al.*, 2000). A more detailed environmental background of the lake area was provided by BOGNAR & CURIĆ (1995), JURAČIĆ *et al.* (1995), and OREPIĆ *et al.* (1997). A short review of geological, hydrographical and sedimentological surveys in the area is given in the paper by ZAVODNIK (2003).

Even though the area has been legally protected for 45 years, few reports on bivalves from the area have been published until recently. Investigations mostly concerned the bivalves in the lakes, while the bivalve fauna of the surrounding sea was poorly known. The scarce data about marine bivalves were reported during the previous benthos surveys in the Mljet Island waters. In 1894 Brusina visited Mljet Island in the course of the Margita expedition but no data on bivalve molluscs from the Mljet Island area were noted (ILIJANIĆ & STOŠIĆ (1972). In 1936, at two stations situated 8 Nm from Cape Goli on Mljet Island, VATOVA (1949) recorded facies of *Nucula sulcata*, of the community of muddy bottoms of the open central Adriatic Sea named by GAMULIN-BRIDA (1974) »*Nephraps norvegicus-Thenea muricata*«. During the RV Hvar marine benthos expedition in the eastern Adriatic carried out in 1948 and 1949, at station Nr. 123 located 6 nm south-west of Mljet Island the bivalve species *Neopycnodonte cochlear* (Poli, 1795) was collected at a depth of 127 m from a clayish deposit (KARLOVAC, 1959).

The first data on bivalves from the »lakes« area were provided in the 1950s, when research of the macrobenthos in the Veliko Jezero inlet was undertaken by the Institute for Oceanography and Fishery, Split. In a short note by VIDOVIĆ (1955),

information on the *Corbula gibba* and *Pecten* and *Cardium* species was provided. In the period 1951–1955 MOROVIĆ (1958) studied the growth of *Ostrea edulis* in the context of experiments into artificial fertilisation of marine lakes in order to increase their productivity.

Recently more data on marine bivalves from the lakes area were provided during studies of benthic communities. In his thesis DRAGANOVIĆ (1980) recorded 30 bivalve species in Malo Jezero, Veliko Jezero, and at one station located at the southern coast of Mljet Island. OREPIĆ *et al.* (1997) quoted 51 bivalves for the marine lakes area. PEHARDA (2000) and PEHARDA *et al.* (2002a) studied the spatial distribution of bivalves in Malo Jezero: 38 and 31 species, respectively, were recorded. During the study of Malo Jezero and Veliko Jezero thanatocoenoses RADIĆ (2000) listed 37 bivalve species. In Veliko Jezero KRUŽIĆ (2001) studied a large »reef-like« structure of the colonial coral *Cladocora caespitosa* with associated flora and fauna, and noted 18 bivalve species.

Information on selected bivalve species in the study area were also provided by ONOFRI & ONOFRI (1993), ONOFRI & MARGUŠ (1995), BELAMARIĆ *et al.* (1995), ANDRIĆ (1999), PEHARDA *et al.* (2002b), ŠILETIĆ & PEHARDA (2003), and ŠILETIĆ (2004).

The present paper deals with data on bivalve fauna in Mljet National Park, obtained from the research of benthic communities carried out by the THAIS Society between 1995 and 1998, from bivalve sampling by the author in 2000–2002, and with data reviewed from papers published previously. The purpose of this paper was to compile a Mljet National Park bivalve inventory, as a base for future bivalve research in the area.

## MATERIAL AND METHODS

The research performed between 1995 and 2002 was mostly carried out by SCUBA and skin diving. At 63 sites (MLJ-1 to MLJ-63) *in situ* observations and sampling were carried out along 100 meter-long transect lines perpendicular to the shoreline (Fig. 1). At 21 deep stations (MLJ-101 to MLJ-121) sediment was collected by a Van Veen grab (0.1 m<sup>2</sup>), while in the lakes area sediment was collected by a ZAHTILA hand grab (OREPIĆ *et al.*, 1997; ZAVODNIK, 2003). At 6 stations bivalves were collected from trammel bottom sets (stations MLJ-A, B, C, D, E, F), and at one station of a commercial bottom trawl (station MLJ-K1, outside the national park, located 2 Nm S of Goli Cape). Description of the investigated area and surveyed stations, with information on bottom types, depth, and number of surveys, dominant communities, and sediment volume treated were presented by ZAVODNIK (2003), except for station MLJ-K1. At that station a commercial bottom trawl was towed on a bottom of coastal terrigenous ooze, for an hour at 120 m depth. The underwater camera Nikonos V was also used for taking photos of test squares (approx. 0.5 m<sup>2</sup>) along transects, as well as for environment and macro photos.

Easily recognizable species were noted by divers on plastic slates, while other organisms were collected for laboratory identification. The bivalve species were separated from other taxonomic groups in a field laboratory. The sediment-living

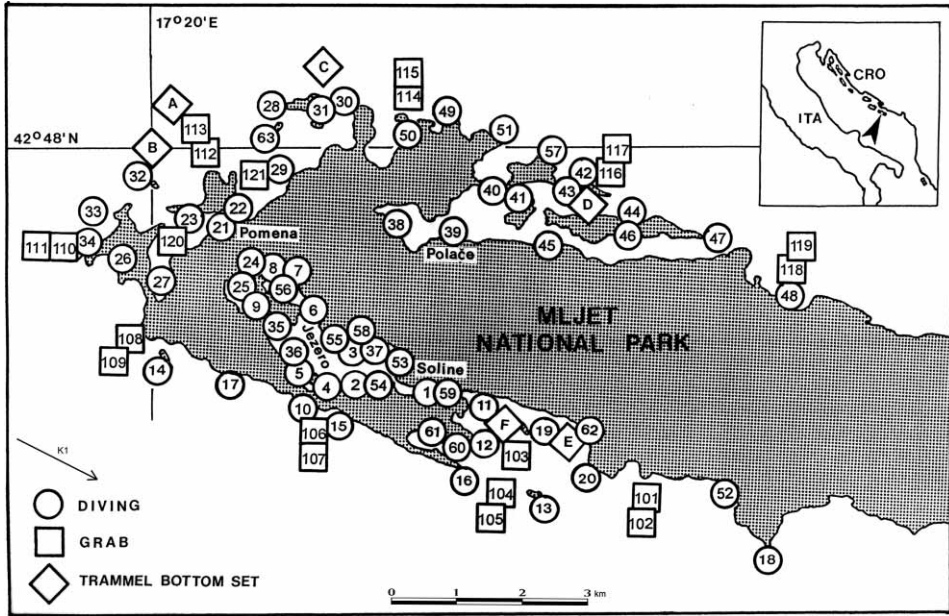


Fig. 1. Research area and surveyed stations.

The list of diving stations (MLJ-1 to MLJ-63), grab stations (MLJ-101 to MLJ-121), trammel bottom net stations (MLJ- A-F) and bottom trawl station (MLJ-K1). A detailed information on stations is provided in OREPIĆ *et al.* (1997) and ZAVODNIK (2003).

Legend: Codes: c – Cove, i – Islet. 1 Solinski kanal, 2 c. Kavalo, 3 Sladingradac Cape, 4 Pračarica, 5 i. Sv. Marija, 6 Babine kuće, 7 Punta od Gočuha, 8 Malo Jezero channel (Mali most), 9 Malo Jezero (Velika Priježba), 10 Gornja Zakamenica, 11 Vratosolina, 12 Srednji rat (Cape), 13 i. Vanji školj, 14 i. Štit, 15 Velika Priveza, 16 Lenga Cape, 17 Zavrti, 18 Tojsti Cape, 19 i. Utrnji Školj, 20 Hljab Cape, 21 c. Pomena, 22 Sikjerica Cape, 23 i. Galijica, 24 c. Pod Mala Poma, 25 Glavica od Mosta (Cape), 26 c. Lastovska, 27 c. Lokva, 28 i. Glavat-W, 29 Debeli rat (Cape), 30 Glavat Cape, 31 i. Glavat-E, 32 i. Crna seka donja, 33 i. Šij, 34 Goli rat (Cape), 35 c. Priježba, 36 Podvrti, 37 Velo Jezero, 38 c. Polače (Gundulišta), 39 c. Polače (Debela Ponta), 40 Rat Lenga (Cape), 41 Tijesno, 42 i. Ovrata-N, 43 i. Ovrata-W, 44 i. Kobrava-N, 45 Tatinica, 46 i. Kobrava-S, 47 i. Kula, 48 c. Vela Tatinica, 49 Zazupci Cape, 50 c. Stupe, 51 Rastupa Cape, 52 c. Procijep, 53 Veli Most-N, 54 Veli Most-W, 55 c. Pristanište, 56 c. Njivice, 57 i. Moračnik-N, 58 c. Vrbovačka, 59 Solinski kanal 2, 60 c. Velike Blace, 61 c. Male Blace, 62 Vranje garme, 63 Crna seka i., 101-121, A 1 Nm W Glavat i., B 500 m N Crna seka donja i., C 500 m NE Glavat i., D S Kobrava i., E Utrnji Školj i.-Vranje Garme, F Srednji rat – Utrnji Školj i., K1.

bivalve species were extracted by sieving sediment through 2 and 1 mm sieves. Some live collected specimens were preserved in 4% formalin or 70% alcohol. Fresh and well preserved shells were rinsed in fresh water, dried and preserved in plastic vials or plastic film-bottles. Length, height and width of the majority of collected shells were measured with vernier callipers. At each species noted in this paper, the

first number denotes shell length expressed in mm (distance between anterior and posterior shell margin), and the second its height (distance between umbo and ventral shell margin). The width, denoted by a third number, was measured in the middle part of paired shells.

For each species the valid zoological name, shell dimensions, finding places, depth range, number of collected individuals, notes on habitat, and significant remarks are given. Data on the ecological significance of the species were quoted from the literature. A list of bivalve species in the Mljet National Park compiled from the results of this study and reviewed papers is presented in Tab. 1.

**Tab. 1.** List of bivalve species in Mljet National Park compiled from this study and reviewed papers.

Species marked with an asterisk (\*) are new for the area studied.

Sources: 1 = VIDOVIĆ (1955), 2 = VULETIĆ (1953), 3 = MOROVIĆ (1958), 4 = DRAGANOVIĆ (1980), 5 = ONOFRI & ONOFRI (1993), 6 = ONOFRI & MARGUŠ (1995), 7 = BELAMARIĆ *et al.* (1995), 8 = OREPIĆ *et al.* (1997), 9 = ANDRIĆ (1999), 10 = PEHARDA (2000), 11 = PEHARDA *et al.* (2002a), 12 = PEHARDA *et al.* (2002b), 13 = ŠILETIĆ & PEHARDA (2003), 14 = ŠILETIĆ (2004), 15 = RADIĆ (2000), 16 = KRUŽIĆ (2001), TS = This study

Species ↓	Locality →	Malo jezero	Veliko jezero	Sea stations
1. <i>Solemya togata</i> (Poli, 1795)				4
2. * <i>Nucula hanleyi</i> Winckworth, 1931				TS
3. * <i>Nucula nitidosa</i> Winckworth, 1930				TS
4. <i>Nucula nucleus</i> (Linnaeus, 1758)		2, 15	8, 15, TS	TS
5. * <i>Nucula sulcata</i> Bronn, 1831			TS	TS
6. <i>Nucula</i> sp.		10, 11		TS
7. * <i>Ennucula aegensis</i> (Forbes, 1844)				TS
8. * <i>Nuculana pella</i> (Linnaeus, 1767)				TS
9. * <i>Nuculana commutata</i> (Philippi, 1844)				TS
10. <i>Arca noae</i> Linnaeus, 1758		2, 4, 8, 10, 11, 12, 13, 15, TS	4, 8, 9, 15, 16, TS	TS
11. * <i>Arca tetragona</i> Poli, 1795				TS
12. <i>Barbatia barbata</i> (Linnaeus, 1758)			4, 8, 15, TS	9, TS
13. * <i>Barbatia clathrata</i> (Defrance, 1816)				TS
14. * <i>Anadara polii</i> (Mayer, 1868)				TS
15. <i>Striarca lactea</i> (Linnaeus, 1758)		8, 10, TS	4, 8, 15, 16, TS	4, TS
16. * <i>Glycymeris bimaculata</i> (Poli, 1795)				TS
17. * <i>Glycymeris glycymeris</i> (Linnaeus, 1758)			16	TS
18. <i>Glycymeris</i> sp.				TS
19. <i>Mytilus galloprovincialis</i> Lamarck, 1819		4, 8, TS	4, TS	4, TS
20. * <i>Mytilaster lineatus</i> (Gmelin, 1791)				TS
21. <i>Mytilaster minimus</i> (Poli, 1795)		15, TS	8, 15, TS	TS
22. <i>Mytilaster</i> sp.		10, 11		
23. <i>Modiolarca subpicta</i> (Cantraine, 1835)		8, TS	8, TS	TS
24. * <i>Musculus costulatus</i> (Risso, 1826)				TS
25. <i>Musculus</i> sp.		8		TS

Species ↓	Locality →	Malo jezero	Veliko jezero	Sea stations
26. <i>Lithophaga lithophaga</i> (Linnaeus, 1758)		4, 8, 10, TS	4, 8, 16, TS	TS
27. <i>Modiolus barbatus</i> (Linnaeus, 1758)		2, 4, 8, 9, 10, 11, 15, TS	4, 8, 15, 16, TS	TS
28. <i>Modiolus modiolus</i> (Linnaeus, 1758)		4		
29. <i>Modiolus adriaticus</i> (Lamarck, 1819)			15	TS
30. <i>Modiolus</i> sp.		11		
31. <i>Pinna nobilis</i> Linnaeus, 1758		8, 9, 10, 12, 13, TS	4, 8, 13, 16, TS	4, 7, TS
32. * <i>Atrina pectinata</i> (Linnaeus, 1767)				TS
33. * <i>Pteria hirundo</i> (Linnaeus, 1758)				TS
34. <i>Pecten jacobaeus</i> (Linnaeus, 1758)		10, TS	4, 5, 6, 8, 9, TS	TS
35. <i>Pecten</i> sp.			1	
36. * <i>Aequipecten opercularis</i> (Linnaeus, 1758)				TS
37. * <i>Lissopecten hyalinus</i> (Poli, 1795)			TS	TS
38. * <i>Palliolium incomparabile</i> (Risso, 1826)				TS
39. * <i>Palliolium striatum</i> (O.F. Müller, 1776)				TS
40. * <i>Pseudamussium clavatum</i> (Poli, 1795)				TS
41. * <i>Pseudamussium sulcatum</i> (O.F. Müller, 1776)				TS
42. <i>Crassadoma multistriata</i> (Poli, 1795)			15, TS	4, TS
43. * <i>Chlamys flexuosa</i> (Poli, 1795)				TS
44. <i>Chlamys glabra</i> (Linnaeus, 1758)		8, 9, 10, 11, 12, TS	4, 8, TS	TS
45. <i>Chlamys pesfelis</i> (Linnaeus, 1758)				7, TS
46. <i>Chlamys varia</i> (Linnaeus, 1758)		4, 8, 9, 10, 11, 13, 15, TS	4, 8, 15, 16, TS	TS
47. <i>Chlamys</i> sp.			15	TS
48. * <i>Semipallium coruscans coruscans</i> (Hinds, 1845)				14 (TS)
49. <i>Spondylus gaederopus</i> Linnaeus, 1758		4	4, 8, TS	4, TS
50. <i>Anomia ephippium</i> Linnaeus, 1758		8, 10, 11, TS	4, 8, 13, 15, 16, TS	TS
51. <i>Anomia</i> sp.		11, TS	8, TS	TS
52. <i>Pododesmus patelliformis</i> (Linnaeus, 1761)		10, TS	TS	TS
53. <i>Lima lima</i> (Linnaeus, 1758)		8	8, 16, TS	9, TS
54. * <i>Limaria hians</i> (Gmelin, 1791)			TS	TS
55. <i>Limaria tuberculata</i> (Olivier, 1792)		TS	16, TS	9, TS
56. <i>Limea loscombi</i> (Sowerby G.B. I, 1824)			4	
57. * <i>Limatula gwyni</i> (Sykes, 1903)				TS
58. <i>Ostrea edulis</i> Linnaeus, 1758		8, 10, 13, TS	3, 4, 8, 13, 15, 16, TS	TS
59. <i>Ostrea</i> sp.			TS	TS
60. * <i>Neopycnodonte cochlear</i> (Poli, 1795)				TS
61. <i>Ctena decussata</i> (O.G. Costa., 1829)			4, 8, 15, TS	TS
62. <i>Loripes lacteus</i> (Linnaeus, 1758)		8, 10, 11, 15, TS	4, TS	TS

Species ↓	Locality →	Malo jezero	Veliko jezero	Sea stations
63. <i>Lucinella divaricata</i> (Linnaeus, 1758)		8, 10, 11, 15, TS	8, 15	TS
64. <i>Anodontia fragilis</i> (Philippi, 1836)		10, 11, TS		TS
65. * <i>Myrtea spinifera</i> (Montagu, 1803)				TS
66. * <i>Thyasira flexuosa</i> (Montagu, 1803)			15	TS
67. * <i>Thyasira granulosa</i> (Monterosato, 1874)				TS
68. * <i>Diplodonta brocchii</i> (Deshayes, 1852)				TS
69. * <i>Diplodonta rotundata</i> (Montagu, 1803)				TS
70. <i>Chama gryphoides</i> Linnaeus, 1758		4, 8, 10, 11, 15, TS	4, 8, 15, 16, TS	TS
71. <i>Chama</i> sp.			8, TS	TS
72. <i>Pseudochama gryphina</i> (Lamarck, 1819)		10, 11, TS	8, 15, TS	7, TS
73. * <i>Galeomma turtoni</i> Sowerby G.B.I in Turton, 1825				TS
74. * <i>Kellia suborbicularis</i> (Montagu, 1803)		15, TS	15, TS	TS
75. * <i>Lasaea rubra</i> (Montagu, 1803)				TS
76. <i>Cardita calyculata</i> (Linnaeus 1758)			8	
77. * <i>Glans aculeata</i> (Poli, 1795)				TS
78. <i>Glans trapezia</i> (Linnaeus, 1767)		10, 11, 15, TS	15, TS	TS
79. * <i>Astarte sulcata</i> (da Costa 1778)				TS
80. <i>Astarte</i> sp.		15		
81. <i>Acanthocardia echinata</i> (Linnaeus, 1758)		15		TS
82. <i>Acanthocardia paucicostata</i> (Sowerby G.B.II, 1841)		2, 4, 8, 10, 11, 15, TS	4, 8, TS	
83. <i>Acanthocardia tuberculata</i> (Linnaeus, 1758)		8	8	TS
84. ? <i>Cardium</i> sp.			1	
85. <i>Parvicardium exiguum</i> (Gmelin, 1791)		2, 4, 8, 10, 11, 15, TS	4, 8, 15, TS	TS
86. <i>Parvicardium minimum</i> (Philippi, 1836)		4		TS
87. <i>Plagiocardium papillosum</i> (Poli, 1795)		10, 11, 15, TS	15, TS	TS
88. <i>Laevicardium crassum</i> (Gmelin, 1791)			8, TS	TS
89. * <i>Laevicardium oblongum</i> (Gmelin, 1791)			TS	TS
90. <i>Laevicardium</i> sp.				TS
91. <i>Cerastoderma edule</i> (Linnaeus, 1758)		2, 4	4	
92. <i>Cerastoderma glaucum</i> (Poiret, 1789)		4, 8, 10, 11, TS		TS
93. <i>Cerastoderma</i> sp.		15, TS		TS
94. <i>Tellina distorta</i> Poli, 1791		2		
95. <i>Tellina donacina</i> Linnaeus, 1758		8, 15, TS	15, TS	TS
96. <i>Tellina planata</i> Linnaeus, 1758		2		
97. <i>Tellina pulchella</i> Lamarck, 1818		8, 15, TS		TS
98. * <i>Tellina serrata</i> Brocchi, 1814				TS
99. <i>Tellina</i> sp.		8, 10, 11, 15	8, 15, 16	TS
100. <i>Arcopagia balaustina</i> (Linnaeus, 1758)			8, TS	TS
101. * <i>Arcopagia crassa</i> (Pennant, 1777)				TS
102. <i>Gastrana fragilis</i> (Linnaeus, 1758)		10, 11	8, TS	TS

Species ↓	Locality →	Malo jezero	Veliko jezero	Sea stations
103. * <i>Gari costulata</i> (Turton, 1822)				TS
104. <i>Gari depressa</i> (Pennant, 1777)			8, TS	TS
105. <i>Gari fervensis</i> (Gmelin, 1791)		10, 11		
106. * <i>Gari</i> sp.				TS
107. <i>Abra alba</i> (W. Wood, 1802)		2, 10, 11		TS
108. * <i>Abra nitida</i> (O.F. Müller, 1776)				TS
109. * <i>Abra prismatica</i> (Montagu, 1808)				TS
110. <i>Abra</i> sp.		8, 15, TS		
111. <i>Azorinus chamasolen</i> (da Costa, 1778)		10, 11, 15, TS	8, TS	TS
112. * <i>Coralliophaga lithophagella</i> (Lamarck, 1819)			16, TS	TS
113. * <i>Glossus humanus</i> (Linnaeus, 1758)				TS
114. * <i>Venus casina</i> Linnaeus, 1758				TS
115. <i>Venus verrucosa</i> Linnaeus, 1758		8, 10, 11, 15, TS	4, 8, 16, TS	4, TS
116. * <i>Globivenus effosa</i> (Philippi, 1836)				TS
117. <i>Chamelea gallina</i> (Linnaeus, 1758)			4, 8	
118. * <i>Clausinella fasciata</i> (da Costa, 1778) (= <i>C. brongniartii</i> Payraudeau, 1826)				TS
119. <i>Timoclea ovata</i> (Pennant, 1777)			4	TS
120. <i>Gouldia minima</i> (Montagu, 1803)		10, 11, 15, TS	8, 15, 16, TS	TS
121. * <i>Dosinia exoleta</i> (Linnaeus, 1758)				TS
122. <i>Pitar rudis</i> (Poli, 1795)		10, 11, 15, TS	8, TS	TS
123. * <i>Callista chione</i> (Linnaeus, 1758)				TS
124. <i>Tapes decussatus</i> (Linnaeus, 1758)		10, 11		TS
125. <i>Irus irus</i> (Linnaeus, 1758)		10		
126. <i>Venerupis aurea</i> (Gmelin, 1791)			4, TS	TS
127. <i>Veneupis rhomboides</i> (Pennant, 1777)		10, 11	8, TS	TS
128. <i>Paphia</i> sp.		8, 15, TS		TS
129. * <i>Venerupis pullastra</i> (Montagu, 1803)			TS	TS
130. <i>Petricola lithophaga</i> (Philippson, 1788)		8, TS		TS
131. * <i>Lajonkairia lajonkairii</i> (Payraudeau, 1826)				TS
132. <i>Mysia undata</i> (Pennant, 1777)		10, 11		TS
133. <i>Corbula gibba</i> (Olivi, 1792)		2, 8, 10, 11, 15, TS	1, 2, 15, TS	TS
134. <i>Gastrochaena dubia</i> (Pennant, 1777)		4, 8, 10, TS	4, 8, 15, 16, TS	7, TS
135. <i>Hiatella arctica</i> (Linnaeus, 1767)		8, TS	TS	TS
136. <i>Hiatella rugosa</i> (Linnaeus, 1767)			8	
137. <i>Hiatella</i> sp.		TS	13, 16, TS	TS
138. <i>Teredo</i> sp.		10	8, TS	
139. * <i>Thracia convexa</i> (Wood W., 1815)				TS
140. * <i>Thracia corbuloides</i> Deshayes, 1830				TS
141. * <i>Thracia papyracea</i> (Poli, 1791)				TS
142. * <i>Thracia villosiuscula</i> (MacGillivray, 1827)				TS
143. <i>Thracia</i> sp.			TS	TS
144. * <i>Cuspidaria cuspidata</i> (Olivi, 1792)				TS
145. * <i>Cuspidaria rostrata</i> (Spengler, 1793)				TS
146. * <i>Cardiomya costellata</i> (Deshayes, 1835)				TS



Species reported herein were identified according to TEBBLE (1966), Nordsieck (1969), PARENZAN (1974, 1976), POUTIERS (1987) and POPPE & GOTO (1993). The species *Semipallium coruscans coruscans* (Hinds, 1845) was identified according to WALLER (1972) and DIJKSTRA & KILBURN (2001). Taxonomic nomenclature based on ERMS (BOUCHET *et al.*, 2001), MARBEF (2006) and CLEMAM (2006) was used. The biocoenological terminology of PÉRÈS & PICARD (1964), PICARD (1965), GAMULIN-BRIDA (1974) and BELLAN-SANTINI (1969) was applied.

## RESULTS

### NUCULIDAE Gray, 1824

#### *Nucula hanleyi* Winckworth, 1931

Stations: MLJ-36, 44, 46, 101, 102, 112, 113, 118, 119.

Depth: 30–87 m.

Material: 1 live individual (8.7/7.8/3.9 mm) and 14 shells (5 paired shells sized 5.4/4.5/?–7.0/5.9/3.3 mm and 9 valves sized 3.9/3.3–13.8/12.0 mm).

Habitat: Collected from sand mixed with broken shells, muddy detrital bottom, sand mixed with *Spongites fruticosus* and *Lithothamnion* debris, and muddy sand mixed with small shells.

Ecological significance: Not defined.

Remarks: Noted in deeper zones of investigated area. The live individual was extracted from sand mixed with *Lithothamnion* debris at station MLJ-113.

#### *Nucula nitidosa* Winckworth, 1930

Stations: MLJ-27, 44, 45, 102.

Depth: 0–10 and 57–83 m.

Material: 5 shells (2 paired shells sized 10.0/7.9/4.8–11.1/8.6/5.5 mm and 3 valves sized 5.4/3.9–11.1/9.9 mm).

Habitat: Collected from sand, coarse sand mixed with shells, and muddy detrital bottom.

Ecological significance: A species of wide ecological distribution indicating environmental instability (PICARD, 1965; ZAVODNIK, 1971).

Remarks: Previously noted in the north and central eastern Adriatic Sea (ZAVODNIK, 1971; HRS-BRENKO & LEGAC, 1991; HRS-BRENKO, 1997).

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

Stations: MLJ-2, 27, 29, 30, 36, 38, 41, 43, 101, 103.

Depth: 5–60 m.

Material: 18 shells (9 paired shells sized 4.3/3.4/2.0–6.7/5.9/3.3 mm, 5 not measured, and 9 valves sized 4.7/3.9–7.4/5.7 mm).

Habitat: Muddy and fine sand in *Posidonia oceanica* meadows, coarse to fine sand mixed with shell litter, and sand mixed with *Lithothamnion* debris.



Ecological significance: Species living on mixed bottom tolerating sandy and muddy fractions. It occurred in the community of fine well-calibrated sand and community of coastal terrigenous ooze (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Common species at all stations noted.

*Nucula sulcata* Bronn, 1831

Stations: MLJ-27, 36, 38, 39, 42, 43, 45, 46, 50, 102, 104–107, 109, 113, 114, 116–119, 121.

Depth: 5–107 m.

Material: 7 live individuals (sized 4.8/4.3/2.4–11.9/10.9/5.6 mm) and 57 shells (17 paired shells sized 1.7/1.5/1.0–10.2/8.8/4.9 mm and 40 valves sized 1.9/1.7–13.8/10.9 mm).

Habitat: Collected from sand mixed with broken shells, muddy detrital bottoms, fine sand overgrown by marine phanerogams, sand mixed with *Lithothamnion* debris, mud, muddy sand mixed with bivalvian, and bryozoan debris.

Ecological significance: Species living only on silty bottom (PICARD, 1965; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997) noted as a facies in the community of muddy bottoms of the open central and northern Adriatic insular zones »*Nephrops norvegicus*-*Thenea muricata*« (GAMULIN-BRIDA, 1974).

Remarks: Live specimens were collected by Van Veen grab at stations MLJ-104, 105, 114, 116 and 119 on sandy sediments mixed with various proportions of ooze, deeper than 82 m. All shells were dark olive-yellow in colour. Many closed shells collected were filled with deposits. In Polače cove, at Debela Ponta (MLJ-39) an empty shell was found in an empty shell of *Pinna nobilis*. At Ovrata islet-W (MLJ-43) shells were collected from fine sand in *Posidonia oceanica* meadow.

*Ennucula aegeensis* (Forbes, 1844)

Stations: MLJ-104, 107, 112, 113, 115, 116, 118, 120.

Depth: 39–104 m.

⇐ Plate 1.

Fig. 2. *Ennucula aegeensis* (length of the upper valves 5.7 mm and lower valves 4.8 mm).  
 Fig. 3. *Barbatia clathrata* (length of the left valve 9 mm, middle 9.3 mm and right 7.8 mm).  
 Fig. 4. *Anadara polii* (length 28.1 mm).  
 Fig. 5. *Palliolium incomparabile* (length of the valves from left to right 12.5 mm, 9 mm, 7 mm, 8 mm and 8.5 mm).  
 Fig. 6. *Palliolium striatum*, left valve (length 10.9 mm).  
 Fig. 7. *Pseudamussium sulcatum*, right valve (length 23 mm).  
 Fig. 8a. *Chlamys glabra* (length 40.1 mm).  
 Fig. 8b. *Chlamys glabra* (length of lower valves 34.9 mm and upper valves 39.4 mm).  
 Fig. 9. *Kellia suborbicularis* (length of left valve 9.2 mm, middle and right 7.6 mm).  
 Fig. 10a. *Coralliophaga lithophagella* (length 15.4 mm).  
 Fig. 10b. *Coralliophaga lithophagella* (length of lower valves 7.6 mm and upper valves 8.8 mm).

- Material:** 5 live individuals (sized 2.0/1.6/0.8–5.9/5.2/3.1 mm) and 13 shells (9 paired shells sized 1.2/1.1/0.7–5.7/4.5/3.1 mm, 2 not measured and 4 valves sized 1.1/1.0–7.5/6.2 mm).
- Habitat:** Sampled from sand, sand mixed with *Lithothamnion* debris, muddy sand, and mud.
- Ecological significance:** Species preferring silty and sandy bottoms with organic detritus (HRS-BRENKO & LEGAC, 1991).
- Remarks:** The species was rarely found only in deeper zones of the area studied. Our smallest live specimen was sampled by Van Veen grab in sand at MLJ-112 station. Collected specimens varied from white to pale yellow and light greenish in colour (Fig. 2).

### NUCULANIDAE Adams H. & A., 1858

#### *Nuculana pella* (Linnaeus, 1767)

- Stations:** MLJ-43, 45, 46, B.
- Depth:** 20–80 m.
- Material:** 4 valves (sized 7.2/4.0–9.9/5.6 mm).
- Habitat:** Collected from fine sand mixed with shells in *Posidonia oceanica* meadows and muddy detritic sediment.
- Ecological significance:** A mixed bottom species indicating unstable environmental conditions (PICARD, 1965; ZAVODNIK, 1971; HRS-BRENKO & LEGAC, 1991) is a characteristic species to the communities of mobile bottoms which mostly occupy the zone between communities of coastal detrital bottom and of coralligenous community (PÉRÈS & PICARD, 1964; GAMULIN-BRIDA, 1974).
- Remarks:** Less common species than *Nuculana commutata* in the area studied and in the Adriatic Sea, respectively (LEGAC & HRS-BRENKO, 1982; HRS-BRENKO & LEGAC, 1991).

#### *Nuculana commutata* (Philippi, 1844)

- Stations:** MLJ-C, B, 102, 104–107, 109, 112, 118, 119, 121.
- Depth:** 60–107 m.
- Material:** 39 shells (16 paired shells sized 2.4/1.5/0.9–9.3/5.5/4.4 mm and 23 valves sized 2.4/1.2–13.5/5.0 mm).
- Habitat:** Extracted from sand, muddy sand with bivalvian shells, and muddy sand rich in bryozoan debris.
- Ecological significance:** Species occurring in mixed sediments (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974).
- Remarks:** Common species in deeper zones of investigated area. At the most, shells were paired, connected together and filled by mud. An abundance of dead individuals with closed shells previously was recorded in the northern Adriatic Sea (HRS-BRENKO & LEGAC, 1991). At MLJ-106 shell was sampled from sandy mud with bryozoan debris. Three juvenile shells (2.4 mm in length) were extracted from muddy

sand mixed with bivalvian shells at MLJ-109, and sandy sediment at MLJ-112 station.

### ARCIDAE Lamarck, 1809

*Arca noae* Linnaeus, 1758

Stations: MLJ-1-9, 11, 14, 16, 17, 20–31, 34–36, 39–51, 53, 54, 57, 58, 60, 61, 112.

Depth: From infralittoral fringe to 70 m of depth.

Material: Many live individuals were noted by divers, but not collected. Some of them were 8–10 cm long. 7 live individuals collected (5 sized 1.6/1.0/0.6–22.3/9.8/9.3 mm, 2 not measured). Also many shells were noted by divers, but only 8 were collected (4 paired shells sized 8.5/4.9/4.3–56.7/27.8/27.0 mm and 4 valves sized 10.7/5.4–72.0/31.5 mm).

Habitat: Noted attached by byssus to rocks covered with algae, on rocks and loose stones in marine phanerogams meadows, on loose stones and various hard substrata in sand mixed with shell litter and muddy sand, on *Pinna nobilis* and other molluscan shells, on rhizomes of *Posidonia oceanica*, and among fragments of *Cladocora caespitosa* colonies.

Ecological significance: A species of wide ecological distribution, preferential for the communities of coastal detrital bottom and of coastal detrital bottom partly mixed with ooze (ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; HRS-BRENKO & LEGAC, 1996).

Remarks: *Arca noae* is one of the most frequently noted species in the area surveyed. It was especially abundant in the northern part of the National Park and in the lakes. Large individuals were noted in Malo Jezero (at MLJ-9, 24 and 25) attached to other bivalve species (*Modiolus barbatus*, *Pseudochama gryphina* and *Chlamys varia*). Well formed *Arca* clusters were laying on the sand mixed with broken shells in *Cymodocea nodosa* meadows and on muddy sand fully covered with shell debris. At Velika Priježba (MLJ-9) and Glavica od mosta (MLJ-25) individuals were noted as epibionts on live *Pinna nobilis* individuals. At stations MLJ-31, 39, 41, 42, 48, 49, 51, 53 and 57 many individuals were covered by the red sponge *Crambe crambe*, especially abundantly at Tijesno station (MLJ-41), at Vela Tatinica cove (MLJ-48), at Zazupci Cape (MLJ-49), and at Veli most-N (MLJ-53). *A. noae* settled by epibionts appeared in the community of photophilic algae, already at depth of 3 to 5 m, and especially in the precoralligenous aspect of coralligenous community. The smallest live individual was extracted from sand sampled by Van Veen grab at the MLJ-112 station.

*Arca tetragona* Poli, 1795

Stations: MLJ-26, 51, 102, 112, D, K1.

Depth: 1–120 m.

Material: 6 live individuals (sized 3.6/1.5/1.7–6.2/2.8/3.1 mm, 2 not measured) and 10 valves (sized 8.4/4.0–18.6/8.7 mm).

- Habitat:** Attached by byssus under the stone, in agglomerations and on molluscan shells in muddy sand, and shells collected from sand and terrigenous ooze.
- Ecological significance:** Species of wide ecological distribution, noted in various bottom communities (GAMULIN-BRIDA, 1974; HRS-BRENKO & LEGAC, 1996; HRS-BRENKO, 1997).
- Remarks:** Common eastern Adriatic species. Live individuals were found among various biological material collected from an old trammel bottom net exposed between Kobrava and Moračnik islets (MLJ-D) and in the cluster inhabited by an unidentified haplosclerid sponge collected in the coralligenous community at Rastupa Cape (MLJ-51).

*Barbatia barbata* (Linnaeus, 1758)

- Stations:** MLJ-2, 5, 11–17, 20–23, 27–30, 32, 36, 38, 39, 41, 42, 44–49, 51–53, 57, 61.
- Depth:** From infralittoral fringe to 40 m of depth.
- Material:** 14 live individuals (3 measured, sized 10.6/6.1/?–12.0/6.3/? mm) and many shells noted; 38 shells collected: 10 paired shells sized 8.9/4.6/3.6–47.1/17.2/17.7 mm (5 not measured) and 28 valves (sized 6.3/3.4–34.1/36.2 mm, 16 valves not measured).
- Habitat:** Attached by byssus on rocks covered by photophilic algae, in rock crevices, and in biotic agglomerations.
- Ecological significance:** Species of wide ecological distribution, noted in various bottom communities (PÉRÈS & PICARD, 1964; GAMULIN-BRIDA, 1974; HRS-BRENKO & LEGAC, 1996; HRS-BRENKO, 1997).
- Remarks:** Fresh empty shells were frequently observed in the area investigated. However, *Barbatia barbata* was rarely noted by divers and only a few live individuals were collected in the community of photophilic algae at MLJ-11, 12, 30, 41, 42, 47, 49, 51 and 53, and in the coralligenous community at MLJ-16 and 47 stations. In the Veliko jezero inlet at station Veli most-N (MLJ-53) one empty shell (7.9 mm in length) was isolated from a big *Cladocora caespitosa* colony.

*Barbatia clathrata* (Defrance, 1816) (Fig. 3.)

- Stations:** MLJ-15, 16, 42, 51.
- Depth:** 10–43 m.
- Material:** 2 live individuals (4.0/2.1/1.8 and 5.3/2.8/2.0 mm) and 10 valves (sized 7.8/3.9–11.1/5.9 mm).
- Habitat:** Isolated from a cluster and collected from coarse sand mixed with shell litter.
- Ecological significance:** Not defined.
- Remarks:** Rarely noted species in the area studied and rarely sampled in the eastern Adriatic Sea (HRS-BRENKO & LEGAC, 1996). Live individuals were found in the coralligenous community at Rastupa Cape (MLJ-51) in a cluster with red algae *Peyssonnelia squamaria*, *Peyssonnelia polymorpha*, *Mesophyllum expansum*, a haplosclerid sponge and bryozoans *Scrupocellaria reptans* and *Cellepora pumicosa*.

*Anadara polii* (Mayer, 1868) (Fig. 4.)

Stations: MLJ-A, B, C, 105, 106, 107, 109, 118.

Depth: 60–110 m.

Material: 13 shells (11 valves sized 1.6/1.3–28.3/23.7 mm and 2 paired shells, one 28.1/22.0/19.0 mm, the other not measured).

Habitat: Muddy sand with bivalve shells and sandy mud with bryozoan debris.

Ecological significance: Species occurring in mixed sediments. Noted in various facies of the community of the coastal detrital bottom (PICARD, 1965; HRS-BRENKO & LEGAC, 1996; HRS-BRENKO, 1997).

Remarks: Only one recent adult empty shell was found in the community of the coastal sandy detritic bottom mixed with ooze at station MLJ-C. At MLJ-B station shells were collected from the sandy muddy sediment rich in *Cellaria fistulosa* colonies. Two juvenile shells (1.6/1.3 and 2.2/1.9 mm) were sampled at MLJ-105 and 107. HRS-BRENKO (1997) and PEHARDA (2003) cited the species as *Anadara diluvii* (Lamarck, 1805), which has commonly been used inappropriately for the recent records of *Anadara polii* species, since *A. diluvii* is an extinct species described from the Miocene of France (GOFAS, pers. comm.).

**NOETIIDAE Stewart, 1930***Striarca lactea* (Linnaeus, 1758)

Stations: MLJ-2-4, 6, 8, 9, 11, 14, 16, 18, 27, 29, 30, 36, 38, 39, 41–54, B, C, D.

Depth: From infralittoral fringe to 80 m depth.

Material: 149 live individuals (sized 1.8/1.2/0.9–11.9/8.5/7.6 mm, 45 not measured) and 71 shells (26 paired shells, 2 measured 4.1/2.6/2.1 and 8.9/6.1/5.2 mm, and 46 valves sized 7.3/5.2–15.8/9.7 mm, 39 not measured).

Habitat: Attached by byssus to rocks and stones covered with algal turf, in rock crevices and holes, in clump of sponges, on molluscan shells, and among corals.

Ecological significance: A species of wide ecological distribution occurring in various bottom communities (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; HRS-BRENKO & LEGAC, 1996; HRS-BRENKO, 1997).

Remarks: Common species in the area surveyed. Noted at the infralittoral fringe at Sv. Marija islet (MLJ-4) under round and flat stones. At Mali most (MLJ-8) adults were removed from the bryozoan colony *Schizobrachiella sanguinea*, at Tatinica (MLJ-45) and in Polače Cove, and at Gundulišta station (MLJ-38) occurred among red algae *Osmundaria volubilis* and *Rytiphlaea tinctoria*. One individual was found at Debela punta station (MLJ-39) on the sponge *Acanthella acuta*, in Veliko jezero at Sladingradac station (MLJ-3) on *Pecten jacobaeus* shell, and at Tatinica station (MLJ-45) on a *Laevicardium oblongum* shell. At Veli most-N (MLJ-53) 11 juveniles were isolated from a big *Cladocora caespitosa* colony, a few were found at Kula islet (MLJ-47) and in Vela Tatinica Cove (MLJ-48) among the

brown algae *Cystoseira sp.*, one was collected at Podvrti station (MLJ-36) on the red alga *Neurocaulon sp.*, and at Tjesno station (MLJ-41) one juvenile was found attached to a leaf of *Posidonia oceanica*. At Veli most-N (MLJ-53) one juvenile individual was isolated from an agglomeration with the sponge *Ircinia sp.* The smallest specimen was collected together with various biological materials from a trammel bottom net exposed north of Glavat Islet (MLJ-C). Live individuals were collected mostly from stones or rocks covered with algae in a community of photophilic algae, in coralligenous community, and in organogenic clumps. Shells were often extracted from sediment to about 80 m depth.

### GLYCYMERIDIDAE Newton, 1916

#### *Glycymeris bimaculata* (Poli, 1795)

Station: MLJ-52.

Depth: 20–30 m.

Material: One paired shell (18.7/17.5/10.9 mm)

Habitat: Sand in the *Posidonia oceanica* meadow.

Ecological significance: Not yet defined (LEGAC & HRS-BRENKO, 1999).

Remarks: Common species in the eastern Adriatic Sea distributed from Izola to Dubrovnik, but with no previous record in the area of Mljet Island (LEGAC & HRS-BRENKO, 1999).

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

Stations: MLJ-18, 23, 28, 29, 31, 41, 43, 45, 48, 50, 51.

Depth: 5–42 m.

Material: 10 shells (7 paired shells, only 2 measured 50.8/49.6/31.3 and 52.3/51.6/33.8 mm; 3 valves of 17.8/17.1 and 56.4/59.4, one not measured).

Habitat: Collected from coarse sand somewhere mixed with shell debris, and muddy sand mixed with shells and settled by *Osmundaria volubilis*.

Ecological significance: A strictly sand-living species characteristic of the community of rough sands and fine gravel under the influence of bottom currents (PÈRÈS & PICARD, 1964; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; LEGAC & HRS-BRENKO, 1999).

Remarks: Common species in the surveyed area. The inside of one shell collected at Tatinica station (MLJ-45) in the *Osmunadria volubilis* facies of the community of coastal detritic bottom was coated with the eggs of an unidentified gobiid fish. Previously reported for the area of Mljet Island by LEGAC & HRS-BRENKO (1999), but unfortunately with no exact location.



**MYTILIDAE Rafinesque, 1815***Mytilus galloprovincialis* Lamarck, 1819

Stations: MLJ-8, 13–18, 20, 24, 48, 49, 51–53, 59.

Depth: From mediolittoral zone and infralittoral fringe to 30 m depth.

Material: Many live individuals observed by divers, but not collected. 2 paired shells collected (one 14.9/17.5/7.0 mm, the other not measured).

Habitat: Attached by byssus to rocks covered with algae, and in rock crevices.

Ecological significance: A species of wide ecological distribution, accompanying the community of lower mediolittoral rocks. It is characteristic of the community of photophilic algae. Also occurring on various hard substrata dispersed in meadows of marine phanerogams. In the medio- and upper infralittoral zones it is a significant species in various facies (PÉRÈS & PICARD, 1964; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Abundant in the southern part of the investigated area, especially at Velika priveza (MLJ-15), Lenga Cape (MLJ-16), and Tojsti Cape (MLJ-18). At Lenga Cape and Zavrti station (MLJ-17) mussels were attached to rocks in the belt of *Cystoseira spicata*. At Velika priveza station shells were encrusted by bryozoan colonies.

*Mytilaster lineatus* (Gmelin, 1791)

Stations: MLJ-16, 18.

Depth: Infralittoral fringe and at 10 m depth.

Material: One live individual (not measured) and a single shell (4.1/7.1 mm).

Habitat: Scraped from rock. The shell was found in sand mixed with shell litter.

Ecological significance: Occurred in the communities of the lower mediolittoral and the upper infralittoral rocks covered with algae (PÉRÈS & GAMULIN-BRIDA, 1973).

Remarks: The only live individual was sampled at Tojsti Cape (MLJ-18). The reason for the small number of *Mytilaster lineatus* found in the investigated area perhaps is the misidentification of specimens arbitrarily noted as *Mytilaster minimus*.

*Mytilaster minimus* (Poli, 1795)

Stations: MLJ-4, 14, 16–19, 22, 25, 28, 29, 32, 34, 36, 45, 47, 48, 52.

Depth: Lower mediolittoral zone and from infralittoral fringe to 10 m depth.

Material: Many live individuals noted, but not collected. 2 valves collected (one 9.7/4.9 mm, the other not measured).

Habitat: Attached by byssus to rocks and rock crevices in small groups, common in small mediolittoral pools.

Ecological significance: An accompanying species of the community of the lower mediolittoral and the upper infralittoral rocks (PÉRÈS & PICARD, 1964; PÉRÈS & GAMULIN-BRIDA, 1973; HRS-BRENKO, 1997).

Remarks: Frequently noted species in the mediolittoral zone. Shells were collected from sand mixed with shell litter at Glavica od mosta (MLJ-25) and

from coarse gravel at Pračarica station (MLJ-4). The species was noted at sheltered (MLJ-4, 25, 45, 48, and 52), as well as at exposed localities of the lower mediolittoral zone (other stations).

*Modiolarca subpicta* (Cantraine, 1835)

Stations: MLJ-2, 13, 15, 25, 28, 29, 45, 53, D.

Depth: From the mediolittoral zone and infralittoral fringe to 50 m depth.

Material: 46 live individuals (sized 3.5/2.4/2.3–20.0/10.6/10.0 mm, 3 not measured) and 6 paired shells collected (sized 1.8/2.3/?–6.5/4.6/4.2 mm, one not measured).

Habitat: Collected from rocky substrate in a small mediolittoral pool, between algae, sponges, tunicates, and bivalve shells.

Ecological significance: Not defined.

Remarks: Common in the area surveyed. Two juvenile individuals were picked from a big *Cladocora caespitosa* colony at Veli most-N (MLJ-53) in the Veliko jezero inlet, and one juvenile was sampled from the small mediolittoral pool at Debeli rat (MLJ-29). More than 30 live individuals were collected from an old net removed from the bottom at the station MLJ-D.

*Musculus costulatus* (Risso, 1826)

Stations: MLJ-42, 50–52.

Depth: 3–30 m.

Material: 9 live individuals (7 sized 1.6/0.9/0.6–3.7/2.2/1.4 mm, 2 not measured).

Habitat: Sampled between algae, under and on the stones covered with algae, and in organogenic clumps.

Ecological significance: A species associated with the community of photophilic algae (PÉRÈS & PICARD, 1964), but considered a species exclusive to the same community by ZAVODNIK (1971) and HRS-BRENKO (1997).

Remarks: In the precoralligenous aspect of a coralligenous community at Rastupa Cape (MLJ-51) one individual was isolated from the clump with an unidentified *Haplosclerida* sponge. At the other stations individuals were collected in the community of photophilic algae.

*Lithophaga lithophaga* (Linnaeus, 1758)

Stations: MLJ-1-5, 7–9, 11, 13–18, 23, 26–30, 34–36, 40–43, 45–53, 58, 59.

Depth: From the infralittoral fringe to 40 m depth.

Material: Many live individuals observed by divers, 19 sampled (sized 2.5/6.4/2.0–16.1/49.2/14.9 mm, 2 not measured) and 4 paired shells collected (not measured).

Habitat: Endolithic in limestone rocks, in outcrops and loose stones in phanerogam meadows, and in biogenic clusters.

Ecological significance: An accompanying species of the community of lower mediolittoral rocks and community of photophilic algae

(GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997), especially noted in the *Corallina mediterranea* facies (PÉRÈS & PICARD, 1964).

Remarks: Frequent, especially down to a depth of 5 m in the lakes and at some sea stations (MLJ-14, 17, 26, 40, 41, 46–48, 50, 51, 54). One juvenile was isolated from the clump of encrusting alga *Mesophyllum expansum* and sponges at Lenga Cape (MLJ-16), and two juveniles were found within the *Cladocora caespitosa* colony at Veli most-N (MLJ-53). Adults mostly occurred in large numbers in the community of photophilic algae. Apparently, this valued shellfish is not harvested in the investigated area. At MLJ-14, 15, 17 and 41 the shellfish was noted in the infralittoral fringe. At Kobrava Islet-S (MLJ-46) down to a depth of 5 meters individuals have settled about 5 centimetres apart. Empty borings were used as refuge or natural habitats for many sessile and motile species such as small pectinid shellfish (*Chlamys varia* at MLJ-36) and various blenniid fishes.

*Modiolus barbatus* (Linnaeus, 1758)

Stations: MLJ-1, 2, 5, 7–9, 24, 25, 30, 40, 44, 46, 53, 101, 113, D.

Depth: From infralittoral fringe to 68 m depth.

Material: 23 live individuals (sized 2.1/3.4/1.6–31.0/61.6/23.4 mm, 5 not measured). Many individuals observed, but not collected. 10 paired shells (sized 4.8/5.6/?–19.2/31.9/14.8 mm, 2 not measured) and 19 valves (sized 1.7/2.2–20.0/34.1 mm, 4 not measured).

Habitat: Attached to rocks and stones covered by algae, on molluscs shells and hard substrata on muddy sand mixed with shell debris, sandy gravel and coarse sand mixed with broken shells, sand mixed with *Spongites fruticulosus* and various *Lithothamnion* debris.

Ecological significance: A species of wide ecological distribution (ZAVODNIK, 1971; HRS-BRENKO, 1997).

Remarks: Large specimens (about 5 cm long) were noted in the area of Malo Jezero at Velika Priježba (MLJ-9) and Glavica od mosta (MLJ-25) forming clusters with other bivalves (*Arca noae*, *Gastrochaena dubia*, *Pseudochama gryphina* and *Chlamys varia*). The clusters lay on the sand mixed with broken shells in *Cymodocea nodosa* meadows, and on muddy sand mixed with shell debris. Juveniles were found attached to shells of *Venus verrucosa* at Velika priježba (MLJ-9) and *Glycymeris* sp. at Kobrava Islet-S (MLJ-46). Eight juveniles (sized 2.1/3.4/1.6–3.5/5.4/2.8 mm) were collected from the old net which was removed from the bottom at the station MLJ-D, and one was isolated from a big *Cladocora caespitosa* colony. From the sand mixed with *Lithothamnion* particles at MLJ-101 and 113 only 2 single shells were collected.

*Modiolus adriaticus* (Lamarck, 1819)

Stations: MLJ-38.

Depth: 5–10 m.

Material: 2 valves (10.4/19.2 and 11.2/19.4 mm)

- Habitat: Collected from muddy sand mixed with broken shells.
- Ecological significance: A species with a not yet defined ecological significance (PICARD, 1965).
- Remarks: Very rare species in the area studied. PARENZAN (1974) quoted the species for muddy, sandy and detritic bottoms. At MLJ-38 station muddy sand was sparsely overgrown by *Flabellia petiolata* and *Rythiphlaea tinctoria* and it was black in colour 1 to 2 cm below the surface. Collected shells were light brown to dark brown with light red radial lines and one or two purple lines.

### PINNIDAE Leach, 1819

#### *Pinna nobilis* Linnaeus, 1758

- Stations: MLJ-2-7, 9, 11, 16, 20, 22, 24, 25, 27, 28, 30, 32, 34–36, 38–42, 45–48, 50, 51, 53–57, 59, C.
- Depth: 0.5–37, 80 m.
- Material: About 200 individuals and 12 empty shells counted. One live individual collected by the bottom set net (322.0/132.5/35.5 mm). Shellfish sizes are noted under »Remarks«.
- Habitat: Observed in the marine phanerogam meadows on sandy and muddy sand bottoms, on muddy sand mixed with shell debris, coarse sand, fine muddy sand mixed with shells, and muddy sand sparsely overgrown by *Flabellia petiolata* and *Rythiphloea tinctoria*.
- Ecological significance: Preferential species for the community of marine phanerogams (GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).
- Remarks: This species, protected by law, was frequently observed in the area studied, especially in the Malo and Veliko jezero. Draganović (1980) noted that *P. nobilis* was not numerous in the Veliko jezero inlet, and he had encountered no individuals in the Malo jezero. On the contrary, we have located dense populations of *P. nobilis* in the Malo jezero (MLJ-9, 24, 25) and at Sv. Marija islet (MLJ-5) in the Veliko jezero inlet. In the summer 1996 the specimens of 30 to 40 cm in height above the sediment level were only noted since juveniles generally were absent. In summer of 1998 smaller individuals (5 to 20 cm) and increase of the populations in the Malo jezero inlet have been recorded. On the other hand, single adult specimens of *P. nobilis* (height above the sediment 60 to 80 cm, exceptionally to 100 cm) were observed deeper than 10 m at investigated stations along the coast of National Park. At sea stations the fan shell was present in the *Posidonia oceanica* beds, and in the lakes it occurred in *Cymodocea nodosa* meadows. At Rastupa (MLJ-51) and Lenga capes (MLJ-16), and at Moračnik islet-N (MLJ-57) individuals were found embedded in the sand deposited on rocky steps of about 40 meters high underwater cliffs. Two individuals (cca. 50 cm in height) buried in the hole formed under the large *Cladocora caespitosa* colony were noted at Veli most-N (MLJ-53) in the Veliko jezero inlet. *Pinna nobilis* population

in Malo and Veliko Jezero was studied throughly by ŠILETIĆ & PEHARDA (2003).

*Atrina pectinata* (Linnaeus, 1767)

Stations: MLJ-C, K1.

Depth: 80–120 m.

Material: Two live individuals (220.3/121.0/45.3 and 237.0/130.2/43.0 mm) and one paired shell (sizes of the damaged shell were 161.0/82.3/29.9 mm).

Habitat: Sandy bottom partly mixed with mud, and terrigenous ooze.

Ecological significance: A characteristic species to the community of detrital bottom of the open insular zone and open sea, and an accompanying species to the community of coastal sandy detrital bottom partly mixed with ooze (GAMULIN-BRIDA, 1974).

Remarks: Rarely noted in the investigated area. One live individual and paired shell were collected by the commercial trawl towed on coastal terrigenous ooze at station MLJ-K1.

**PTERIIDAE Gray, 1847 (1830)**

*Pteria hirundo* (Linnaeus, 1758)

Stations: MLJ-A, D, K1.

Depth: 50–70, 100–120 m.

Material: 4 live individuals (27.4/15.7/5.1, 28.1/27.5/6.8, 29.0/15.1/6.0 mm, 1 not measured), 1 paired shell (38.4/21.0/7.6 mm), and 1 valve (not measured).

Habitat: Sampled from the radiole spine of sea urchin *Cidaris cidaris*, and among molluscs, crabs and bryozoans settled on an old trammel bottom set.

Ecological significance: An epibiotic species of wide ecological distribution, usually noted in the communities of offshore detritic bottom, and coastal terrigenous ooze (PÉRÈS & PICARD, 1964; GAMULIN-BRIDA, 1974).

Remarks: Not all specimens were measured because shells were broken. Rare species in the Mediterranean Sea (SALVINI-PLAWEN, 1991).

**PECTINIDAE Rafinesque, 1815**

*Pecten jacobaeus* (Linnaeus, 1758)

Stations: MLJ- 2, 3, 6, 11, 13, 22, 29, 30, 36, 39–41, 43, 45, 46, 48–50, 53, 54, A, B.

Depth: 5–80 m.

Material: Many live individuals observed. 5 live (one of sizes 39.7/36.8/10.8 mm) and 28 paired shells collected (16 measured, sized 25.6/25.2/5.2–135.8/121.6/44.6 mm).

Habitat: Noted and collected in phanerogam meadows from fine sand partly mixed with ooze, in muddy sand with shell litter, and muddy deposit mixed with shells.

Ecological significance: An exclusive species of the community of coastal detrital bottom (PICARD, 1965; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: At stations in the Veliko jezero inlet (MLJ-2, 6, 36, and 53) occasionally large populations of *P. jacobaeus* were noted in the community of coastal detritic bottom below the 20 m depth. These specimens (live individuals and shells) were large, mostly above 100 mm in length. On the contrary, all specimens collected at stations along the sea coast were smaller (25.6–78.8 mm in length). At Sikjerica (MLJ-22) and Lenga capes (MLJ-40), and Ovrata islet-W (MLJ-43) only shells were collected from the sediment in the *Posidonia oceanica* meadows. At Veli Most-W (MLJ-54) shells were noted on the mud and muddy sand mixed with *Spongites fruticulosus* and overgrown by *Rytiphlaea tinctoria*, *Osmundaria volubilis*, and *Flabellia petiolata*. At Sladingradac (MLJ-3) *P. jacobaeus* inhabited mud mixed with fragments of *Lithophyllum racemus*. At Zazupci Cape (MLJ-49) one shell was collected from coarse sand mixed with shells deposited on the step of a typical underwater cliff. The biology of *P. jacobaeus* was studied by ONOFRI & MARGUŠ (1995) in Veliko Jezero at the Vrbovačka locality (near our MLJ-3 station).

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

Stations: MLJ-41, 46, 101–104, 106, 107, 109, 112, 113, 120, 121, B, D.

Depth: 20–104 m.

Material: 44 live individuals (sized 2.3/2.5/0.6–30.4/30.6/9.1 mm) and 40 valves (sized 3.5/3.9–20.8/21.3 mm).

Habitat: Collected from sand, muddy sand, bryozoan colonies, and *Posidonia oceanica* leaves.

Ecological significance: Not yet defined (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974).

Remarks: At MLJ-D station many live individuals, juveniles and adults, were collected from an old trammel bottom net among a lot of bryozoan, molluscan and other species. Five juveniles (sized 2.4/2.8/0.8–4.2/4.8/1.2 mm) were sampled from the big *Cellaria fistulosa* colony at MLJ-B station, and the smallest shellfish was removed from a leaf of *Posidonia oceanica* at Tijesno station (MLJ-41). Shells were also collected with the Van Veen grab at stations MLJ-101 to 121. Specimens showed a large range of colours from yellow, orange, dark red to brown.

#### *Lissopecten hyalinus* (Poli, 1795)

Stations: MLJ-21-23, 29, 31, 39–41, 43–46, 48, 53.

Depth: 2–30 m.

Material: 5 live individuals (sized 14.5/13.6/4.0–20.1/18.6/6.0 mm, 2 not measured) and 21 shells (3 paired shells sized 14.2/13.2/3.9–21.7/20.1/7.1 mm, 8 not measured, and 8 valves sized 11.4/11.0–20.3/18.9 mm, 2 not measured).

- Habitat: Collected from coarse sand in *Posidonia oceanica* meadows, and muddy sand mixed with broken shells.
- Ecological significance: A characteristic species of the community of marine phanerogams (GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).
- Remarks: One live individual was collected from a discarded plastic tube in the *Posidonia oceanica* meadow at Pomena Cove (MLJ-21). Yellow specimens prevailed but light brown to greenish specimens with little white spots on the valves were also noted.

*Palliolium incomparabile* (Risso, 1826)

- Stations: MLJ-47, 113, 118, B, C, D.
- Depth: 50–85 m.
- Material: 6 live individuals (sized 3.1/3.7/0.8–12.8/12.5/3.6 mm) and 4 shells collected (2 paired shells 7.7/7.9/2.2 and 8.6/8.7/2.5 mm and 2 valves i.e. 5.1/5.5 mm and 1 not measured).
- Habitat: Collected from muddy sand with bryozoans, sand mixed with *Lithothamnion* debris, and rock settled by bryozoans.
- Ecological significance: Species characteristic of the coralligenous community and community of coastal detrital bottoms (PICARD, 1965; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).
- Remarks: Apparently rare in the area studied. More often found at deeper stations. Three juveniles (sized 3.1/3.7/0.8–5.5/5.8/1.3 mm) were collected from the colony of *Cellaria fistulosa* at station MLJ-B. Collected specimens differed much in colour, from transparent with orange spots, yellow, light orange to orange, light red to crimson, and brown speckled with white spots and lines (Fig. 5.).

*Palliolium striatum* (O.F. Müller, 1776)

- Stations: MLJ-109, 116.
- Depth: 87 and 102 m.
- Material: 2 valves (10.9/11.8 and 13.3/14.6 mm).
- Habitat: Collected from muddy sand mixed with bivalvian shells, and sandy mud.
- Ecological significance: Not defined.
- Remarks: Obviously rare in the area surveyed. The colour of shell collected at MLJ-116 was in general light yellow but crossing to orange toward the margins. The shell from MLJ-109 was transparent and also light yellow in colour with orange spots and white lines (Fig. 6.).

*Pseudamussium clavatum* (Poli, 1795)

- Stations: MLJ-102, 104, 105, 107, 109, 119.
- Depth: 83–107 m.
- Material: 13 shells (11 valves sized 9.2/10.6–18.8/19.7 mm and 2 paired shells 14.4/15.1/3.5 and 22.6/24.1/6.3 mm).

- Habitat: Sampled from sand, sandy mud with small shell debris, and muddy sand with bivalvian shells.
- Ecological significance: PICARD (1965) considered it an accompanying species with no defined ecological significance, while GAMULIN-BRIDA (1974) and HRS-BRENKO (1997) classified it as a preferential species for the community of detrital bottoms of the open insular zone and open sea.
- Remarks: The species recorded only in deeper zones of investigated area. Shells varied in colour from yellowish white and gray (right valve) to orange and light yellow spotted with orange (left valve). Rare in the Mediterranean Sea (SALVINI-PLAWEN, 1991).

*Pseudamussium sulcatum* (O.F. Müller, 1776)

- Stations: MLJ-K1.
- Depth: 100–120 m.
- Material: One valve (23.0/28.7 mm).
- Habitat: Extracted from terrigenous ooze.
- Ecological significance: A species accompanied to the bathyal community of white corals (PÉRÈS & PICARD, 1964).
- Remarks: This fairly rare circalittoral species PARENZAN (1974) and POPPE & GOTO (1993), reported as *Chlamys bruei* (PAYRAUDEAU, 1826) (Fig. 7.).

*Crassadoma multistriata* (Poli, 1795)

- Stations: MLJ- 13, 14, 16, 18, 29, 30, 34, 42, 44, 45, 47–53, 113, A, B, D.
- Depth: 5–80 m.
- Material: 22 live individuals (sized 3.9/4.3/1.4–15.4/8.7/6.9 mm, 14 not measured), many shells recorded and 36 collected (19 paired shells sized 3.3/3.7/0.9–21.3/24.6/8.0 mm, 13 not measured, and 17 valves sized 6.5/7.8–15.2/18.0 mm, 5 not measured).
- Habitat: Collected from rocks covered with algae, bryozoans and sponges, noted in holes under loose stones and boulders, within organogenic clumps, and picked from shells dispersed in sediments such as coarse sand with shells, muddy sand with *Osmundaria volubilis*, sand in *Posidonia oceanica* meadows, and sand mixed with *Lithothamnion* debris.
- Ecological significance: An accompanying species which ecological significance was not yet defined (PICARD, 1965).
- Remarks: Recorded frequently in the area studied, especially at sea stations along the coast of National Park. The smallest specimen was collected together with other bivalve species from the old trammel bottom net at MLJ-D station. Two juveniles were isolated from the colony of *Cellaria fistulosa* at MLJ-B station. Live individuals were mostly collected from biotic agglomerations in the coralligenous community, like at Lenga Cape (MLJ-16) where one specimen was removed from *Mesophyllum expansum* thallus. The species was mostly found at open sea stations and only one shell was recorded at Veli most-N (MLJ-53), near the entrance of the Veliko jezero inlet. Collected individuals varied from yellow to purple in colour.



*Chlamys flexuosa* (Poli, 1795)

Stations: MLJ- 14, 48, 50, D.

Depth: 15–50 m.

Material: One live individual (20.7/18.8/5.0 mm) and 3 paired shells (11.3/11.0/2.6 and 13.1/12.5/3.0 mm, 1 not measured).

Habitat: Collected from coarse sand mixed with shells in phanerogam meadows, rock covered by algae, and among molluscan shells dispersed in muddy sand.

Ecological significance: Species characteristic of the community of coastal detrital bottom and coastal detrital bottom partly mixed with ooze (GAMULIN-BRIDA, 1974).

Remarks: Rarely noted in the area surveyed. The only live individual was collected beside the rhizome of *Posidonia oceanica*.

*Chlamys glabra* (Linnaeus, 1758)

Stations: MLJ-8, 9, 14, 16, 24, 25, 27, 29, 36, 43.

Depth: 0.5–40 m.

Material: Many live individuals and shells noted by divers. 6 live individuals (sized 34.9/33.9/14.0–51.7/49.5/18.7 mm, 1 not measured) and 7 shells collected (4 paired shells, two of them 35.9/34.9/13.3 and 39.4/39.1/15.3 mm, respectively, and 3 valves sized 33.4/33.3–40.2/40.2 mm).

Habitat: Collected from gravel, coarse sand mixed with shells, muddy sand mixed with shell debris, and sandy sediment in the *Cymodocea nodosa* meadow.

Ecological significance: Not yet defined.

Remarks: Frequent in the Malo jezero. Live individuals were observed at Velika Priježba (MLJ-9) in the *Cymodocea nodosa* meadow and on muddy sand mixed with shell debris. In the summer 1997 live specimens mostly about 35 mm in length and height were noted. One year later *C. glabra* specimens sized about 50 mm were recorded. One live individual (not measured) was noted also at Ovrata Islet-W (MLJ-43). Left valve of specimens studied varied from dirty white to light yellow and greenish to brown in colour with white and black speckles. Right valves were yellowish to light pink in colour (Figs. 8a, 8b).

*Chlamys pesfelis* (Linnaeus, 1758)

Stations: MLJ-13-17, 28-30, 32, 34, 41, 42, 47–52, 57, C.

Depth: 5–80 m.

Material: One live individual and many shells observed by divers. 7 paired shells (sized 20.8/26.5/6.4–42.5/48.1/? mm, 2 not measured) and 12 valves collected (sized 15.7/19.7–44.1/51.9 mm, 5 not measured).

Habitat: Collected from rocks covered with algae, in sand between loose stones, in *Posidonia oceanica* meadows, and in coarse to muddy sand mixed with shell debris.

Ecological significance: Species characteristic of the coralligenous community (GAMULIN-BRIDA, 1974).

Remarks: Recorded only in the coralligenous community at sea stations. Somewhere empty shells were quite common in the local thanatocoenose. The single live specimen was noted in the coralligenous community at Rastupa Cape (MLJ-51) at the 30 meters depth.

*Chlamys varia* (Linnaeus, 1758)

Stations: MLJ-1-9, 13-16, 18, 23-25, 27, 29, 35, 36, 38, 39, 41, 42, 46, 47, 49, 51-54, 58, B, D.

Depth: From infralittoral fringe to 80 m depth.

Material: Many live individuals and shells noted. 17 live individuals sized 4.1/4.6/1.3-18.1/21.5/6.6 mm (9 not measured) and 14 shells collected (4 paired shells sized 4.3/5.2/1.4-13.8/16.8/5.1 mm, 1 not measured, and 10 valves sized 8.5/10.1-51.9/56.6 mm, 3 not measured).

Habitat: Collected from rocks covered with algae and sponges, from biogenic clusters, coral *Cladocora caespitosa* colonies and empty bivalve shells, from gravel, coarse sand mixed with shell litter, sand in marine phanerogam meadows, and muddy sand mixed with shell debris.

Ecological significance: Species preferential for the community of coastal detrital bottoms and the community of detrital bottoms of the open insular zone and open sea (GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Common in the area surveyed. In the lakes, especially in the Malo jezero inlet it forms the clusters with other bivalve species. The largest shells were collected in gravel at Mali most (MLJ-8). At Podvrti station (MLJ-36) at a few meters depth live individuals occurred in holes burrowed by date shells. One juvenile (4.4/6.4/1.3 mm) was isolated from the *Cystoseira* sp. thallus at Kula islet (MLJ-47) and another one (not measured) from the shell of *Pinna nobilis* at Velika Priježba (MLJ-9). One live specimen and a paired shell were isolated from the big *Cladocora caespitosa* colony at Veli most-N (MLJ-53). From the colony of *Cellaria fistulosa* at MLJ-B station only shells were isolated. Live individuals at the most were collected from rocks in the community of photophilic algae and coralligenous community.

*Semipallium coruscans coruscans* (Hinds, 1845)

Stations: MLJ-B.

Depth: 80 m.

Material: One live individual (5.2/4.8/1.2 mm).

Habitat: Collected from a colony of *Cellaria fistulosa*.

Ecological significance: Species favours areas of clean water with strong currents (WALLER, 1972).

Remarks: Detailed description of the specimen is given in ŠILETIĆ (2004). According to the author this is the first record of this Indo-Pacific species in the Adriatic and Mediterranean Sea. However, with no proofs for its

successful reproduction in Adriatic waters, establishment success is not expected. Therefore it is considered an alien species (ŠILETIĆ, 2004).

### SPONDYLIDAE Gray, 1826

*Spondylus gaederopus* Linnaeus, 1758

Stations: MLJ- 2, 16, 21, 23, 26, 29, 30, 34, 39, 41, 42, 45, 47, 51, 53, 54.

Depth: From infralittoral fringe to 43 m depth.

Material: 4 live individuals (not collected and not measured) and 20 shells (14 paired shells not measured, and 6 valves sized 5.2/6.6–73.0/86.0 mm).

Habitat: Attached to rocks and loose stones, among madreporarian colonies. Shells noted in coarse sand mixed with shells, somewhere in *Posidonia oceanica* beds.

Ecological significance: A species occurring in the community of photophilic algae (HRS-BRENKO, 1997).

Remarks: The smallest shell, only 5.2 mm long, was found in the large *Cladocora caespitosa* colony at Veli most-N (MLJ-53). A few live specimens were recorded at Kavalo cove (MLJ-2), Debeli rat (MLJ-29), Goli rat (MLJ-34), and at Tijesno strait (MLJ-41).

### ANOMIIDAE Rafinesque, 1815

*Anomia ephippium* Linnaeus, 1758

Stations: MLJ- 3, 25, 40, 52, 53, B, C, K1.

Depth: 5–120 m.

Material: 12 live individuals, 2 measured (3.4/4.3/? and 23.5/22.7/1.8 mm).

Habitat: Attached to rocks, stones, corals, molluscan shells, and various hard substrata.

Ecological significance: An epibiotic species of wide ecological distribution (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Very variable in shell form due to the hard substrata it attaches to. Specimens were collected from bivalve shells such as *Pecten jacobaeus*, *Chlamys varia* and *Venus verrucosa*, and from the *Cladocora caespitosa* colony at Veli most-N (MLJ-53).

*Pododesmus patelliformis* (Linnaeus, 1761)

Stations: MLJ-1, 2, 3, 6, 9, 44, 46, 102, 107, 112, 118, A, B, C, D.

Depth: 1–103 m.

Material: 25 live individuals (sized 4.4/4.2/1.5–34.7/36.2/6.0 mm) and 4 valves (sized 10.5/11.7–22.0/24.2 mm).

Habitat: Attached to various hard substrata, live molluscs shells, and bryozoans.

Ecological significance: An accompanying species with an as yet undefined ecological significance (PICARD, 1965).

Remarks: Shells were collected from the sandy and partly muddy sediments. One juvenile (7.5/8.5/2.1 mm) was isolated from the *Cellaria fistulosa* colony

at MLJ-B. At Kobrava islet-S (MLJ-46) one individual was collected from an amphora, and the two largest specimens (34.6/32.1/5.4 and 34.7/36.2/6.0 mm) were taken from a *Pinna nobilis* shell at MLJ-C station.

### LIMIDAE Rafinesque, 1815

#### *Lima lima* (Linnaeus, 1758)

Stations: MLJ-5, 13, 14, 16, 18, 22, 28–30, 32, 34, 35, 39–42, 44, 47–49, 51, 52.

Depth: 1–40 m.

Material: 13 live individuals and many shells recorded by divers, but only 5 live individuals (sized 8.3/9.0/3.9–45.2/49.6/19.2 mm) and 14 shells collected (2 paired shells, one measured 33.9/47.3/17.7 mm, and 12 valves sized 9.7/10.6–42.5/53.1 mm, 5 not measured).

Habitat: Observed under stones, in rock crevices, in a big empty pen shell, and on sandy sediments.

Ecological significance: Species characteristic of the coralligenous community (GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Common along the coast of the national park, usually found in the precoralligenous aspect of coralligenous community (at MLJ-18, 44, 48, 49), and in the coralligenous community at Zazupci (MLJ-49) and Rastupa capes (MLJ-51). One live individual was found in an empty *Pinna nobilis* shell at Debela Ponta station (MLJ-39) at 20 m depth. Due to the absence of a typical coralligenous community in the lakes (present just with the precoralligenous aspect) only one live individual and one shell were noted in the Veliko jezero inlet at Sv. Marija islet (MLJ-5) and Priježba cove (MLJ-35).

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

Stations: MLJ- 13, 14, 17, 18, 27, 29, 30, 36, 41, 43, 44, 48, 49, 51–53, 57, D.

Depth: 2–50 m.

Material: 9 live individuals and many shells observed by divers; 7 live individuals (sized 2.4/3.3/1.0–10.7/14.6/5.0 mm, 4 not measured) and 13 shells collected (10 paired shells sized 7.2/9.6/3.5 to 14.9/16.1/16.1 mm and 3 valves, not measured).

Habitat: Collected from rocks and stones covered with algae, occurred at coarse sand and muddy sand mixed with shells, and muddy sand in a sparse *Posidonia oceanica* meadow.

Ecological significance: A characteristic species to the community of coastal detrital bottoms (ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Frequently noted at stations surveyed. According to HARMELIN & SCHLENZ (1964) it is considered exclusive to *Posidonia oceanica* meadows, although only shells were found. During our survey, a similar occurrence was noted at Lokva Cove (MLJ-27) and at Moračnik Islet-N

(MLJ-57). The smallest live specimen was collected in the community of photophilic algae at Vanji Školj islet (MLJ-13).

*Limaria tuberculata* (Olivi, 1792)

Stations: MLJ-2-4, 8, 11, 13, 16, 22, 23, 29, 32, 34, 36, 42-44, 46, 47, 49, 51-53, 57, 59.

Depth: 0.5-40 m.

Material: 4 live individuals (not collected and measured) and many shells noted by divers. 6 paired shells (17.4/20.4/8.8 and 22.4/24.4/13.3 mm, 4 not measured) and 8 valves (sized 18.6/21.6-29.8/32.0 mm, 4 not measured).

Habitat: Observed and collected on gravel, under stones, on rocks between algae, and on coarse sand mixed with shells.

Ecological significance: Not yet defined (ZAVODNIK, 1971).

Remarks: Frequently recorded in the area surveyed. Live individuals were observed on gravels at Mali most (MLJ-8), and in a rocky crevice and under stone at Lenga Cape (MLJ-16), on a rock covered with algae at Veli most-N (MLJ-53) and on coarse sand at Kobrava Islet-N (MLJ-44).

*Limatula gwyni* (Sykes, 1903)

Station: MLJ-44.

Depth: 57 m.

Material: 1 valve (4.7/7.7 mm).

Habitat: Muddy sand mixed with shell litter.

Ecological significance: Not known.

Remark: Collected with the metal hand grab.

## OSTREIDAE Rafinesque, 1815

*Ostrea edulis* Linnaeus, 1758

Stations: MLJ-1, 4, 5, 6, 21, 23, 25, 36, 39, 51, 54, 59.

Depth: From mediolittoral zone to 40 m depth.

Material: 11 live individuals noted by divers. 4 individuals (sized 22.4/20.4/3.9-42.2/43.7/6.8 mm) and 4 shells collected (3 paired shells, one of them 102.5/104.7/45.6 mm, and 1 valve 62.7/78.2 mm).

Habitat: Cemented to rocks and stones and other hard substrata on muddy sand mixed with shell litter.

Ecological significance: Species characteristic of the community of photophilic algae (GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: In the Malo jezero inlet at Glavica od mosta station (MLJ-25) large individuals were found cemented on hard substrate in muddy bottom covered by various broken shells, at 15 to 20 m depth in the community of the coastal detritic bottom partly mixed with ooze. At Sv. Marija islet (MLJ-5) oysters were distributed in the narrow mediolittoral belt. Also, large-sized oysters were noted on the *Pinna nobilis* shells at Velika priježba (MLJ-9) in Malo jezero, Pristanište cove (MLJ-55) in Veliko

jezero, and at Debela punta station (MLJ-39). In Solinski kanal station (MLJ-1) some specimens were encountered on solid waste.

### GRYPHAEIDAE Vyalov, 1936

#### *Neopycnodonte cochlear* (Poli, 1795)

Stations: MLJ-104, 105, 107, 109, A, K1.

Depth: 60–120 m.

Material: Many sampled shells, 10 valves sized 9.9/13.6 –?/48.7 mm.

Habitat: Collected from sand and muddy sand mixed with bivalve shells, and terrigenous ooze.

Ecological significance: A species preferring the community of the detrital bottom of the open insular zone and open sea (GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Clumps of many shells cemented together were collected with the bottom trawl at MLJ-K1 station, while single shells (mostly right valve) were collected by the Van Veen grab at other stations.

### LUCINIDAE Fleming, 1828

#### *Ctena decussata* (Costa O.G., 1829)

Stations: MLJ-2, 4, 5, 13, 14, 22, 23, 27–32, 36, 39–53, 57, C.

Depth: 0.5–80 m.

Material: 2 live individuals (6.6/5.8/3.4 and 14.8/13.0/8.1 mm) and 54 shells collected (20 paired shells sized 4.8/4.2/2.4–17.1/14.7/8.0 mm, 4 not measured, and 34 valves sized 4.8/3.9–16.4/14.7 mm, 7 not measured). Many more shells observed by divers, but not collected.

Habitat: Collections were made in coarse sand, sand and muddy sand mixed with shell litter, sand in *Posidonia oceanica* meadows, among *Cladocora caespitosa*, and on rocks with algae.

Ecological significance: Species characteristic of the community of sandy sediments of the calm mode (PÉRÈS & PICARD, 1964; GAMULIN-BRIDA, 1974).

Remarks: In the area surveyed it is one of the two species most frequently recorded in the sandy sediment mixed with shells. Only 2 live individuals were collected at Štit Islet (MLJ-14) in the community of photophilic algae, and Sikjerica Cape (MLJ-22) in meadows of marine phanerogam *Posidonia oceanica*. At Vanji školj islet (MLJ-13), Vela Tatinica cove (MLJ-48), and at Rastupa Cape (MLJ-51) shells were usually encountered on rocks covered with algae.

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

Stations: MLJ-1, 9, 21, 25, 27, 38, 39, 45, 46.

Depth: 1–30 m.

- Material:** 1 live individual (not measured) and 25 shells (22 valves sized 6.8/6.4–19.1/18.4 mm, 11 not measured, and 3 paired shells, not measured).
- Habitat:** Collected from coarse sandy and muddy detrital bottoms, and in sandy sediment within seagrass meadows.
- Ecological significance:** Species characteristic of the community of sandy sediments of calm mode (PÉRÈS & PICARD, 1964; GAMULIN-BRIDA, 1974).
- Remarks:** Common in the investigated area. One live individual was collected from the sediment in *Posidonia oceanica* meadow at Pomena Cove (MLJ-21). Shells were abundant in sandy and muddy detrital deposit in Polače Cove at stations MLJ-38 and 39, and in sand mixed with shells in Pomena Cove (MLJ-21).

*Lucinella divaricata* (Linnaeus, 1758)

- Stations:** MLJ-9, 16, 25, 41–44, 52.
- Depth:** 2–57 m.
- Material:** 2 live individuals (one measured 6.4/6.3/4.2 mm) and 14 shells (3 paired shells, one measured 9.2/8.0/6.1 mm, and 11 valves sized 4.4/4.0–7.1/7.1 mm, 4 not measured).
- Habitat:** Collected from coarse sand to muddy sand mixed with shell debris, and fine sand rich in shells in the *Posidonia oceanica* meadow.
- Ecological significance:** Species characteristic of the community of sandy sediments of calm mode (PÉRÈS & PICARD, 1964; GAMULIN-BRIDA, 1974).
- Remarks:** Live specimens were noted only in sand in the community of photophilic algae at Tijesno station (MLJ-41) and in the cluster of bivalves on detrital bottom at the station Glavica od mosta (MLJ-25).

*Anodontia fragilis* (Philippi, 1836)

- Stations:** MLJ- 9, 29, 38, 39, 43, 45, 46, 49, 50, 116.
- Depth:** 1–87 m.
- Material:** 1 live individual (5.6/5.0/3.4 mm) and 11 shells (3 paired shells, one measured 12.8/11.8/9.6 mm, and 9 valves, two measured 9.7/8.4 and 10.2/9.4 mm).
- Habitat:** Collected from coarse sand mixed with shells, muddy detrital sand, fine well-sorted sand mixed with shell litter in phanerogam meadows, and muddy sand.
- Ecological significance:** Not yet defined.
- Remarks:** Common species in the area studied. At Stupe cove (MLJ-50) one live individual was isolated from the rhizome of *Posidonia oceanica* at 12 m depth.

*Myrtea spinifera* (Montagu, 1803)

- Stations:** MLJ-29, 39, 45, D.
- Depth:** 5–50 m.

- Material: 7 shells (4 paired shells, two measured 10.3/9.4/5.3 and 12.0/10.6/5.9 mm), and 3 valves sized 6.5/5.3 and 9.9/8.6 mm, 1 not measured).
- Habitat: Collected from coarse sand mixed with shell debris, and muddy detrital sand.
- Ecological significance: A species of wide ecological distribution (PICARD, 1965).
- Remarks: Rarely found species in the area surveyed. The shells were noted mostly deeper than 20 m. Shells were collected from muddy detrital sand overgrown by *Osmundaria volubilis* at Tatinica station (MLJ-45). One paired shell was found in the sediment deposited in an empty *Pinna nobilis* shell at Debela punta station (MLJ-39). All collected shells were light orange in colour and dark orange inside the valves.

### THYASIRIDAE Dall, 1900

#### *Thyasira flexuosa* (Montagu, 1803)

- Stations: MLJ-46, 116.
- Depth: 38 and 87 m.
- Material: One paired (5.2/5.7/3.7 mm) and one valve (5.5/6.5 mm).
- Habitat: Collected from muddy detrital sand and sandy mud.
- Ecological significance: Strictly confined to muddy sediments (PICARD, 1965; ZAVODNIK, 1971; HRS-BRENKO, 1997).
- Remarks: Rare species in the area studied. Shells were collected with the hand grab at Kobrava Islet-S (MLJ-46) and with the Van Veen grab at the station MLJ-116. According to Brusina (1907) it is a very rare species in the eastern Adriatic Sea.

#### *Thyasira granulosa* (Monterosato, 1874)

- Stations: MLJ-104, 107.
- Depth: 103 and 104 m.
- Material: One paired shell (6.1/6.4/3.9 mm) and one valve (3.6/4.3 mm).
- Habitat: Collected from muddy sand.
- Ecological significance: Species exclusive to the community of deep muddy bottoms (PICARD, 1965).
- Remarks: Rarely noted in the area surveyed. SOLUSTRI & MICALI (2002) quote the species for Italian part of the central Adriatic sea, sampled with a dredge from muddy sand at 51 m depth.

### UNGULINIDAE Adams H. & A., 1857

#### *Diplodonta brocchii* Deshayes, 1852

- Stations: MLJ-102.
- Depth: 83 m.
- Material: One valve (16.1/14.1 mm).
- Habitat: Collected from sand.



Ecological significance: Not yet defined.

Remark: Very rare in the area surveyed.

*Diplodonta rotundata* (Montagu, 1803)

Stations: MLJ-43.

Depth: 5–10 m.

Material: Two valves (13.0/12.0 and 11.5/10.8 mm).

Habitat: Collected from coarse sand mixed with shells.

Ecological significance: Species living only on muddy bottom (PICARD, 1965).

Remarks: Shells collected in the *Posidonia oceanica* meadow, possibly drifted there from a muddy bottom nearby.

### CHAMIDAE Lamarck, 1809

*Chama gryphoides* Linnaeus, 1758

Stations: MLJ-1, 2, 4, 8, 13, 16, 33, 45, 47, 49, 51–53.

Depth: 0.5–25 m.

Material: Many live individuals recorded by divers: 7 collected and not measured; one paired shell (8.8/9.3/9.1 mm) and 11 right valves collected (5 sized 5.7/7.1–16.1/18.3 mm, 6 not measured).

Habitat: Cemented to rocks and stones covered with algae, noted also in *Cladocora caespitosa* colony.

Ecological significance: Not yet defined (ZAVODNIK, 1971).

Remarks: Common in the community of photophilic algae at Vanji školj islet (MLJ-13). Two specimens were isolated from the biogenic agglomerate at Rastupa Cape (MLJ-51), and one at Procjep station (MLJ-52). Two juvenile right valves (5.7/7.1 and 7.6/8.2 mm) were found between parts of *Cladocora caespitosa* colony at Veli most-N (MLJ-53).

*Pseudochama gryphina* (Lamarck, 1819)

Stations: MLJ- 1, 2, 4–7, 9, 13, 16–18, 20, 22, 23, 27–30, 35, 36, 41, 44, 45, 47, 51–53.

Depth: Infralittoral fringe to 40 m depth.

Material: Many live individuals and empty shells observed by divers; 1 live specimen (23.7/26.6/19.8 mm) and 12 shells collected (6 paired shells sized 18.2/19.3/15.2–36.0/35.1/23.4 mm, 2 not measured, and 6 valves sized 2.8/10.2–21.9/20.8 mm, 3 not measured).

Habitat: Attached to stones and rocks, sometimes clustered.

Ecological significance: A species of the community of photophilic algae (PÈRES & PICARD, 1964).

Remarks: Commonly noted in the investigated area. At Glavat Cape (MLJ-30), a few isolated specimens were noted at the infralittoral fringe. At Sv. Marija islet (MLJ-4) on flat rocks at about 0.2 m depth 14 individuals/1m<sup>2</sup> were counted. Two shells were isolated from clusters at the Lenga Cape (MLJ-16) and at Veli most-N (MLJ-53). At MLJ-9 specimens were noted with other bivalve species (*Modiolus barbatus*,

*Gastrochaena dubia*, and *Chlamys varia*) in cluster formations dispersed on muddy sand covered with shell debris.

### GALEOMMATIDAE Gray, 1840

*Galeomma turtoni* Sowerby G.B.I in Turton, 1825

Stations: MLJ-28, 30.

Depth: 10–20 m.

Material: 3 live individuals (sized 7.4/3.8/3.2 and 8.0/4.0/3.5 mm, 1 not measured).

Habitat: Free crawling species on the sand in the *Posidonia oceanica* meadows.

Ecological significance: Not defined.

Remarks: According to PARENZAN (1974) and SALVINI-PLAWEN (1991) it is relatively rare in the Mediterranean Sea. All collected individuals were white in colour and collected in sand mixed with molluscan shells.

### KELLIIDAE Forbes & Hanley, 1849

*Kellia suborbicularis* (Montagu, 1803) (Fig. 9.)

Stations: MLJ-9, 14, 47, 51, 53, 54, 103.

Depth: 9–49 m.

Material: 7 live individuals (sized 2.9/2.4/1.6–10.2/9.1/6.2 mm) and 4 paired shells (sized 3.1/2.7/1.8–5.8/5.3/3.3 mm).

Habitat: Collected from the rocks and stones covered with algae, in interspaces of coral colony, and from the sandy deposit.

Ecological significance: Not yet defined.

Remarks: Live individuals were collected at Štit islet (MLJ-14) among photophilic algae, at Kula islet (MLJ-47) and Rastupa Cape (MLJ-51) in the coralligenous community, at Velika Priježba (MLJ-9) in detrital bottom, and at the MLJ-103 station in sand. At Veli most-N (MLJ-53) two shells were isolated from the interspaces of the big *Cladocora caespitosa* colony.

### LASAEIDAE Gray, 1847

*Lasaea rubra* (Montagu, 1803)

Stations: MLJ-15.

Depth: Infralittoral fringe at about 0.5 m depth.

Material: One live individual collected but not measured.

Habitat: Rock crevice.

Ecological significance: A species of the mediolittoral community (BELLAN-SANTINI, 1969).

Remarks: Mostly recorded in tidal zone (PARENZAN, 1974; POPPE & GOTO, 1993; HRS-BRENKO, 1997). According to BRUSINA (1907) it is widely distributed, but not easy to find due to its small size. Live individual light red in colour was collected in the community of photophilic algae.

**CARDITIDAE Fleming, 1828***Glans aculeata* (Poli, 1795)

Stations: MLJ-102, 112, C.

Depth: 60–83 m.

Material: 1 live individual (18.5/18.1/13.4 mm) and 6 valves (sized 11.2/10.9–18.0/17.2 mm).

Habitat: Collected from sand rich in shells, and detrital sand.

Ecological significance: Species preferential for the community of coastal detrital bottom (GAMULIN-BRIDA, 1974).

Remarks: Rarely noted in the area surveyed. According to PARENZAN (1974) it is not common in the Mediterranean. Live individual was collected at the station MLJ-112.

*Glans trapezia* (Linnaeus, 1767)

Stations: MLJ-4, 6, 9, 12, 16, 21, 27, 29, 36, 39, 43, 45, 50, 52, 53.

Depth: 0.5–30 m.

Material: 8 live individuals (2 measured 5.3/4.7/3.7 and 9.4/8.4/6.3 mm) and 23 shells (6 paired shells, two 8.6/7.7/6.2 and 9.1/8.0/6.2 mm, and 17 valves sized 3.2/3.0–8.0/6.5 mm, 6 not measured).

Habitat: Collected from the rocks covered with algae, sand in *Posidonia oceanica* meadows, coarse sand mixed with shells, muddy detrital sand, and biogenic clusters.

Ecological significance: Species exclusive to the community of *Posidonia oceanica* meadows (PICARD, 1965).

Remarks: Live individuals were collected from the rocks in the community of photophilic algae at Babine kuće (MLJ-6), Procijep cove (MLJ-52) and Veli most-N (MLJ-53), and from the coarse sand mixed with shells at Pračarica (MLJ-4), Velika priježba (MLJ-9) and Stupe cove (MLJ-50). At Podvrti station (MLJ-36) one live individual was collected from the muddy detrital sand in the community of coastal detrital bottom.

**ASTARTIDAE d'Orbigny, 1844***Astarte sulcata* (da Costa, 1778)

Stations: MLJ-101.

Depth: 60 m.

Material: One valve (4.1/3.6 mm).

Habitat: Collected from sand with *Spongites fruticulosus* fragments.

Ecological significance: Species exclusive to the community of offshore detrital bottom (PICARD, 1965)

Remarks: Very rare in the area studied. Collected shell was brown-orange in colour.

**CARDIIDAE Lamarck, 1809***Acanthocardia echinata* (Linnaeus, 1758)

Stations: MLJ-104, 109, 112, 121, A, D, K1.

Depth: 50–120 m.

Material: One paired shell (31.3/32.1/26.2 mm) and 12 valves (sized 5.6/5.3–42.2/38.6 mm, 1 not measured).

Habitat: Collected from sand, muddy sand, muddy sand mixed with bivalvian shells, and terrigenous ooze.

Ecological significance: Not yet defined (PICARD, 1965; GAMULIN-BRIDA, 1974).

Remarks: Noted only in deeper areas of the National Park.

*Acanthocardia paucicostata* (Sowerby G.B.II, 1841)

Stations: MLJ-6-9, 24, 25.

Depth: 0.5–30 m.

Material: Many shells observed by divers; one live individual (not measured) and 12 shells collected (5 paired shells sized 23.2/21.4/16.9–30.6/29.5/24.6 mm and 7 valves sized 14.8/14.1–43.2/36.7 mm).

Habitat: Collected from gravel, coarse sand and muddy sand mixed with shell debris.

Ecological significance: Species tolerant to silt fractions and preferring the community of terrigenous ooze (PÉRÈS & PICARD, 1964; PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974).

Remarks: Both old and recent shells were very frequent in the area of Malo jezero, at Velika Priježba (MLJ-9) and Glavica od mosta (MLJ-25), especially at depths greater than 10 m, on muddy sand in the community of coastal detrital bottom. Shells were also common in the Veliko jezero inlet. The live individual was noted at Velika Priježba (MLJ-9).

*Acanthocardia tuberculata* (Linnaeus, 1758)

Stations: MLJ-23, 26, 30.

Depth: 1–30 m.

Material: 3 shells collected (2 paired shells, one 42.8/42.6/36.1 mm, other not measured, and 1 valve 40.5/40.6 mm).

Habitat: Collected from sand and sand mixed with broken shells.

Ecological significance: Species exclusive to the community of fine well-calibrated sand (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Rarely recorded in the area surveyed.

*Parvicardium exiguum* (Gmelin, 1791)

Stations: MLJ-2, 6-8, 15, 16, 21, 24, 27, 36, 38–40, 44, 45, D.

Depth: 0.5–57 m.

**Material:** 3 live individuals (sized 3.4/3.3/2.4–8.4/8.6/6.2 mm) and 19 shells (2 paired shells, one 12.9/13.5/9.8, other not measured, and 17 valves sized 3.5/3.9–14.0/14.9 mm).

**Habitat:** Collected from sand with gravel, coarse sand mixed with shells, muddy detrital sand, and sand in marine phanerogams meadows.

**Ecological significance:** A pollution indicator species (PICARD, 1965; ZAVODNIK, 1971).

**Remarks:** Common species in the area studied. Live individuals were found at Debela punta station (MLJ-39) in the *Posidonia oceanica* meadows and among the other mollusc species collected from an old trammel bottom net lost at MLJ-D station. A significant number of shells have been observed in the sediments of *Posidonia oceanica* meadows at Lokva cove (MLJ-27) and Rat Lenga (MLJ-40). VULETIĆ (1953) noted the species at Malo Jezero as *Cardium subangulatum*.

#### *Parvicardium minimum* (Philippi, 1836)

**Stations:** MLJ-102, 103, 109, 112–114, 118–120, B.

**Depth:** 39–102 m.

**Material:** 4 live individuals (sized 1.3/1.3/0.8–4.5/4.5/3.1 mm) and 13 shells (2 paired shells sized 1.3/1.3/0.8 and 3.9/3.7/2.7 mm, and 11 valves sized 1.3/1.3–5.8/5.8 mm).

**Habitat:** Collected from sand mixed with shells, sand mixed with *Lithothamnion* debris, and muddy sand mixed with bivalve shells.

**Ecological significance:** A mixed bottom species (PICARD, 1965; HRS-BRENKO, 1997).

**Remarks:** Rarely noted in the studied area, only in the deeper parts. Live individuals were encountered at the MLJ-103 and 118 stations.

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

**Stations:** MLJ-2, 3, 6, 9, 14–16, 21, 22, 25, 27–30, 32, 36, 38–49, 51–54, 57, 103, 113, D.

**Depth:** 1–68 m.

**Material:** 19 live individuals (sized 2.4/2.5/1.4–14.1/13.9/10.5 mm, 2 not measured) and 45 shells collected (24 paired shells sized 6.2/5.9/4.6–19.4/19.0/13.7 mm, 8 not measured, and 21 valves sized 6.3/6.2–17.5/16.0 mm, 14 not measured). Many more shells noted by divers but not collected.

**Habitat:** Collected from rocks covered with algae, coarse and muddy sand mixed with shells, sand between loose stones, sand mixed with *Lithothamnion* debris, muddy detrital bottom, sand in *Posidonia oceanica* meadows, mollusc clusters, from sediment deposited in bivalve shell and among corals.

**Ecological significance:** A species of wide ecological distribution, preferring communities of coastal detrital bottoms and of coastal detrital bottoms partly mixed with ooze (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

**Remarks:** Common species in the area surveyed. Live specimens were rarely found but a great number of shells were noted elsewhere. Three live

individuals were collected from muddy sand mixed with shell debris at Glavica od mosta (MLJ-25), Podvrti (MLJ-36) and Tatinica station (MLJ-45), two from sand mixed with shells and *Lithothamnion* debris at the MLJ-103 and MLJ-113, two from sediment in *Posidonia oceanica* at Tatinica station and Sikjerica Cape (MLJ-22). Two juveniles were removed from big *Cladocora caespitosa* colony at Veli most-N (MLJ-53) and collected from sand in *Posidonia oceanica* meadow (2.6 and 2.4 mm in length, respectively) at Tijesno station (MLJ-41). Between the collected shells the biggest 5 were 17–19 mm long, i.e. a few millimetres longer than noted for the species by POPPE & GOTO (1993), NORDSIECK (1969) and PARENZAN (1974).

*Laevicardium crassum* (Gmelin, 1791)

Stations: MLJ-2, 30, 41, 42, 44, 48, 49, 52, 53.

Depth: 5–45 m.

Material: 1 live individual (6.2/5.7/3.8 mm) and 10 shells (9 paired shells sized 8.6/8.7/5.4–26.2/29.7/17.8 mm, 6 not measured, and 1 valve sized 20.7/22.1 mm).

Habitat: Collected from coarse sand mixed with shells, and in *Posidonia oceanica* meadow.

Ecological significance: Species preferential for the community of rough sands and fine gravel under the influence of bottom currents, also accompanied in communities noted on other types of gravel sediments (PICARD, 1965).

Remarks: One live juvenile was found at Ovrata Islet-N (MLJ-42) on the sediment accumulated on a rocky step of a typical underwater cliff. The majority of collected shells were found deeper than 15 m.

*Laevicardium oblongum* (Gmelin, 1791)

Stations: MLJ-22, 30, 41, 45, 46, 48, 53, A, D, K1.

Depth: 5–120 m.

Material: 8 paired shells (two measured 38.9/45.8/28.3 and 47.0/55.4/34.0 mm) and 2 valves (43.1/55.0 mm, 1 not measured).

Habitat: Collected from coarse, well sorted and muddy sand mixed with shell litter, sand in *Posidonia oceanica* meadows, and terrigenous ooze.

Ecological significance: An exclusive species to the community of coastal detrital bottoms (PÉRÈS & PICARD, 1964; PICARD, 1965; GAMULIN-BRIDA, 1974).

Remarks: Collected shells were mostly old and eroded.

*Cerastoderma glaucum* (Poiret, 1789)

Stations: MLJ-1, 8, 25.

Depth: 0.5–15 m.

Material: Many shells observed by divers, 6 collected (2 paired shells, one measured 15.8/13.0/10.2 mm, 4 valves sized 23.6/23.2–40.3/38.3 mm).

Habitat: Observed and collected from sand mixed with gravel, coarse to muddy sand mixed with bivalve shells, and from a cluster of molluscs on the sandy deposit.

Ecological significance: An exclusive species to the community of euryhaline and eurytherme lagoons (PICARD, 1965).

Remarks: Many old and broken shells were noted in the Malo jezero inlet at MLJ-25 where between the depths of 10 and 15 m the muddy sand was completely covered by *Cerastoderma glaucum* and diverse bivalve shells.

### TELLINIDAE de Blainville, 1814

#### *Tellina donacina* Linnaeus, 1758

Stations: MLJ-1, 25, 27, 28, 36, 39, 43, 46.

Depth: 2–25 m.

Material: 13 shells (5 paired shells sized 10.5/5.6/2.7–16.7/9.5/4.9 mm, 1 not measured, and 8 valves sized 10.3/5.7–15.7/8.9 mm, 1 not measured).

Habitat: Collected from coarse sand mixed with shells, sand in *Cymodocea nodosa* meadow, and muddy detrital sand.

Ecological significance: Species exclusive to the communities of coastal detrital bottoms and of coastal detrital bottom partly mixed with ooze (PÉRÈS & PICARD, 1964; PICARD, 1965; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remark: A few shells were collected on muddy detrital sand at Glavica od mosta (MLJ-25).

#### *Tellina pulchella* Lamarck, 1818

Stations: MLJ-24, 25, 26.

Depth: 1–15 m.

Material: 3 paired shells not measured.

Habitat: Collected from coarse sand mixed with shells in *Cymodocea nodosa* beds, and muddy detrital sand.

Ecological significance: Species exclusive to the community of fine well-calibrated sand (PÉRÈS & PICARD, 1964; PICARD, 1965; GAMULIN-BRIDA, 1974).

Remark: Shells were collected from muddy detrital sand at Glavica od mosta (MLJ-25) and in the community of *Cymodocea nodosa* at cove Pod Mala Poma cove (MLJ-24).

#### *Tellina serrata* Brocchi, 1814

Stations: MLJ-46, 102, 103, 112, 120.

Depth: 10–83 m.

Material: 3 live individuals (sized 5.1/3.7/1.4–31.0/22.1/9.2 mm) and 6 shells (1 paired shell 23.6/16.6/6.4 mm and 5 valves sized 10.9/7.7–24.0/16.8 mm, 1 not measured).

Habitat: Collected from sand, sand mixed with shells, and muddy sand mixed with shell debris.

Ecological significance: Species exclusive to the community of muddy detrital bottoms (PÉRÈS & PICARD, 1964; PICARD, 1965).

Remarks: Rarely found in the investigated area. Live individuals were encountered at MLJ-103 in sand mixed with shells at a depth of 49 m and at MLJ-120 in muddy sand at a depth of 39 m.

*Arcopagia balaustina* (Linneaus, 1758)

Stations: MLJ-3, 29, 31, 36, 39–41, 43–47, 50, 57, 102, 113.

Depth: 1–83 m.

Material: 3 live individuals (one 7.6/6.2/3.1 and 2 not measured) and 20 shells (12 paired shells sized 14.1/11.9/6.8–19.0/15.1/9.1 mm, 7 not measured, and 8 valves sized 11.4/9.2–16.4/13.5 mm, 3 not measured).

Habitat: Collected from sand mixed with shells, muddy detrital sand, sand in *Posidonia oceanica* meadows usually between loose stones, and sand mixed with *Lithothamnion* debris.

Ecological significance: A mixed bottom species preferring the communities of coastal detrital bottoms and of detrital bottom of the open insular zone and open sea (PICARD, 1965; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Common species in the investigated area. Live individuals were collected from the sediment accumulated in an old shell of *Pinna nobilis* at Debela punta (MLJ-39), removed from the rhizome of *Posidonia oceanica* at Rat Lenga (MLJ-40) while the smallest one (7.6/6.2/3.1) was extracted from the sand mixed with *Lithothamnion* debris at MLJ-113.

*Arcopagia crassa* Pennant, 1777

Stations: MLJ-45.

Depth: 1–10 m.

Material: 3 shells (1 paired shell 11.4/9.3/4.9 mm, and 2 valves: 15.2/12.8 and 13.6/11.3 mm).

Habitat: Collected from coarse sand mixed with shells.

Ecological significance: Species exclusive to the community of coarse sands and fine gravel under the influence of bottom currents (PÉRÈS & PICARD, 1964; PICARD, 1965).

Remark: Rare species in the area studied.

*Gastrana fragilis* (Linnaeus, 1758)

Stations: MLJ-1, 11, 21, 36, 38.

Depth: 0–10 m.

Material: 2 live individuals (27.5/19.2/13.1 and 31.1/21.4/12.9 mm) and 7 shells (5 paired shells sized 13.0/11.2/6.5–31.1/21.8/13.1 mm, and 2 valves sized 18.2/13.5 and 27.0/21.2 mm).

Habitat: Collected from sand in *Posidonia oceanica* meadow, and coarse and muddy sand mixed with shell debris.

Ecological significance: A species noted in the community of muddy sands of calm mode (PÉRÈS & PICARD, 1964).



Remarks: Rare species in the area surveyed. Live individuals were collected from sand in *Posidonia oceanica* meadow at Pomena cove (MLJ-21) and coarse sand mixed with shells at Solinski kanal station (MLJ-1).

### PSAMMOBIIDAE Fleming, 1828

*Gari costulata* (Turton, 1822)

Stations: MLJ-28, 42.

Depth: 10–43 m.

Material: 1 live individual (14.0/7.2/3.0 mm) and 2 valves (15.9/8.1 and 16.3/8.2 mm).

Habitat: Collected from sand mixed with shells.

Ecological significance: Species exclusive to the community of coarse sands and fine gravel under the influence of bottom currents (PÉRÈS & PICARD, 1964; PICARD, 1965).

Remarks: Rare species in the area studied, and in general in the Adriatic Sea, as stated by BRUSINA (1907). The live individual was collected at Ovrata Islet-N (MLJ-42) from coarse sand at a depth of 43 m.

*Gari depressa* (Pennant, 1777)

Stations: MLJ-6, 22, 23, 27, 32, 36, 39, 41, 43, 45, 49, 53, 58.

Depth: 1–30 m.

Material: 15 paired shells (sized 21.5/11.4/5.2–43.0/22.0/12.1 mm, 9 not measured).

Habitat: Collected from sandy sediments in *Posidonia oceanica* beds and sand mixed with shell litter.

Ecological significance: Species exclusive to the community of phanerogam meadows (PICARD, 1965).

Remarks: Common species in the area surveyed. At Debela punta (MLJ-39) one shell was sampled from the sediment accumulated in an old *Pinna nobilis* shell. At MLJ-22, 23, 27, 32, 41, and 43 shells were collected from deposit in *Posidonia oceanica* beds.

### SEMELIDAE Stoliczka, 1870 (1850)

*Abra alba* (Wood W., 1802)

Stations: MLJ-38, 102, 104–107, 109, 113, 121.

Depth: 2–107 m.

Material: 20 shells (2 paired shells 10.2/7.0/4.8 and 12.6/8.5/5.0 mm, and 18 valves sized 8.6/5.5–17.4/11.9 mm, 7 not measured).

Habitat: Sampled from muddy sand mixed with shell debris and bivalve shells, sand mixed with shells and with *Lithothamnion* debris, and muddy sand mixed with bryozoan debris.

Ecological significance: A mud-tolerant species occurring in the communities of fine well-calibrated sand and of coastal terrigenous ooze (PICARD, 1965; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remark: Common species in deeper zones of the studied area.

*Abra nitida* (Müller O.F., 1776)

Station: MLJ-105.

Depth: 107 m.

Material: One valve (7.4/4.4 mm).

Habitat: Sampled from muddy sand.

Ecological significance: Species exclusive to the community of coastal terrigenous ooze (PICARD, 1965).

Remark: Rare in the area investigated.

*Abra prismatica* (Montagu, 1808)

Stations: MLJ-102, 103, 112.

Depth: 49–83 m.

Material: 2 live individuals (8.5/4.5/2.4 and 10.0/4.9/2.9 mm) and 3 valves (sized 7.0/3.7–11.3/6.1 mm).

Habitat: Sampled from sand and sand mixed with shells.

Ecological significance: A mud-tolerant species exclusive to the community of coastal detrital bottom (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974).

Remark: Perhaps rare in the area studied.

### SOLECURTIDAE d'Orbigny, 1846

*Azorinus chamasolen* (da Costa, 1778)

Stations: MLJ-7, 9, 25, 58, 102, 104, 109.

Depth: 1–15, 83–104 m.

Material: 16 shells (8 paired shells sized 12.8/5.9/2.6–35.1/16.0/9.1 mm and 8 valves sized 15.3/7.0–40.2/19.3 mm).

Habitat: Collected from sand with shells, and muddy detrital sand.

Ecological significance: Not known.

Remark: The largest shells were found among large number of shells covering muddy sand at MLJ-25 and MLJ-9 in the Malo jezero inlet.

### TRAPEZIDAE Lamy, 1920

*Coralliophaga lithophagella* (Lamarck, 1819)

Stations: MLJ-41, 42, 47, 49, 51, 53.

Depth: 9–43 m.

- Material:** 2 live individuals (7.6/5.1/2.9 and 15.4/7.9/6.2 mm) and 5 shells (2 paired shells 8.4/6.7/3.2 and 8.8/6.8/3.5 mm and 3 valves 6.4/5.4, 7.2/4.5 and 16.8/11.5 mm).
- Habitat:** Collected from rocks covered with photophilic algae, biotic agglomeration and among corals.
- Ecological significance:** Not yet defined.
- Remarks:** According to POPPE & GOTO (1993) and PARENZAN (1974) the species lives on and in colonies of corals. One live individual was isolated among fragments of a *Cladocora caespitosa* colony at Veli Most-N (MLJ-53) and the other one was collected from rock covered with photophilic algae at Tijesno station (MLJ-41). A similar occurrence was noted in Boka Kotorska bay by PARENZAN (1974). The shells of all specimens were light yellow in colour with brown spot around umbones. Collected specimens varied in shell morphology (Fig. 10a, 10b).

### GLOSSIDAE Gray, 1847

#### *Glossus humanus* (Linnaeus, 1758)

- Stations:** MLJ-23, A, K1.
- Depth:** 5–120 m.
- Material:** 4 valves (sized 40.8/42.2–57.2/61.0 mm, 1 not measured).
- Habitat:** Collected from coarse sand, muddy sand, and terrigenous ooze.
- Ecological significance:** Not known.
- Remark:** Rare in the area studied.

### VENERIDAE Rafinesque, 1815

#### *Venus casina* Linnaeus, 1758

- Stations:** MLJ-48.
- Depth:** 30–40 m.
- Material:** 1 paired shell (23.6/18.6/12.3 mm).
- Habitat:** Collected from sand in *Posidonia oceanica* beds.
- Ecological significance:** Species exclusive to the community of rough sands and fine gravel under the influence of bottom currents, and accompanying species in the community of coastal detrital bottoms that indicates the presence of steady bottom currents (PÈRES & PICARD, 1964; PICARD, 1965; GAMULIN-BRIDA, 1974).
- Remarks:** The shell collected at Vela Tatinica Cove (MLJ-48) from *P. oceanica* bed was dirty white in colour with light red radial lines (Fig. 11.). BRUSINA (1907) considered it a rare species in the eastern Adriatic Sea.

#### *Venus verrucosa* Linnaeus, 1758

- Stations:** MLJ- 1–9, 13, 21–25, 27, 29, 30, 32, 35, 36, 38–50, 52–54, 57–59, 61.
- Depth:** 0–40 m.

- Material:** 5 live individuals (not measured) and 15 shells (6 paired shells sized 14.6/12.3/8.2–37.3/38.0/21.4 mm, 2 not measured, and 9 valves sized 5.2/4.6–37.3/33.3 mm). Many shells recorded by divers, but not collected.
- Habitat:** Observed and collected from sand in phanerogam meadows, gravel, sand mixed with shells, muddy sand mixed with shell litter, and from the sponge *Cacospongia* sp.
- Ecological significance:** A species occurring in the community of phanerogam meadows (PÉRÈS & PICARD, 1964; PICARD, 1965; HRS-BRENKO, 1997).
- Remarks:** One of the most frequently noted shells in the area studied. Live individuals were observed rarely by divers and only 5 were collected at Solinski kanal station (MLJ-1), Sladingradac (MLJ-3), Sv. Marija Islet (MLJ-5), and at Tatinica station (MLJ-45). Many shells were noted in *Posidonia oceanica* beds at stations MLJ-22, 23, 27, 32, 44, 47, 57, and in *Cymodocea nodosa* beds at MLJ-5, 7, 24, 25.

*Globivenus effosa* (Philippi, 1836)

- Station:** MLJ-49.
- Depth:** 45 m.
- Material:** One valve (16.6/14.6 mm).
- Habitat:** Collected from muddy sand with shells.
- Ecological significance:** An accompanying species with an undefined ecological significance (PICARD, 1965).
- Remarks:** Only once recorded in the area surveyed. According to POPPE & GOTO (1993) *G. effosa* is one of the rarest and most sought-after species from the family *Veneridae* of the Mediterranean. The colour of the shell studied is dirty white with brown stains (Fig. 12.).

*Clausinella fasciata* (da Costa, 1778)

- Stations:** MLJ-45, D, 112.
- Depth:** 20–70 m.
- Material:** 1 paired shell (12.3/11.4/7.1 mm) and 3 valves (8.3/7.6–13.9/12.8 mm).
- Habitat:** Collected from sand, muddy sand, and muddy sand mixed with shell debris.
- Ecological significance:** A species occurring in the community of coastal detrital bottom (PÉRÈS & PICARD, 1964).
- Remarks:** Rarely found species in the area studied. At MLJ-D station shell was collected from the old bottom net among other mollusc shells and live individuals. The colour of the shells collected at MLJ-112 station was dirty white with light purple radial lines. The species was also recorded in Mali Ston Bay (PEHARDA, 2003).

*Timoclea ovata* (Pennant, 1777)

- Stations:** MLJ-15, 39, 43, 44, 46, 51, 101–104, 106, 107, 109, 112, 113, 116, 118, 119, 121, B, C, D.

- Depth: 20–104 m.
- Material: 15 live individuals (11 juveniles sized 0.9/0.9/0.5–1.9/1.8/1.0 mm, 3 not measured and 4 adults sized 4.8/4.4/2.4–10.3/8.3/5.0 mm) and 78 shells (13 paired shells sized 2.0/1.9/0.5–10.0/8.4/5.5 mm and 65 valves sized 1.7/1.6–11.5/9.8 mm, 10 not measured).
- Habitat: Collected from sand mixed with shells, sand in *Posidonia oceanica* beds, muddy detrital sand, sand mixed with *Spongites fruticosus* and *Lithothamnion* debris, silty sand with bryozoan debris and bivalvian shells, and from biogenic cluster.
- Ecological significance: A mixed bottom species (PICARD, 1965; ZAVODNIK, 1971; HRS-BRENKO, 1997) occurring in the community of the detrital bottom of the open insular zone and open sea (GAMULIN-BRIDA, 1974).
- Remarks: Noted mostly on the northern part and in deeper zones of the southern part of National Park. Live individuals were collected from sand in *P. oceanica* bed at Debela Ponta (MLJ-39), sand mixed with shells at Kobrava Islet-N (MLJ-44), and silty sand at MLJ-D, 112, 116, 118 and 119 stations. All juvenile specimens were sampled with the Van Veen grab. Collected individuals varied in colour from dirty white, dirty white with brown and orange spots to white with purple spots.

*Gouldia minima* (Montagu, 1803)

- Stations: MLJ-1-4, 7, 9, 16, 22, 25, 27, 30, 36, 38, 39, 42–48, 51–53, D, 103.
- Depth: 1–57 m.
- Material: 5 live individuals (sized 7.2/6.6/3.2–12.4/10.9/5.4 mm, 2 not measured) and 66 shells (11 paired shells sized 5.0/4.7/2.2–17.1/15.0/7.9 mm, 7 not measured, and 55 valves sized 2.6/1.7–16.6/15.0 mm, 19 not measured).
- Habitat: Collected from coarse sand mixed with shell litter, sand in *Posidonia oceanica* beds, muddy sand mixed with shell debris, mud mixed with *Lithothamnion* debris, biogenic cluster with algae *Cystoseira* sp., rocks covered with algae, and from *Cladocora caespitosa* colony.
- Ecological significance: Species living on gravelly deposit but tolerating sandy fraction (PICARD, 1965; ZAVODNIK, 1971; HRS-BRENKO, 1997).
- Remarks: Common species in the area studied. Its shells were often encountered in various types of sediment. Live individuals were collected from coarse sand mixed with shell litter at Solinski kanal station (MLJ-1), at Glavat Cape (MLJ-30) and at Podvrti station (MLJ-36), from muddy sand at MLJ-D station, and from mud mixed with *Lithothamnion* debris at Veli most-N (MLJ-53). At Ovrata Islet-W (MLJ-43) shells varied very much in colour: one yellow empty shell with brown zigzag concentric lines also was collected.

*Dosinia exoleta* (Linnaeus, 1758)

- Stations: MLJ-39.
- Depth: 2–10 m.
- Material: 3 paired shells (sized 17.2/15.9/9.1–22.6/20.7/11.0 mm).

Habitat: Collected from coarse sand mixed with shells, sparsely overgrown by *Cymodocea nodosa*.

Ecological significance: Species exclusive to the community of rough sands and fine gravel under the influence of bottom currents (PÉRÈS & PICARD, 1964; PICARD, 1965; GAMULIN-BRIDA, 1974).

Remarks: Rarely found in the area surveyed. Noted also in Mali Ston Bay (PEHARDA, 2003).

*Pitar rudis* (Poli, 1795)

Stations: MLJ- 22, 25, 27, 32, 35, 38, 39, 41, 45, 46, 48, 50, 104, 106, 109, 112, 113, 118, C, D.

Depth: 1–104 m.

Material: 2 live individuals (8.9/8.1/5.2 and 14.1/13.1/9.7 mm) and 27 shells (10 paired shells sized 5.4/5.0/3.0–22.3/19.5/13.9 mm, 6 not measured, and 17 valves sized 6.5/5.8–17.8/14.1 mm, 3 not measured).

Habitat: Collected from sand and muddy detrital sand, molluscan cluster on muddy sand, empty *Pinna nobilis* shell, silty sand mixed with bryozoan debris, and muddy sand with bivalve shells.

Ecological significance: A species of wide ecological distribution preferring the community of coastal detrital bottoms (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Common species in the area studied. Live individuals were collected from sand at MLJ-112 and from sand mixed with *Lithothamnion* debris at MLJ-113.

*Callista chione* (Linnaeus, 1758)

Stations: MLJ-30, 31, 39, 41, 44, 59.

Depth: 1–40 m.

Material: 7 paired shells (sized 28.5/21.4/12.0–65.4/52.6/33.5 mm).

Habitat: Collected from sand mixed with shell litter, and sand between loose stones and outcrops.

Ecological significance: A species with a still undefined ecological significance (PICARD, 1965; ZAVODNIK, 1971).

Remarks: Rarely found in the investigated area. Shells were mostly noted below the 15 meters mark.

*Tapes decussatus* (Linnaeus, 1758)

Stations: MLJ-1, 61.

Depth: 0.2 m.

Material: 3 paired shells (sized 15.8/12.4/7.6–24.7/18.3/12.3 mm).

Habitat: Collected from sand.

Ecological significance: Species exclusive to the community of silty sediments of calm modes (PÉRÈS & PICARD, 1964; PICARD, 1965; GAMULIN-BRIDA, 1974).

Remark: Extremely rarely found in all stations, probably due to lack of species typical habitat at stations surveyed.

*Venerupis aurea* (Gmelin, 1791)

Stations: MLJ-1, 4, 16.

Depth: 0.2–20 m.

Material: 3 paired shells (18.5/13.6/8.8 and 19.8/12.9/9.2 mm, 1 not measured).

Habitat: Collected from coarse sand mixed with shells.

Ecological significance: Species exclusive to the community of silty sediments of the calm mode (PICARD, 1965; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remark: Collected shells varied in colour from light yellow, greenish to brown with brown or yellow lines and spots.

*Venerupis rhomboides* (Pennant, 1777)

Stations: MLJ-7, 27, 29.

Depth: 5–10 m.

Material: 3 paired shells (17.6/13.6/8.5 and 23.3/15.6/9.9 mm, 1 not measured).

Habitat: Collected from sand mixed with shells.

Ecological significance: Species exclusive to the community of rough sands and fine gravel under the influence of bottom currents (PICARD, 1965).

Remark: Not common in the area studied.

*Venerupis pullastra* (Montagu, 1803)

Stations: MLJ-27, 30, 44, 46, 48, 50, 53.

Depth: 2–35 m.

Material: 13 shells (8 paired shells sized 15.0/9.9/4.9–29.8/18.8/12.3 mm and 5 valves sized 18.7/12.2–29.7/19.0 mm, 1 not measured).

Habitat: Collected from sand mixed with shells, muddy detrital sand, and rocks Covered with photophilic algae.

Ecological significance: Species exclusive to the community of marine phanerogam meadows (PICARD, 1965).

Remark: Common species in the area surveyed.

**PETRICOLIDAE Deshayes, 1839***Petricola lithophaga* (Philippson, 1788)

Stations: MLJ-8, 9, 25, 34.

Depth: 0.2–5 m.

Material: One live individual observed, not collected and not measured; 10 shells (4 paired shells sized 10.3/8.0/5.3–16.0/11.5/8.3 mm, and 6 valves, one measured 16.8/11.7 mm).

Habitat: Observed in rock and collected from stones.

Ecological significance: Not yet defined.

Remarks: Rarely recorded in the area of research. A live individual was noted at Goli rat (MLJ-34) in the community of photophilic algae. Old shells collected from the stones at Mali most (MLJ-8) were dirty white to

greenish in colour. Collected shells slightly varied in shell morphology (Fig. 13a., 13b.).

*Lajonkairia lajonkairii* (Payraudeau, 1826)

Stations: MLJ-36.

Depth: 5–10 m.

Material: 3 valves (sized 5.5/4.3–23.2/15.6 mm).

Habitat: Collected from sand mixed with shell debris.

Ecological significance: Not yet defined.

Remarks: Very rarely found in the area surveyed (Fig. 14.). Also, according to PARENZAN (1974) this species is not common in the Mediterranean.

*Mysia undata* (Pennant, 1777)

Stations: MLJ-45, 46, 106, 107.

Depth: 20–30, 101–103 m.

Material: 4 valves (sized 16.9/15.6–23.2/22.0 mm).

Habitat: Collected from sand mixed with shells, muddy sand mixed with bryozoan debris, and muddy sand.

Ecological significance: An accompanying species with an undefined ecological significance (PICARD, 1965).

Remarks: Rarely noted in the area studied. Recorded also in Mali Ston Bay (PEHARDA, 2003).

### CORBULIDAE Lamarck, 1818

*Corbula gibba* (Olivi, 1792)

Stations: MLJ-3, 9, 25, 36, 46, 53, 102, 103, 106, 107, 112–114, 116, 118–121, D.

Depth: 5–103 m.

Material: 57 shells (12 paired shells sized 2.6/2.0/1.3–10.9/8.1/5.3 mm, 1 not measured, and 45 valves sized 1.8/1.7–12.3/11.1 mm, 7 not measured).

Habitat: Collected from muddy sand mixed with shell debris, molluscan cluster on sand, sand mixed with shells, and muddy sand mixed with various kinds of debris.

Ecological significance: Species of wide ecological distribution, preferring muddy bottoms (PICARD, 1965; ZAVODNIK, 1971; GAMULIN-BRIDA, 1974; HRS-BRENKO, 1997).

Remarks: Common on muddy bottoms. Juvenile shells were sampled from various sediments at stations MLJ-112, 113, 118, 119, and 120.

### GASTROCHAENIDAE Gray, 1840

*Gastrochaena dubia* (Pennant, 1777)

Stations: MLJ-1, 2, 4, 5, 7–9, 11, 13–25, 28–30, 33–36, 39–54, 57, 59, D.

Depth: From mediolittoral zone down to 50 m deep.

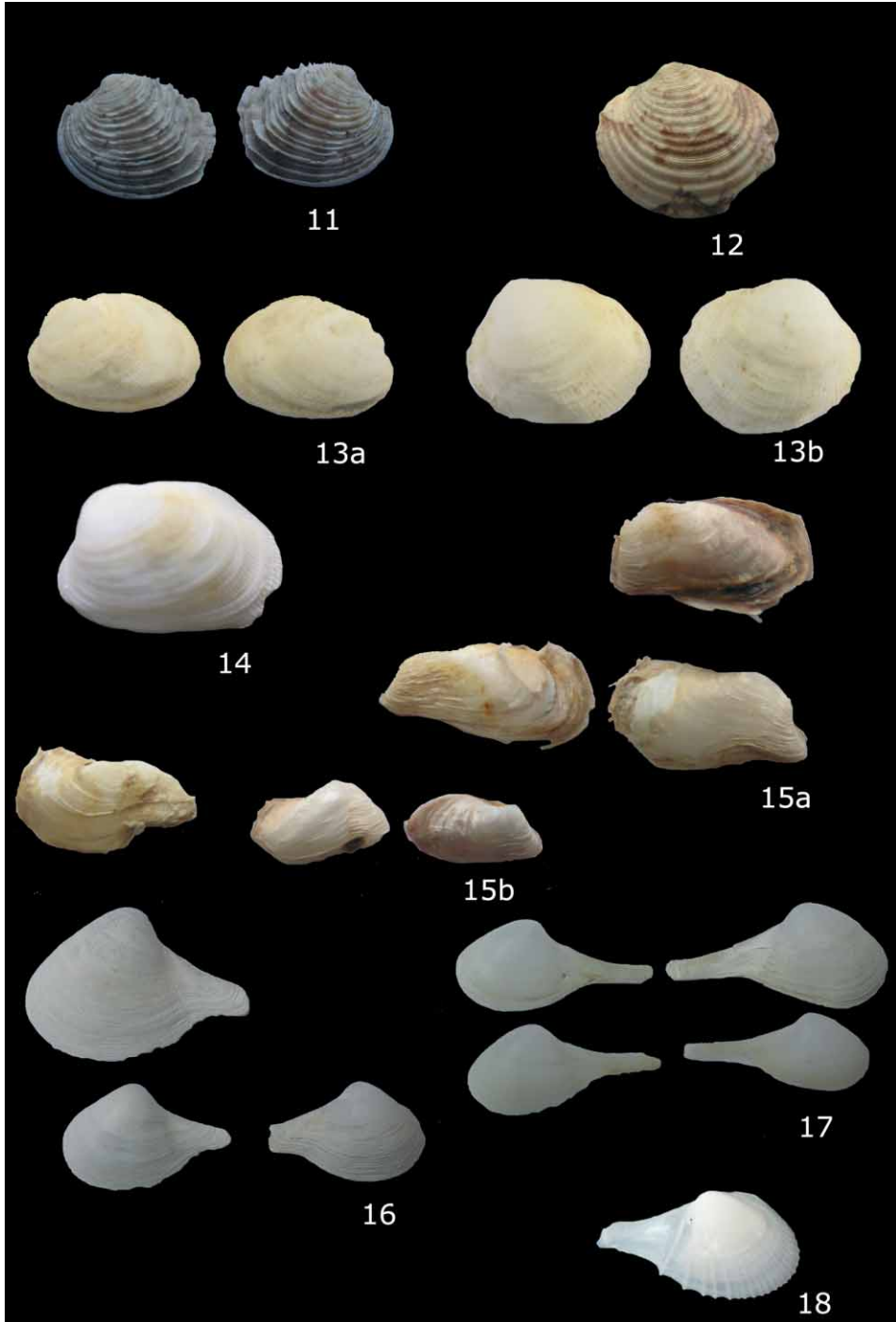


- Material:** 12 live individuals (sized 3.1/6.2/2.9–5.7/12.7/5.4 mm, 4 not measured); many more shells noted by divers, but not collected.
- Habitat:** Observed on rocks covered with algae, stones in phanerogam meadows, and collected from clusters with molluscan shells, and among corals.
- Ecological significance:** Typical endolithic species (ZAVODNIK, 1971; HRS-BRENKO, 1997).
- Remarks:** Along with *Arca noae*, the most frequently encountered bivalve in the area surveyed. In the community of mediolittoral rocks the species was recorded at stations MLJ-8, 19, 29, 33, 34, 36, 47, and 52. *G. dubia* was noted most frequently in the community of photophilic algae and the coralligenous community. It was the dominant species at Lenga Cape (MLJ-16) where 10 individuals/10 cm<sup>2</sup> were counted at 7 m depth. It was also abundant at Kula Islet (MLJ-47) to depth of 5 m and at Vratosolina (MLJ-11), at Za vrti Cove (MLJ-17), and at Glavat Islet (MLJ-28). The juveniles were collected from the old net at MLJ-D station (3.1/6.3/2.9 mm) and from the big *Cladocora caespitosa* colony (3.2/6.5/2.9 mm) at Veli most-N (MLJ-53). One adult specimen was removed from *Spondylus gaederopus* shell at Glavat Cape (MLJ-30). At Kula Islet (MLJ-47) two *G. dubia* were sampled from organogenic clump with *Cystoseira* sp. At Velika Priježba (MLJ-9) and Glavica od mosta (MLJ-25) species was noted in clusters formed with other bivalve species (*Arca noae*, *Modiolus barbatus*, *Pseudochama gryphina*, and *Chlamys varia*) on sand mixed with broken shells in *Cymodocea nodosa* meadows and on muddy sand covered with shell debris.

### HIATELLIDAE Gray, 1824

#### *Hiatella arctica* (Linnaeus, 1767)

- Stations:** MLJ-2, 9, 25, 30, 39, 41, 42, 51, 53, B.
- Depth:** 3–40 m.
- Material:** 32 live individuals (sized 4.6/2.8/2.2–16.6/8.6/7.1 mm, 8 not measured) and 15 shells (13 paired shells sized 4.5/2.3/2.0–6.8/3.2/2.6 mm, 1 not measured, and 2 valves, not measured).
- Habitat:** Attached with byssus to rocks, in rock crevices, clusters, to bivalve shells and various organisms.
- Ecological significance:** Species of wide ecological distribution (PICARD, 1965; ZAVODNIK, 1971; HRS-BRENKO, 1997).
- Remarks:** Common species in the investigated area. Shape variations of shells were noted (Fig. 15a., 15b.). Live individuals were found in unidentified sponges in the community of photophilic algae at Kavalo Cove (MLJ-2) and at Veli most-N (MLJ-53). Three specimens were removed from *Ircinia* sp. in the coralligenous community at Rastupa Cape (MLJ-51). Individuals were noted in molluscan clusters on detrital bottom at Glavica od mosta (MLJ-25) and on *Pecten jacobaeus* shell at Kavalo Cove. One paired shell was found among fragments of *Cellaria fistulosa* colony at MLJ-B station,



and one among fragments of *Cladocora caespitosa* colony at Veli most-N (MLJ-53).

*Hiatella* sp.

Stations: MLJ-9, 36, 39, 44, 46–48, 51, 53, 103, D.

Depth: 5–50 m.

Material: 32 live individuals (sized 1.9/1.1/0.7–9.2/5.4/3.7 mm, 4 not measured) and 9 shells (7 paired shells, one measured 8.4/4.6/3.8 and 2 valves 2.8/1.8 and 14.0/20.4 mm).

Habitat: Collected from rocks, sponges, sand mixed with shells, muddy detrital sand, and from bivalvian shells in muddy sand.

Remarks: Live individuals were sampled from the sponge *Acanthella acuta* in the community of the coastal detrital bottom at Debela punta (MLJ-39), from the sponge *Ircina* sp. in the coralligenous community at Rastupa Cape (MLJ-51), and from rocks in the community of photophilic algae at Kula Islet (MLJ-47) and Rastupa Cape. Many individuals were removed from an old net at MLJ-D station among which 6 were juveniles. One live juvenile specimen (1.9/1.1/0.7 mm) was sampled from sand with shells at MLJ-103. Due to a lack of proper literature sources and comparable voucher material, identification was made only to a genus level.

## TEREDINIDAE Rafinesque, 1815

*Teredo* sp.

Stations: MLJ-2, 7, 58.

Depth: 3 and 9 m.

Material: Shells collected but not measured.

Habitat: Sunken pieces of tree trunks.

Ecological significance: A wood-boring genus.

Remarks: Two pieces of wood with shells collected from the bottoms at stations MLJ-2 and 7, and one sunken stump inhabited by specimens was

⇐ **Plate 2.**

Fig. 11. *Venus casina* (length 23.6 mm). Fig. 12. *Globivenus effosa*, left valve (length 16.6 mm). Fig. 13a. *Petricola lithophaga* (length 10.3 mm) Fig. 13b. *Petricola lithophaga* (length 14.5 mm). Fig. 14. *Lajonkairia lajonkairii*, left valve (length 23.2 mm). Fig. 15a. *Hiatella arctica* (length of left valve 17 mm, lower right valve 16 mm and upper shell 16.2 mm). Fig. 15b. *Hiatella arctica* (length of left valve 16.5 mm, middle shell 12.6 mm and right shell 12.4 mm) Fig. 16. *Cuspidaria cuspidata* (length of upper valve 17.9 mm, lower left valve 13.2 mm and right valve 12.5 mm). Fig. 17. *Cuspidaria rostrata* (length of upper left valve 15.9 mm, lower left valve 16.3 mm, upper right valve 18.9 mm and lower right valve 15.5 mm). Fig. 18. *Cardiomya costellata*, right valve (length 7.3 mm).

observed at MLJ-58. At MLJ-7 the wood was deposited in the *Cymodocea nodosa* bed.

### THRACIIDAE Stoliczka, 1870

#### *Thracia convexa* (W. Wood, 1815)

Stations: MLJ-45, 46.

Depth: 3–25 m.

Material: 3 valves, not measured.

Habitat: Collected from sand mixed with shells and muddy detrital sand.

Ecological significance: Species exclusive to the community of coastal terrigenous ooze (PICARD, 1965).

Remarks: Rarely noted in the area surveyed. Not measured due to the slightly damaged shells.

#### *Thracia corbuloides* Deshayes, 1830

Stations: MLJ-22, 27.

Depth: 5–10 m.

Material: 4 valves (32.4/28.9 and 38.3/28.8 mm, 2 not measured).

Habitat: Collected from sandy deposits in *Posidonia oceanica* beds.

Ecological significance: Species exclusive to the community of *Posidonia oceanica* meadows (PICARD, 1965).

Remarks: Rarely found in the area studied. Collected shells were old and damaged.

#### *Thracia papyracea* (Poli, 1791)

Stations: MLJ-48, 52.

Depth: 12–20 m.

Material: 2 valves (one 17.8/11.4 mm, the other not measured).

Habitat: Collected from coarse sand mixed with shells.

Ecological significance: Species exclusive to the community of fine well-calibrated sand (PÉRÈS & PICARD, 1964; PICARD, 1965; ZAVODNIK, 1971; HRS-BRENKO, 1997).

Remarks: Rarely found in the area investigated. According to SALVINI-PLAWEN (1991) it is a rare species in the Mediterranean Sea.

#### *Thracia villosiuscula* (MacGillivray, 1827)

Station: MLJ-43.

Depth: 8 m.

Material: One valve (6.0/4.8 mm).

Habitat: Collected from coarse sand mixed with shells.

Ecological significance: An exclusive species to the community of rough sands and fine gravel under the influence of bottom currents (PICARD, 1965).

Remark: Only once found in the area of research.

**CUSPIDARIIDAE Dall, 1886***Cuspidaria cuspidata* (Olivi, 1792) (Fig. 16.)

Stations: MLJ-104, 106, 107, 109, 112.

Depth: 70–104 m.

Material: 13 valves (sized 11.1/6.9–19.9/12.4 mm, 3 not measured).

Habitat: Collected from sand, muddy sand mixed with bryozoan debris, and muddy sand mixed with bivalve shells.

Ecological significance: An accompanying species with an as yet undefined ecological significance (PICARD, 1965).

Remark: Common at collection stations.

*Cuspidaria rostrata* (Spengler, 1793)

Stations: MLJ-102, 104–107, 109, 112.

Depth: 70–107 m.

Material: One live individual (12.1/5.2/4.1 mm) and 12 valves (sized 11.9/5.7–18.9/9.0 mm).

Habitat: Collected from sand and muddy sand often mixed with bryozoan debris or bivalve shells.

Ecological significance: A mixed bottom species (PICARD, 1965).

Remarks: Common at collection stations. Live individual was found in sand at MLJ-112 station (Fig. 17.).

*Cardiomya costellata* (Deshayes, 1835) (Fig. 18.)

Stations: MLJ-107, 121.

Depth: 70–103 m.

Material: 2 valves (5.5/3.0 and 7.3/4.0 mm).

Habitat: Collected from muddy sand.

Ecological significance: Not known.

Remarks: Rarely noted in deeper parts of the area studied as well as in the Adriatic Sea. SALVINI-PLAWEN (1991) suggested it is a rare species in the Mediterranean Sea.

**DISCUSSION AND CONCLUSIONS**

Even though there have been a few reports on bivalves from the Mljet area, bivalve fauna of the Mljet National Park deserved more extensive research. This paper gives the first comprehensive report on bivalve fauna in the Mljet National Park and Mljet Island area, which is compiled from results of this study and reviewed data from records published previously.

In this research 130 bivalve species from 38 families were recorded. Live individuals were found for 71 species, while 59 recorded species were presented only by shells. Quite unexpected was the collection of one juvenile individual of an

Indo-Pacific species *Semipallium coruscans coruscans* (Hinds, 1845) detailed by ŠILETIĆ (2004).

The bivalve checklist for Mljet National Park comprises a total of 146 species belonging to 39 families. Taking into consideration that there are more than 200 bivalve species recorded for the Adriatic Sea (211 and 224 species according to FREDJ (1974) and ZAVODNIK (1999), respectively), the listed species account for about 65% to 70% of bivalves noted in the Adriatic Sea. One Mediterranean endemic species (*Pinna nobilis*), a bivalve protected by law, was recorded in substantial numbers in the lake-like inlet part of the National Park, Malo Jezero and Veliko Jezero, which is considered a unique field laboratory for a population study (ŠILETIĆ & PEHARDA, 2003).

In the Mljet National Park bivalves occurred in various benthic communities located on hard and mobile bottoms from the tidal zone down to 120 m in depth, i.e. the maximum depth at which bivalves were collected. Since the diversity of benthic communities in the surveyed area is high (OREPIĆ *et al.*, 1997; ZAVODNIK, 2003), bivalves were sampled in the rocky bottom communities of lower mediolitoral rocks, of photophilic algae, and of the coralligenous community, and in various communities characteristic of sandy and silty deposits.

The most frequently encountered species in the area surveyed were *Arca noae* and *Gastrochaena dubia*, especially along submarine cliffs and rocks in *Posidonia oceanica* beds. Also, the endolithic species *Lithophaga lithophaga* and the species *Striarca lactea*, *Barbatia barbata* and *Chlamys varia* were often noted on hard bottoms in the community of photophilic algae and in the coralligenous community. Numerous individuals of *Pinna nobilis* were recorded in Veliko and Malo jezero in *Cymodocea nodosa* meadows. At the open sea stations usually only single adult specimens were noted on the sand sedimented on the rocky steps of underwater cliffs. According to the study by ŠILETIĆ & PEHARDA (2003), the *Pinna nobilis* population in the lakes area is fairly dense and relatively young. The authors believe that the population is endangered, because there is evidence of poaching. Frequently noted species on mobile bottoms, mostly represented by shells only, were *Ctena decussata*, *Plagiocardium papillosum* and *Venus verrucosa*.

Among species recorded in the area of study only by shells, some species rarely noted for the Adriatic Sea were found. Species concerned are *Nuculana pella*, *Palliolium striatum*, *Pseudamussium sulcatum*, *Limatula gwyni*, *Thyasira granulosa*, *Astarte sulcata*, *Venus casina*, *Globivenus effosa*, *Clausinella fasciata*, *Lajonkairia lajonkairii*, *Mysia undata*, *Thracia villosiuscula* and *Cardiomya costellata*. According to POPPE & GOTO (1993) *Globivenus effosa* is one of the rarest and most sought-after species from the family *Veneridae* in the Mediterranean. Some species also rare in the Adriatic were rarely sampled in the studied area with live specimens (*Ennucula aegeensis*, *Barbatia clathrata*, *Galeomma turtoni* and *Glans aculeata*). The last two species, and *L. lajonkairii*, also were rarely recorded in the Mediterranean Sea (PARENZAN, 1974).

A few species were recorded only in deeper parts of the investigated area since they tend to favour communities of deeper areas characterised by detrital and muddy deposits. These species are *Ennucula aegeensis*, *Atrina pectinata*, *Pseudamus-*

*sium clavatum*, *Limatula gwyni*, *Parvicardium minimum*, *Abra nitida*, and *Abra prismatica*. They were quite rare at the study stations. By contrast, *Neopycnodonte cochlear*, *Cuspidaria cuspidata*, and *Cuspidaria rostrata* were common at the deeper collection sites in the southern part of the National Park.

Some species were extremely rarely found in the area, probably due to the lack of their typical habitat at the surveyed stations (*Tapes decussata*, *Arcopagia crassa*), or they were simply overlooked by divers (like *Lasaea rubra*). However a few species were noted by divers only by genus name (*Ostrea* sp., *Chama* sp.) and specific identification of them was not made. In other species identified only to genus level the shells were either damaged and/or old (9 species) or the muscle imprint inside the valves was too faint to allow identification (*Anomia* sp. and *Paphia* sp.). For a few species (*Musculus* sp., *Hiatella* sp., *Teredo* sp.) no proper literature sources or comparable voucher material were available to facilitate identification.

With regard to literature data, 59 species recorded in this study are noted for the first time for the Mljet Island area. As many as 52 species were recorded exclusively at the sea stations and not in the lakes, while two species i.e. *Acanthocardia paucicostata* and *Teredo* sp. were noticed in the lakes only. Unfortunately, no live individuals of these two species were collected. It is interesting to note that *Cerastoderma glaucum* and *Cerastoderma* sp. shells were encountered in large quantities in Malo Jezero. Only a few shells were recorded at station MLJ- 1 outside Veliko Jezero (in Soline channel), but they were not found in Veliko Jezero.

The bivalves *Modiolus adriaticus*, *Thyasira flexuosa*, *Acanthocardia echinata*, *Acanthocardia tuberculata*, *Parvicardium minimum*, *Abra alba*, *Timoclea ovata*, *Tapes decussata*, and *Mysia undata* were recorded in this study only at the sea stations, while many authors noted them previously in lakes (VULETIĆ, 1953; DRAGANOVIĆ, 1980; OREPIĆ *et al.*, 1997; RADIĆ, 2000; PEHARDA, 2000; PEHARDA *et al.*, 2002a). A few species (*Nucula nucleus*, *Sponylus gaederopus*, *Lima lima*, and *Gastrana fragilis*) previously noted in Malo Jezero by VULETIĆ (1953), DRAGANOVIĆ (1980), OREPIĆ *et al.* (1997), PEHARDA (2000) and PEHARDA *et al.* (2002a) were not found there in the course of our study.

Bivalve species previously recorded in the Mljet National Park area but not confirmed in our research were: *Solemya togata*, *Modiolus modiolus*, *Limea loscombii*, *Cardita calyculata*, *Cerastoderma edule*, *Tellina distorta*, *Tellina planata*, *Gari fervensis*, *Chamelea gallina*, *Irus irus*, and *Hiatella rugosa*, as well as species identified to genus level: *Modiolus* sp. and *Cardium* sp. (VIDOVIĆ, 1955; VULETIĆ, 1953; DRAGANOVIĆ, 1980; OREPIĆ *et al.*, 1997; PEHARDA, 2000; PEHARDA *et al.*, 2002a).

Some of the specified differences in bivalve diversity in the area of study result from identification problems, since 16 species from this study and 6 species from previous papers were identified to genus level only. Species identified only to genus level in previous studies, but which are recorded with some species in the present study include: *Nucula* sp., *Mytilaster* sp., *Musculus* sp., *Pecten* sp., *Chlamys* sp. and *Astarte* sp. (VIDOVIĆ, 1955; OREPIĆ *et al.*, 1997; RADIĆ, 2000; PEHARDA, 2000; PEHARDA *et al.*, 2002a). Probably some of them are already included in this checklist. The genus *Cardium* sp. (which is an old name) noted by VIDOVIĆ (1955) is

included in this checklist since it was not possible to establish under which genus valid name it belongs to. It is possible that the species from that genus is already included in the checklist under one of the valid names.

According to our results the number of bivalve species declines from the open sea (127 species) towards Veliko Jezero and Malo Jezero (55 and 41 species, respectively). Taking into consideration the complete bivalve checklist (Tab. 1), a similar conclusion on the decrease of species diversity arise: open sea 128 species, Veliko Jezero 69, Malo Jezero 65 species. This reduction in the number of species can be related to low diversity of communities, low variety of niches, and substrate types which occur in Veliko Jezero and Malo Jezero as compared to the open sea area (DRAGANOVIĆ, 1980; OREPIĆ *et al.*, 1997; ZAVODNIK, 2003). For example, the coralligenous community is very well developed at many open sea stations, while at a few sites in the lakes it was recorded only by its precoralligenous aspect.

Obviously, the diversity of bivalve fauna at Mljet National Park is relatively high in comparison to that established in other parts of the eastern Adriatic, especially in its island area. For example, in Kornati National Park and Dugi otok Nature Park, in a survey area almost four times larger than the area of Mljet National Park, 71 bivalve species from 33 families were recorded during biocoenological research carried out in the period from 1979 to 1992 (HRS-BRENKO, 1997). This is a very interesting difference because of the great similarity of the geomorphic, sedimental and hydrographic characteristics, the diversity of benthic communities in the two national parks (except of the sea lake area of Mljet Island), and the identical sampling methods used. Further on, similar studies of bivalve fauna were carried out, and bivalve checklists were compiled for the much larger areas in the northern part of the eastern Adriatic coast. In spite of the larger areas surveyed these studies showed lower bivalve diversity. For example, in the Lošinj archipelago area, comprising Susak, Unije and Lošinj Islands and part of Cres Island (about 11 times larger than our studied area) HRS-BRENKO & LEGAC (1992) noted 38 species (only live individuals) from 22 families, while in the insular zone of the northern and part of the central Adriatic Sea i.e. in the area from the Istrian peninsula to Murter Island, 117 bivalve species from 39 families were recorded (LEGAC & HRS-BRENKO, 1982). Also, in Rijeka Bay, which is about nine times larger in area than Mljet National Park, 106 bivalve species from 40 families were recorded (HRS-BRENKO *et al.*, 1998).

Studies of bivalve fauna were also carried out in areas similar in size to the Mljet National Park area. In the north Adriatic, at Rab Island LEGAC (1987) noted 101 live bivalve species from 37 families, while in the mouth of the Krka River MARGUŠ *et al.* (1991) established 52 bivalve species from 27 families. In the central part of the Adriatic Sea RADIĆ (1982) recorded 93 species from 39 families in the area of Makarska, and PEHARDA (2003) noted 89 species from 35 families in Mali Ston Bay. In the south Adriatic at Lokrum Island BELAMARIĆ & ŠERMAN (1989) noticed 37 bivalve species from 17 families and ŠPAN *et al.* (1989) recorded 49 bivalves, while in Boka Kotorska Bay STJEPČEVIĆ (1967) quoted 64 bivalve species from 28 families, STJEPČEVIĆ & PARENZAN (1980) noted 146 species from 39 families and in a paper by STJEPČEVIĆ *et al.* (1982) 144 species (which included 17 subspecies) from 39 families were recorded. In some of these papers the actual numbers of bivalves recorded are



somewhat smaller than the total numbers of bivalves since some species were presented with several synonyms.

Consequently, according to our data there is a high diversity of Bivalvia in Mljet National Park, but there are few or no data concerning some species. In the future more attention should be paid to species that are rather difficult to sample and to a detailed study of specific habitats. The present checklist of Mljet National Park bivalves could serve as a base for this task.

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## S A Ž E T A K

**Morska fauna Nacionalnog parka Mljet (Jadransko more, Hrvatska) 5. Mollusca: Bivalvia.**

T. Šiletić

U Nacionalnom parku Mljet utvrđeno je 130 vrsta školjkaša iz 38 porodica tijekom istraživanja provedenog od 1995. do 2002. godine. Na 63 obalne postaje školjkaši su bilježeni i sakupljeni metodom autonomnog ronjenja, do dubine od 58 m. Na 21 postaji se uzorkovalo pomoću grabila Van Veen, na jednoj postaji s pridnom kočom, a na šest lokaliteta su školjkaši izvađeni iz ribarskih mreža poponica. Za svaku vrstu se navode podaci o njenoj lokalnoj rasprostranjenosti, dubini, staništu, ekološkim značajkama i značajnijim opažanjima. Izrađena je lista školjkaša za područje Nacionalnog parka Mljet sa 146 vrsta iz 39 porodica u kojoj su obuhvaćeni i prethodni literaturni podaci. Navedene vrste predstavljaju oko 70% školjkaša zabilježenih u Jadranskom moru. 61 vrsta nađenih školjkaša je prvi puta zabilježena za područje otoka Mljeta.

59 vrsta iz ovog istraživanja utvrđeno je isključivo na postajama u obalnom moru, a ne u jezerima, dok su dvije vrste, *Acanthocardia paucicostata* i *Teredo* sp. nađene isključivo u jezerima. Utvrđene su i vrste koje su rijetko zabilježene u Jadranskom moru, kao i u istraživanom području. To su: *Nuculana pella*, *Pallium striatum*, *Pseudamussium sulcatum*, *Limatula gwyni*, *Thyasira granulosa*, *Astarte sulcata*, *Venus casina*, *Globivenus effosa*, *Lajonkairia lajonkairii*, *Mysia undata*, *Thracia villosiuscula*, *Cardiomya costellata*, *Ennucula aegeensis*, *Barbatia clathrata* i *Galeomma turtoni*.

Jedna indopacifička vrsta, *Semipallium coruscans coruscans* (Hinds, 1845), nađena je po prvi puta u Sredozemnom moru. Vrsta *Pinna nobilis*, endem Sredozemnog mora i zakonom zaštićena vrsta, zabilježena je u značajnom broju u Malom i Velikom jezeru Nacionalnog parka.