

## Additions to the checklist of the malacofauna of the Boka Kotorska Bay (south-east Adriatic Sea)

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### ABSTRACT

Paper presents new species of gastropods and bivalves recorded for the first time in the Boka Kotorska Bay as results of research conducted from 2016-2018. Eight new species should be added to 304 species of molluscs documented for this area in the recently published check-list of molluscs fauna from Montenegrin marine waters. Studies have shown that the marina Porto Montenegro has been recognized as the host of majority of recorded species (*Pinctada imbricata radiata*, *Thecacera pennigera*, *Polycera elegans*, *Euspira catena* and *Discodoris rosi*). Finding of *T. pennigera* is the first for the Adriatic sea and third for the Mediterranean Sea. Among identified species *Pinna rudis* is on the List of endangered or threatened species (Annex II Barselona Convention) while *Pinctada imbricata radiata* is considered as lessepsian alien species and introduced in the Boka Kotorska Bay.

**Keywords:** molluscs, benthic species, Boka Kotorska Bay, south-east Adriatic Sea

### INTRODUCTION

The Bay of Boka Kotorska is unique when compared to the rest of the Montenegrin coast. It represents a geomorphological formation deeply drawn into the land, where the central part of the bottom is mainly covered by mud (Lepetić, 1965). The ecological conditions in Boka Bay differ considerably from the open part of the south-east coast of the Adriatic Sea. The presence of a large number of underwater springs and the inflow of large quantities of fresh water from land affect the physical and

chemical characteristics of the seawater (Regner *et al.*, 2002).

More intensive scientific research of the malacofauna in the Bay began with the establishment of the Institute of Marine Biology in Kotor. During the 1970s, the first systematic study of the macro-molluscs of the Bay of Kotor was carried out (Stjepčević, 1967). Further, data on species diversity could be found mainly in papers that deal with benthic biocenoses in the Bay (Karaman & Gamulin-Brida, 1970; Stjepčević & Parenzan, 1980; Stjepčević & Parenzan, 1982; Gamulin-Brida,

1983). After this period, there was a pause in the study of molluscs until new information on their presence and distribution became available through the realization of new projects (Mačić & Kljajić, 2012; RAC/SPA - UNEP/MAP, 2013; Petović & Marković, 2017).

As a result of comprehensive study on all available data of marine molluscs from Montenegrin coast check-list was created by Petović *et al.*, (2017). For the area of the Boka Kotorska Bay 304 species were counted (Annex I). Since that research conducted from 2016-2018 show presence of new species, so main goal of this paper is to add new species to the existing check-list.

## MATERIAL AND METHODS

To prepare the paper, we used all available published data such as scientific papers, reports prepared by the Institute and data not published/personal communications referred to the Boka Kotorska Bay (Fig. 1). Species newly reported for the area are described by location, sampling date, habitat type, depth, references and photography (Fig. 2). Valid nomenclature and classification of reported taxa were checked according to the CLEMAM and WoRMS database.

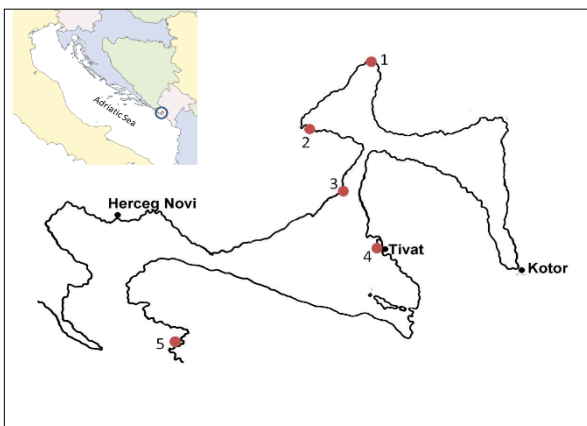


Figure 1. Map of the research area (Boka Kotorska Bay), indicating the sampling locations (1-Risan; 2-Kostanjica; 3-Sveta Nedjelja; 4-Porto Montenegro; 5-Žanjice)

## RESULTS AND DISCUSSION

For the area of the Boka Kotorska Bay, eight species of molluscs in seven families have been documented since the last checklist of marine molluscs of the Montenegrin part of the Adriatic Sea was created (Petović *et al.*, 2017). In total, two bivalves and six gastropods were newly documented, and are listed below:

Class: Gastropoda

Family: Naticidae

*Euspira catena* (da Costa, 1778)

This species was, until now, known from the open coast of the south-east Adriatic Sea (Petović *et al.*, 2017). During a survey in the Porto Montenegro marina in the summer of 2017, we collected this species from sandy-muddy substrate at a depth of 6 m.

Family: Fasciolaridae

*Tarantinaea lignaria* (Linnaeus, 1758)

This gastropod until now only been recorded in open sea habitats (Petović *et al.*, 2017). It was found at the Žanjice site in August 2016 on a sandy bottom at a depth of 5 m.

Family: Discodorididae

*Discodoris rosi* Ortea, 1979

Two specimens were collected from the piers in marina Porto Montenegro (Tivat Bay) in spring 2018 (personal data) and this is the first record in Montenegrin waters. This species is known from eastern Atlantic coast, west Mediterranean and Adriatic.

Family: Polyceridae

*Thecacera pennigera* (Montagu, 1813)

This sea slug is recorded for the first time during a biological monitoring program of fouling communities performed in the Porto Montenegro marina (Tivat, Boka Kotorska, Montenegro) by SCUBA diving in April 2017 (Petović & Lipej, 2017). It is also the first finding of this species for the Adriatic Sea. In the Mediterranean Sea is recorded from two

locations (Doneddu & Trainito, 2015) with very similar ecological conditions as the Boka Kotorska Bay.

*Polycera elegans* (Bergh, 1894)

Nudibranch was recorded during a survey in the Porto Montenegro marina, Tivat in November 2017 at a depth of 7 m on a pier that was richly overgrown by bryozoans. This is the first finding for the Bay of Kotor and the Montenegrin coast (VA, 2017). The species was described in 1894 from Rovinj (Zenetos *et al.*, 2016).

Family: Tritoniidae

*Marionia blainvillea* (Risso, 1818)

This juvenile specimen was found during a study performed by SCUBA in the area of Sv. Nedjelja in Boka Kotorska Bay in summer 2017, crawling on the gorgonian *Leptogorgia sarmentosa* (Esper, 1789). This is the first record of this species for Montenegrin waters (V. Mačić personal communication).

Class: Bivalvia

Family: Pinnidae

*Pinna rudis* Linnaeus, 1758

These mussels populate the inner part of Boka Bay and specimens were recorded on the sea floor from Kostanjica to Risan, on muddy-sandy substrate at about 20 m in depth. The species is included in Annex II of the Bern Convention as a strictly protected species and in the Barcelona Convention Protocol in Annex II as threatened or endangered marine species. We collected only dead specimens of different length; the longest was 190 mm. There is no available data on the distribution of this species along the eastern Adriatic Sea.

Family: Pteriidae

*Pinctada imbricata radiata* (Leach, 1814)

This bivalve, known as a “pearl oyster”, is widespread in shallow waters of the tropical and subtropical continental shelf regions (Wada & Tëmkin, 2008). In the Mediterranean Sea it is considered as lessepsian alien species since

1874 and since then its spreading through the basin must be debited both to introduction for mariculture and to natural means (Lodola *et al.*, 2013). It was recorded for the first time on the pier in the Porto Montenegro marina, Tivat, in August 2016 (Petović & Mačić, 2017), after which it continued to expand its range across the Bay. Today, this species colonizes locations such as mariculture sites (Sveta Nedelja, Dražin vrt, Orahovac) and Sveti Stasija in *Posidonia oceanica* meadows.

## DISCUSSION

Stjepčević (1967) gave the first illustration of the qualitative distribution of macro-molluscs in the Boka Kotorska Bay. He collected 138 species. Later, the study of benthic biocenoses (Karaman & Gamulin-Brida, 1970) confirmed the presence of 61 species for the entire Bay, while several years after, Stjepčević & Parenzan (1980), listed 164 species from the phylum Gastropoda, five Scaphopoda species and 146 Bivalvia species for the inner part of the Kotor-Risan Bay. Recent research and more detailed studies of the benthic communities of the Kotor-Risan Bay (RAC / SPA - UNEP / MAP, 2013) have led to numerous records of new species. Compilations of available literature data for the area of the Montenegrin coast resulted in the creation of a check list (Petović *et al.*, 2017), where three species of Polyplacophora, 166 species of Gastropoda, 123 species of Bivalvia, five species of Scaphopoda and seven species of Cephalopoda are reported from the area of Boka Kotorska Bay – 304 species in total. Considering the dynamic changes in the Bay in terms of the development of very intensive nautical tourism and mariculture, the number of vectors for the introduction of new species is also increasing. Recent studies have shown that the probably introduced species *Pinctada imbricata radiata* has spread across the Bay, and it's



*Thecacera pennigera*  
(photo: S. Petović)



*Marionia blainvillea*  
(photo: V. Mačić)



*Pinctada imbricata radiata*  
(photo: S. Petović)



*Euspira catena*  
(photo:[http://www.aphotomarine.com/snail\\_euspira\\_catena\\_necklace\\_shell.html](http://www.aphotomarine.com/snail_euspira_catena_necklace_shell.html))



*Pinna rudis*  
(photo: S. Petović)



*Polycera elegans*  
(photo: V. Mačić)



*Discodoris rosi* (photo: S. Petović)



*Tarantinaea lignaria*  
(photo:[http://www.cibsub.cat/bioespece-tarantinaea\\_lignaria-73036](http://www.cibsub.cat/bioespece-tarantinaea_lignaria-73036))

Figure 2. Molluscs species recorded from the Boka Kotorska Bay since the release of the last checklist of the Montenegrin waters

establishment should be examined by future research because its populations are increasing and have successfully reproduced in the Tivat Bay (VA, 2017). However, currently, only a few specimens have been recorded from the Adriatic sea. Vio & De Min (1996) described the species in Trieste Bay from live individuals attached to an oil platform originating from the Sicilian Channel. The species has not been recorded since from the Gulf of Trieste, and further research in the area seems to confirm that it did not survive (Crocetta *et al.* 2009). Recently, two juvenile specimens (less than 3 mm in shell length) from 59 m on a silty-sand bottom in Croatian waters were identified as *Pinctada radiata* by Doğan & Nerlović (2008). Personal information on the presence of the mussel *Pinna rudis* in the area of the Kotor-Risan Bay is not a new, but in the literature were missing for an unknown reason. During a scientific study using a trawl beam inside the Kotor-Risan Bay, which is otherwise prohibited as a fishing technique, the empty shells were collected. This species is much more rare compared with *Pinna nobilis*, whose populations in the Bay are more numerous and widespread in shallow water. *Euspira catena* and *Tarantinaea lignaria* are present in the open sea benthic communities of the Montenegrin coast (Petović *et al.*, 2017) and the Mediterranean in general (Öztürk *et al.*, 2014) and have recently been recorded for the first time in the Boka Kotorska Bay. This data only indicates the fact that the molluscs of the Bay remain significantly unexplored. The finding of *Thecacera pennigera* represents the first record for the Adriatic Sea (Petović & Lipej, 2017). In the Mediterranean Sea, it is considered rare, and until now was only recorded from Israeli waters (Barchana, 2008) and waters surrounding Italy (Tiralongo & Baldaconi, 2014). The nudibranch *Polycera elegans* was recorded for the first time in the Adriatic by Bergh in 1894 on the basis of a specimen from Rovinj (Zenetos *et al.*, 2016), whereas this current finding is the first for the Montenegrin coast. As the literature points out (Trainito & Doneddu, 2014), the species has been recorded on habitat rich in bryozoans cover. The species *Marionia blainvillea* is considered rare for the Adriatic

Sea and this is first record for the Montenegrin coast. The species was found in the area where gorgonians are widespread, as indicated in the literature (Trainito & Doneddu, 2014). Species *Discodoris rosi* is recorded on the piers in marine Porto of Montenegro on hard substrate cover by bryozoans and hydrozoans at 5 m in depth. This species previously mentioned for Slovenian and Croatian waters (Zenetos *et al.*, 2016) is for first time documented for the Montenegro.

Eight new species that need to be added to an existing checklist, recorded over the last 2 years, indicate that the Bay of Boka Kotorska is a space that deserves great attention for future research. Studies have shown that the Porto Montenegro marina has been recognized as the host of majority of recorded species. The growing of human activities that favor the arrival of the new species and the fact that parts of the bay have not yet sufficiently been explored, particularly the Bay of Herceg Novi and the Bay of Tivat, means that there could be many more species to discover that are new to the area. Some of them may have just arrived and some may have been resident for a long time, but have not been discovered yet by the researchers.

## CONCLUSIONS

By reviewing the data in the literature and by personal communications, it has been found that, in the period between the creation of the most recent checklist for molluscs of the Montenegrin marine waters, eight species have been recorded from the area of Boka Kotorska. Of these molluscs, two species belong to Bivalvia and six belong to Gastropoda. The pearl oyster, *Pinctada imbricata radiata*, probably is an introduced species and with a very successful spreading population. *Pinna rudis* was found on the sea bottom from Kostanjica to Risan. The record of the nudibranch *Thecacera pennigera* is the first for the Adriatic Sea, while the species *Polycera elegans*, *Marionia blainvillea* and *Discodoris*

*rosi* were recorded from the Montenegrin coast for the first time.

Based on all of the above, it can be concluded that Boka Kotorska Bay represents an area that requires great attention from researchers, and could greatly contribute to the knowledge of the biodiversity of the Montenegrin coast.

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ANNEX I

Table 1. The checklist of marine molluscs from the Boka Kotorska Bay extracted from Petović *et al.*, 2017; Habitat (Hs = hard substratum including algae, sponge, mussels, etc; Ss = soft substratum-including all phanerogams; P = pelagic; D = demersal; Pz = parasite); \* = alien species; # = endangered or threatened species.

Group/Species	Habitat
<b>POLYPLACOPHORA</b>	
<b>Chitonidae</b>	
<i>Chiton corallinus</i> (Risso,1826)	Hs;Ss
<i>Chiton olivaceus</i> (Spengler, 1797)	Hs;Ss
<b>Acanthochitonidae</b>	
<i>Acanthochiton fascicularis</i> (Linnaeus, 1767)	Hs;Ss
<b>GASTROPODA</b>	
<b>Patellidae</b>	
<i>Patella caerulea</i> (Linnaeus, 1758 )	Hs
<i>Patella rustica</i> (Linnaeus, 1758)	Hs
<i>Patella vulgata</i> (Linnaeus, 1758)	Hs
<b>Fissurellidae</b>	
<i>Diodora gibberula</i> (Lamarck,1822)	Hs;Ss
<i>Diodora graeca</i> (Linnaeus,1758)	Hs;Ss
<i>Diodora italica</i> (Defrance,1820)	Hs;Ss
<i>Emarginella huzardii</i> (Payraudeau,1826)	Hs;Ss
<i>Emarginula fissura</i> (Linnaeus,1758)	Hs;Ss
<i>Emarginula octaviana</i> Coen 1939	Hs;Ss
<i>Puncturella noachina</i> (Linnaeus,1771)	Hs;Ss
<b>Haliotidae</b>	
<i>Haliotis tuberculata tuberculata</i> Linné 1758	Hs;Ss
<b>Trochidae</b>	
<i>Clanculus corallinus</i> (Gmelin,1791)	Hs;Ss
<i>Clanculus cruciatus</i> ( Linnaeus, 1758)	Hs;Ss
<i>Clelandella miliaris</i> (Brocchi, 1814)	Ss
<i>Gibbula umbilicaris</i> (Linnaeus,1758)	Hs;Ss
<i>Gibbula adriatica</i> (Philippi, 1844 )	Hs
<i>Gibbula albida</i> (Gmelin,1791)	Hs;Ss
<i>Gibbula divaricata</i> (Linnaeus,1758)	Hs;Ss
<i>Gibbula drepanensis</i> (Brugnone,1873)	Hs;Ss
<i>Gibbula fanulum</i> (Gmelin,1791)	Hs;Ss
<i>Gibbula guttadauri</i> (Philippi,1836)	Ss

<i>Gibbula magus</i> (Linnaeus,1758)	Hs;Ss
<i>Gibbula philberti</i> (Récluz,1843)	Hs;Ss
<i>Gibbula rarilineata</i> (Michaud,1829)	Hs;Ss
<i>Gibbula varia</i> (Linnaeus,1758)	Hs;Ss
<i>Phorcus richardi</i> (Payraudeau, 1826)	Hs;Ss
<i>Jujubinus exasperatus</i> (Pennant,1777)	Hs;Ss
<i>Jujubinus striatus</i> (Linnaeus,1758)	Hs;Ss
<i>Phorcus articulatus</i> (Lamarck, 1822)	Hs
<i>Phorcus mutabilis</i> (Philippi, 1846)	Hs
<i>Phorcus turbinatus</i> (Born, 1778)	Hs
<b>Calliostomatidae</b>	
<i>Calliostoma conulus</i> (Linnaeus, 1758)	Hs;Ss
<i>Calliostoma laugieri</i> (Payraudeau, 1826)	Hs;Ss
<i>Calliostoma zizyphinum</i> (Linnaeus,1758)	Hs;Ss
<b>Turbinidae</b>	
<i>Bolma rugosa</i> (Linnaeus,1767)	Hs;Ss
<b>Colloniidae</b>	
<i>Homalopoma sanguineum</i> (Linnaeus, 1758)	Hs;Ss
<b>Neritidae</b>	
<i>Smaragdia viridis</i> (Linnaeus,1758)	Hs;Ss
<b>Cerithiidae</b>	
<i>Bittium latreillii</i> (Payraudeau, 1826)	Hs;Ss
<i>Bittium reticulatum</i> (Da Costa, 1778)	Hs;Ss
<i>Bittium submamillatum</i> (de Rayneval & Ponzi, 1854)	Ss
<i>#Cerithium vulgatum</i> Bruguière, 1792	Hs;Ss
<b>Turritellidae</b>	
<i>Turritella communis</i> (Risso,1826)	Hs;Ss
<i>Turritella turbona</i> (Monterosato, 1877 )	Hs;Ss
<b>Triphoridae</b>	
<i>Monophorus perversus</i> (Linnaeus, 1758)	Hs;Ss
<i>Marshallora adversa</i> (Montagu, 1803)	Hs;Ss
<i>Strobiligera brychia</i> (Bouchet & Guillemot 1978)	Ss
<b>Cerithiopsidae</b>	
<i>Metaxia metaxae</i> (Delle Chiaje 1828)	Ss
<i>Cerithiopsis jeffreysi</i> (Watson, 1885)	Ss
<b>Epitoniidae</b>	
<i>Epitonium clathrus</i> (Linnaeus,1758)	Hs;Ss
<i>Epitonium muricatum</i> (Risso, 1826)	Hs;Ss
<i>Epitonium turtonis</i> (Turton, 1819)	Hs;Ss
<b>Eulimidae</b>	



<i>Eulima glabra</i> (Da Costa,1778)	Pz	# <i>Luria lurida</i> (Linnaeus, 1758)	Hs
<i>Melanella compactilis</i> (Locard, 1892)	Ss	# <i>Zonaria pyrum</i> (Gmelin, 1791)	Hs
<b>Littorinidae</b>		# <i>Erosaria spurca</i> (Linné 1758)	Hs;Ss
<i>Melarhappe neritoides</i> (Linnaeus, 1758)	Hs	<b>Ovulidae</b>	
<b>Rissoidae</b>		<i>Pseudosimnia adriatica</i> (G. B. Sowerby I, 1828)	Hs
<i>Alvania cancellata</i> (Da Costa, 1778)	Hs;Ss	<b>Naticidae</b>	
<i>Alvania lineata</i> (Risso, 1826)	Hs;Ss	<i>Euspira macilenta</i> (Philippi, 1844)	Hs;Ss
<i>Alvania cimex</i> (Linnaeus,1758)	Hs;Ss	<i>Euspira nitida</i> (Donovan, 1804)	Ss
<i>Alvania cimicoides</i> (Forbes, 1844)	Hs;Ss	<i>Natica hebraea</i> (Martyn,1784)	Hs;Ss
<i>Alvania hispidula</i> (Monterosato, 1884)	Ss	<i>Euspira catena</i> (da Costa, 1778)	Hs;Ss
<i>Peringiella elegans</i> (Locard, 1892)	Hs;Ss	<i>Euspira intricata</i> (Donovan, 1804)	Hs;Ss
<i>Pusillina marginata</i> (Michaud, 1830)	Hs;Ss	<i>Notocochlis dillwynii</i> (Payraudeau 1826)	Hs;Ss
<i>Rissoa guerinii</i> (Récluz,1843)	Hs;Ss	<i>Neverita josephina</i> (Risso, 1826)	Ss
<i>Rissoa membranacea</i> (Adams J., 1800)	Hs;Ss	<i>Natica stercusmuscarum</i> (Gmelin, 1791)	Ss
<i>Rissoa monodonta</i> (Philippi,1836)	Ss	<b>Tonnidae</b>	
<i>Rissoa parva</i> (da Costa, 1778)	Hs;Ss	# <i>Tonna galea</i> (Linnaeus, 1758)	Ss
<i>Rissoa splendida</i> (Eichwald,1830)	Hs;Ss	<b>Cassidae</b>	
<i>Setia ambigua</i> (Brugnone, 1873)	Hs;Ss	<i>Galeodea echinophora</i> (Linnaeus,1758)	Ss
<b>Caecidae</b>		<b>Muricidae</b>	
<i>Caecum trachea</i> (Montagu, 1803)	Hs;Ss	<i>Bolinus brandaris</i> (Linnaeus, 1758)	Hs;Ss
<i>Parastrophia asturiana</i> de Folin 1870	Ss	<i>Coralliophila squamosa</i> (Bivona Ant. in Bivona And. 1838)	Hs;Ss
<b>Hydrobiidae</b>		<i>Hexaplex trunculus</i> (Linnaeus, 1758)	Hs;Ss
<i>Peringia ulvae</i> (Pennant, 1777)	Ss	<i>Muricopsis cristata</i> (Brocchi,1814)	Hs
<b>Iravadiidae</b>		<i>Ocenebra erinaceus</i> (Linné 1758)	Hs;Ss
<i>Hyalia vitrea</i> (Montagu, 1803)	Ss	<b>Marginellidae</b>	
<b>Tornidae</b>		<i>Granulina marginata</i> (Bivona Ant. 1832)	Hs;Ss
<i>Circulus striatus</i> (Philippi 1836)	Ss	<b>Costellariidae</b>	
<b>Vermetidae</b>		<i>Vexillum tricolor</i> (Gmelin,1790)	Hs;Ss
<i>Thylacodes arenarius</i> (Linnaeus, 1758)	Hs	<i>Vexillum luculentum</i> (Reeve, 1845)	Hs;Ss
<i>Petalconchus glomeratus</i> (Linnaeus, 1758)	Hs	<i>Vexillum acuminatum</i> (Gmelin, 1791)	Hs;Ss
<b>Aporrhaidae</b>		<b>Buccinidae</b>	
<i>Aporrhais pespelecani</i> (Linnaeus, 1758)	Ss	<i>Euthria cornea</i> (Linnaeus, 1758)	Hs;Ss
<b>Calyptraeidae</b>		<i>Pollia dorbignyi</i> (Payraudeau, 1826)	Hs;Ss
<i>Calyptraea chinensis</i> (Linnaeus, 1758)	Ss	<i>Pisania striata</i> (Gmelin, 1791)	Hs;Ss
<i>Crepidula moulinsii</i> (Michaud, 1829)	Hs;Ss	<b>Nassariidae</b>	
<b>Capulidae</b>		<i>Cyclope neritea</i> (Linnaeus,1758)	Hs;Ss
<i>Capulus ungaricus</i> (Linnaeus, 1758)	Hs;Ss	<i>Nassarius corniculum</i> (Olivi, 1792)	Ss
<b>Triviidae</b>		<i>Nassarius cuvierii</i> (Payraudeau, 1826)	Hs;Ss
<i>Trivia multilirata</i> (G. B. Sowerby II, 1870)	Ss	<i>Nassarius mutabilis</i> (Linnaeus,1758)	Ss
<b>Cypraeidae</b>		<i>Nassarius pygmaeus</i> (Lamarck, 1822)	Hs;Ss

<i>Nassarius reticulatus</i> (Linné 1758)	Hs;Ss	<i>Acteon tornatilis</i> (Linnaeus, 1758)	Hs;Ss
<i>Nassarius incrassatus</i> (Strøm, 1768)	Hs;Ss	<b>Ringiculidae</b>	
<b>Columbellidae</b>		<i>Ringicula auriculata</i> (Ménard de la Groye,1811)	Ss
<i>Columbella rustica</i> (Linnaeus, 1758)	Hs;Ss	<i>Ringicula conformis</i> (Monterosato,1877)	Hs;Ss
<i>Mitrella scripta</i> (Linnaeus,1758)	Hs;Ss	<i>Ringicula gianninii</i> Nordsieck 1974	Ss
<b>Fascioliariidae</b>		<b>Haminoeidae</b>	
<i>Fusinus pulchellus</i> (Philippi,1844)	Ss	<i>Haminoea hydatis</i> (Linnaeus,1758)	Hs;Ss
<i>Fusinus rostratus</i> (Olivi,1792)	Hs;Ss	<i>Haminoea navicula</i> (Da Costa,1778)	Ss
<i>Fusinus parvulus</i> (Monterosato 1884)	Ss	<i>Weinkauffia turgidula</i> (Forbes, 1844)	Ss
<i>Fusinus syracusanus</i> (Linnaeus,1758)	Hs;Ss	<b>Philinidae</b>	
<b>Conidae</b>		<i>Philine quadripartita</i> Ascanius 1772	Hs;Ss
<i>Conus ventricosus</i> (Gmelin, 1791)	Hs;Ss	<i>Philine scabra</i> (O. F. Müller, 1784)	Ss
<b>Horaiclavidae</b>		<b>Cylichnidae</b>	
<i>Haedropleura septangularis</i> (Montagu, 1803)	Ss	<i>Cylichna cylindracea</i> (Pennant,1777)	Ss
<b>Mangeliidae</b>		<b>Plakobranchidae</b>	
<i>Bela brachystoma</i> (Philippi, 1844)	Ss	<i>Thuridilla hopei</i> (Vérany, 1853)	Hs;Ss
<i>Bela taprurensis</i> (Pallary, 1904)	Ss	<b>Akeridae</b>	
<i>Mangelia attenuata</i> (Montagu, 1803)	Ss	<i>Akera bullata</i> O. F. Müller, 1776	Ss
<i>Mangelia costulata</i> Risso, 1826	Ss	<b>Aplysiidae</b>	
<i>Mangelia striolata</i> Risso, 1826	Ss	<i>Aplysia depilans</i> (Gmelin, 1791)	Hs;Ss
<i>Mangelia scabrida</i> Monterosato 1890	Ss	* <i>Aplysia dactylomela</i> (Rang, 1828)	Hs
<i>Mangelia stosiciana</i> Brusina 1869	Ss	* <i>Bursatella leachi</i> (Blainville, 1817)	Ss
<i>Mangelia unifasciata</i> (Deshayes, 1835)	Hs;Ss	<b>Discodorididae</b>	
<b>Raphitomidae</b>		<i>Geitodoris portmanni</i> (Schmekel 1972)	Hs
<i>Raphitoma aequalis</i> (Jeffreys, 1867)	Ss	<i>Platydorid argo</i> (Linné 1767)	Hs
<i>Raphitoma philberti</i> (Michaud,1829)	Ss	<b>Chromodorididae</b>	
<i>Raphitoma purpurea</i> (Montagu, 1803)	Hs;Ss	<i>Felimare picta</i> (Schultz in Philippi, 1836)	Hs
<i>Raphitoma echinata</i> (Brocchi 1814)	Hs;Ss	<b>Tritoniidae</b>	
<i>Raphitoma cordieri</i> (Payraudeau, 1826)	Ss	<i>Tritonia nilsodhneri</i> (Marcus Ev., 1983 )	Hs
<b>Mathildidae</b>		<b>Facelinidae</b>	
<i>Mathilda quadricarinata</i> (Brocchi,1814)	Hs;Ss	<i>Cratena peregrina</i> (Gmelin, 1791)	Hs
<b>Pyramidellidae</b>		<i>Dicata odhneri</i> (Schmekel, 1967)	Hs
<i>Eulimella acicula</i> (Philippi, 1836)	Pz	<b>Flabellinidae</b>	
<i>Eulimella scillae</i> (Scacchi,1835)	Pz	<i>Flabellina affinis</i> (Gmelin, 1791)	Hs;Ss
<i>Megastomia conoidea</i> (Brocchi, 1814)	Pz	<i>Flabellina ischitana</i> (Hirano & Thompson, 1990)	Hs
<i>Turbonilla delicata</i> (Monterosato, 1874)	Pz	<b>Rissoellidae</b>	
<i>Turbonilla gradata</i> (Bucquoy, Dautzenberg & Dollfus, 1883)	Pz	<i>Rissoella diaphana</i> (Alder, 1848)	Hs
<i>Turbonilla lactea</i> (Linnaeus,1758)	Pz	<b>Rissoinidae</b>	
<i>Turbonilla pusilla</i> (Philippi,1844)	Pz	<i>Rissoina bruguieri</i> (Payraudeau,1826)	Hs
<b>Acteonidae</b>		<b>BIVALVIA</b>	

<b>Nuculidae</b>		<i>Mimachlamys varia</i> (Linnaeus, 1758)	Ss
<i>Nucula nitidosa</i> (Winckworth, 1930)	Ss	<b>Spondylidae</b>	
<i>Nucula nucleus</i> (Linnaeus, 1758)	Ss	<i>Spondylus gaederopus</i> (Linnaeus, 1758)	Hs
<i>Nucula sulcata</i> (Bronn, 1831)	Ss	<b>Anomiidae</b>	
<b>Nuculanidae</b>		<i>Anomia ephippium</i> (Linnaeus, 1758)	Ss
<i>Nuculana pella</i> (Linnaeus, 1767)	Ss	<i>Heteranomia squamula</i> (Linnaeus, 1758)	Ss
<i>Saccella commutata</i> (Philippi, 1844)	Ss	<i>Monia patelliformis</i> (Linnaeus, 1761)	Ss
<b>Arcidae</b>		<b>Limidae</b>	
<i>Acar gradata</i> (Broderip & Sowerby, 1829)	Ss	<i>Lima lima</i> (Linnaeus, 1758)	Hs
<i>Anadara polii</i> (Mayer, 1868)	Ss	<i>Limaria hians</i> (Gmelin, 1791)	Ss
* <i>Anadara transversa</i> (Say, 1822)	Ss	<b>Ostreidae</b>	
<i>Arca noae</i> (Linnaeus, 1758)	Hs	<i>Ostrea edulis</i> Linnaeus, 1758	Hs
<i>Arca tetragona</i> (Poli, 1795)	Ss	<i>Ostrea stentina</i> (Payraudeau, 1826)	Hs
<b>Noetiidae</b>		<b>Lucinidae</b>	
<i>Striarca lactea</i> (Linnaeus, 1758)	Hs;Ss	<i>Anodontia fragilis</i> (Philippi 1836)	Ss
<b>Glycymerididae</b>		<i>Ctena decussata</i> (Costa O.G., 1829)	Ss
<i>Glycymeris glycymeris</i> (Linnaeus, 1758)	Ss	<i>Myrtea spinifera</i> (Montagu, 1803)	Ss
<i>Glycymeris nummaria</i> (Linnaeus, 1758)	Ss	<i>Loripes lucinalis</i> (Lamarck, 1818)	Ss
<b>Mytilidae</b>		<i>Lucinella divaricata</i> (Linnaeus, 1758)	Ss
<i>Dacrydium vitreum</i> (Møller, 1842)	Hs;Ss	<i>Lucinoma borealis</i> (Linnaeus, 1767)	Ss
<i>Modiolus barbatus</i> (Linnaeus, 1758)	Hs;Ss	<b>Thyasiridae</b>	
# <i>Lithophaga lithophaga</i> (Linnaeus, 1758)	Hs	<i>Thyasira flexuosa</i> (Montagu, 1803)	Ss
<i>Musculus discors</i> (Linnaeus, 1767)	Ss	<i>Thyasiridae incertae_sedis</i> (nominal taxa in need of reassessment)	Ss
<i>Mytilaster lineatus</i> (Gmelin, 1791)	Ss	<b>Ungulinidae</b>	
<i>Mytilaster minimus</i> (Poli, 1795)	Hs	<i>Diplodonta brocchii</i> (Deshayes 1850)	Ss
<i>Mytilus galloprovincialis</i> (Lamarck, 1819)	Hs;Ss	<i>Diplodonta rotundata</i> (Montagu, 1803)	Ss
<i>Mytilus edulis</i> (Linnaeus, 1758)	Hs;Ss	<b>Chamidae</b>	
<i>Gibbomodiola adriatica</i> (Lamarck, 1819)	Ss	<i>Chama circinata</i> (di Monterosato, 1878)	Hs;Ss
<b>Pinnidae</b>		<i>Chama gryphoides</i> (Linnaeus, 1758)	Hs;Ss
# <i>Pinna nobilis</i> (Linnaeus, 1758)	Ss	<b>Lasaeidae</b>	
<i>Atrina fragilis</i> (Pennant 1777)	Ss	<i>Lepton squamosum</i> (Montagu, 1803)	Ss
<b>Pteriidae</b>		<b>Montacutidae</b>	
<i>Pteria hirundo</i> (Linnaeus, 1758)	Hs;Ss	<i>Kurtiella bidentata</i> (Montagu, 1803)	Ss
<b>Pectinidae</b>		<b>Sportellidae</b>	
<i>Aequipecten opercularis</i> (Linné 1758)	Ss	<i>Sportella recondita</i> (Fischer P. in de Folin 1872)	Ss
<i>Manupecten pesfelis</i> (Linnaeus, 1758)	Hs;Ss	<b>Cardiidae</b>	
<i>Flexopecten glaber</i> (Linnaeus, 1758)	Ss	<i>Acanthocardia echinata</i> (Linnaeus, 1758)	Ss
<i>Pecten jacobaeus</i> (Linné 1758)	Ss	<i>Acanthocardia paucicostata</i> (G. B. Sowerby II, 1834)	Ss
<i>Pecten maximus</i> (Linnaeus, 1758)	Ss	<i>Acanthocardia tuberculata</i> (Linnaeus, 1758)	Ss
<i>Pseudamussium sulcatum</i> (Müller O.F. 1776)	Ss		
<i>Talochlamys multistriata</i> (Poli, 1795)	Ss		

<i>Cerastoderma glaucum</i> (Bruguière, 1789)	Ss	<b>Veneridae</b>	
<i>Laevicardium oblongum</i> (Gmelin,1791)	Ss	<i>Chamelea gallina</i> (Linnaeus,1758)	Ss
<i>Papillicardium papillosum</i> (Poli 1791)	Ss	<i>Clausinella fasciata</i> (da Costa, 1778)	Ss
<i>Parvicardium exiguum</i> (Gmelin,1791)	Ss	<i>Dosinia lupinus</i> (Linné 1758)	Ss
<i>Parvicardium minimum</i> (Philippi,1836)	Ss	<i>Dosinia exoleta</i> (Linnaeus,1758)	Ss
<i>Parvicardium scabrum</i> (Philippi, 1844)	Ss	<i>Gouldia minima</i> (Montagu,1803)	Ss
<b>Mactridae</b>		<i>Irus irus</i> (Linnaeus,1758)	Hs;Ss
<i>Mactra glauca</i> (Born, 1778 )	Ss	<i>Mysia undata</i> (Pennant,1777)	Ss
<i>Mactra stultorum</i> (Linnaeus,1758)	Ss	<i>Petricola lithophaga</i> (Retzius,1786)	Hs;Ss
<i>Spisula subtruncata</i> (da Costa, 1778)	Ss	<i>Pitar rudis</i> (Poli,1795)	Ss
<b>Mesodesmatidae</b>		<i>Polititapes aureus</i> (Gmelin, 1791)	Ss
<i>Donacilla cornea</i> (Poli,1795)	Ss	<i>Ruditapes decussatus</i> (Linnaeus, 1758)	Ss
<b>Tellinidae</b>		<i>Timoclea ovata</i> (Pennant, 1777)	Ss
<i>Arcopagia balaustina</i> (Linnaeus, 1758)	Ss	<i>Venus verrucosa</i> Linné 1758	Ss
<i>Arcopagia crassa</i> (Pennant 1777)	Ss	<i>Venus casina</i> Linné 1758	Ss
<i>Gastrana fragilis</i> (Linnaeus,1767)	Ss	<b>Corbulidae</b>	
<i>Tellina distorta</i> Poli,1791	Ss	<i>Corbula gibba</i> (Olivi,1792)	Ss
<i>Tellina donacina</i> Linné 1758	Ss	<b>Teredinidae</b>	
<i>Tellina pulchella</i> (Lamarck,1818)	Ss	* <i>Teredo navalis</i> (Linnaeus,1758)	Hs
<i>Tellina serrata</i> (Brocchi, 1814)	Ss	<b>Gastrochaenidae</b>	
<i>Tellina tenuis</i> (da Costa, 1778)	Ss	<i>Gastrochaena dubia</i> (Pennant 1777)	Hs
<b>Donacidae</b>		<b>Solenidae</b>	
<i>Donax semistriatus</i> (Poli, 1785)	Ss	<i>Solen marginatus</i> (Pulteney,1799)	Hs
<b>Psammobiidae</b>		<b>Pharidae</b>	
<i>Gari fervensis</i> (Gmelin 1791)	Ss	<i>Ensis minor</i> (Chenu,1843)	Ss
<i>Gari depressa</i> (Pennant, 1777)	Ss	<i>Pharus legumen</i> (Linnaeus,1767)	Ss
<i>Gari tellinella</i> (Lamarck, 1818)	Ss	<i>Phaxas pellucidus</i> (Pennant, 1777)	Ss
<b>Semelidae</b>		<b>Hiatellidae</b>	
<i>Abra alba</i> (W. Wood., 1802)	Ss	<i>Hiatella arctica</i> (Linnaeus,1767)	Hs
<i>Abra nitida</i> (Müller O.F.,1776)	Ss	<i>Hiatella rugosa</i> (Linnaeus,1767)	Hs
<i>Abra prismatica</i> (Montagu,1808)	Ss	<i>Saxicavella jeffreysi</i> (Winckworth,1930)	Hs
<i>Abra segmentum</i> (Récluz, 1843)	Ss	<b>Thraciidae</b>	
<i>Scrobicularia cottardii</i> (Payraudeau,1826)	Ss	<i>Thracia corbuloidea</i> (Blainville, 1827)	Ss
<i>Scrobicularia plana</i> (Da Costa,1778)	Ss	<i>Thracia gracilis</i> Jeffreys 1865	Ss
<b>Solecurtidae</b>		<i>Thracia phaseolina</i> (Lamarck, 1818)	Ss
<i>Azorinus chamasolen</i> (Da Costa,1778)	Ss	<i>Thracia pubescens</i> (Pulteney,1799)	Ss
<i>Solecurtus candidus</i> (Brocchi, 1814)	Ss	<b>Pandoridae</b>	
<b>Trapeziidae</b>		<i>Pandora pinna</i> (Montagu,1803)	Ss
<i>Coralliophaga lithophagella</i> (Lamarck, 1819)	Ss	<b>Poromyidae</b>	
<b>Glossidae</b>		<i>Poromya granulata</i> (Nyst & Westendorp,1839)	Ss
<i>Glossus humanus</i> (Linnaeus,1758)	Ss		

<b>Cuspidariidae</b>		<i>Sepia elegans</i> (Blainville,1827)	D
<i>Cuspidaria cuspidata</i> (Olivi,1792)	Ss	<i>Sepia officinalis</i> (Linneaus,1758)	D
<i>Cuspidaria rostrata</i> (Spengler, 1793)	Ss	<b>Sepiolidae</b>	
<b>SCAPHOPODA</b>		<i>Sepietta oweniana</i> (d'Orbigny, 1841)	D
<b>Dentaliidae</b>		<i>Sepioloa rondeleti</i> Leach, 1817	D
<i>Antalis dentalis</i> (Linneaus,1758)	Ss	<b>Loliginidae</b>	
<i>Antalis vulgaris</i> (Da Costa,1778 )	Ss	<i>Loligo vulgaris</i> (Lamarck,1798)	D
<i>Antalis inaequicostatum</i> (Dautzenberg,1891)	Hs;Ss	<b>Octopodidae</b>	
<b>Fustiariidae</b>		<i>Eledone moschata</i> (Lamarck, 1798)	D
<i>Fustiaria rubescens</i> (Deshayes 1825)	Ss	<i>Octopus vulgaris</i> (Cuvier,1797)	D
<b>Gadilidae</b>			
<i>Dischides politus</i> (S. Wood, 1842)	Ss		
<b>CEPHALOPODA</b>			
<b>Sepiidae</b>			

## Prilozi popisu vrsta faune mekušaca u Bokokotorskom zalivu (jugo-istočno Jadransko more)

Slavica PETOVIĆ

### SAŽETAK

Rad prikazuje nove vrste puževa i školjki koje su po prvi put zabilježene u Bokokotorskom zalivu kao rezultat istraživanja sprovedenog u periodu 2016-2018. Osam novih vrsta treba dodati broju od 304 vrste koje su već dokumentovane za ovo područje u nedavno objavljenom popisu vrsta faune mekušaca za Crnogorsko primorje. Istraživanja su pokazala da je marina Porto Montenegro prepoznata kao domaćin većem broju zabilježenih vrsta (*Pinctada imbricata radiata*, *Thecacera pennigera*, *Polycera elegans*, *Euspira catena* i *Discodoris rosi*). Nalaz *T. pennigera* je prvi za Jadransko more i treći za Mediteran. Među identifikovanim vrstama je *Pinna rudis* koja se nalazi na Listi ugroženih i vrsta u opasnosti (Aneks II Barselonske Konvencije) dok se *Pinctada imbricata radiata* smatra alohtonom vrstom koja je unesena u Bokokotorski zaliv.

**Ključne riječi:** mekušci, vrste bentosa, Bokokotorski zaliv, jugo-istočno Jadransko more