Turkish Journal of Zoology

Volume 47 | Number 3 Article 2

1-1-2023

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Turkish Journal of Zoology

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Research Article

Turk J Zool
(2023) 47: 135-146
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doi:10.55730/1300-0179.3125

# New records of gastropods (Caenogastropoda and Heterobranchia) from the Turkish coasts with observations on some poorly known species

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**Received:** 06.12.2022 • **Accepted/Published Online:** 19.04.2023 • **Final Version:** 04.05.2023

**Abstract:** This work presents information about 19 taxa recorded from different habitats at depths between 0.2 and 508 m in the last two decades, which are new records or poorly known species along the Turkish coasts. Among the identified species, *Epitonium vaillanti*, *Melanella* cf. *lubrica*, *Melanella monterosatoi*, *Pelseneeria minor*, *Setia amabilis*, *Kurtziella serga*, *Rissoella diaphana*, *Rissoella inflata*, and *Spirolaxis clenchi* are new records for the Turkish mollusc fauna, *Eatonina pumila* is new report for the Turkish coast of the Aegean Sea, and *Eatonina ochroleuca*, *Acirsa subdecussata*, *Lamellaria latens*, *Setia pulcherrima*, *Setia valvatoides*, and *Turbonilla cangeyrani* are species with rare distribution which were sampled for one or a few times only. *Viriola* cf. *bayani*, *Acirsa subdecussata*, *Melanella monterosatoi*, *Eatonina ochroleuca*, *E. pumila*, *Setia amabilis*, *Setia pulcherrima*, *Lamellaria latens*, *Rissoella diaphana*, *R. inflata*, and *Syrnola* sp. were encountered along the Aegean Sea coast, whereas *Epitonium vaillanti*, *Pelseneeria minor*, *Rissoidae* sp., *Kurtziella serga*, *Turbonilla cangeyrani*, and *Spirolaxis clenchi* were recorded on the Levantine coast of Turkey, and *Melanella* cf. *lubrica* in the prebosphoric region of the Sea of Marmara. *Setia valvatoides* is the only species found on the Turkish Black Sea coast. On the other hand, *Epitonium vaillanti* and *Viriola* cf. *bayani* are species originated outside the Mediterranean basin. Most of the species were found at infralittoral and circalittoral depths, except for *Kurtziella serga* and *Spirolaxis clenchi* found at a depth of 508 m. The present study elucidates some ecological and distinguishing characteristics of the investigated species, along with their colour photographs and distribution along the Turkish coasts.

**Key words:** New records, Gastropoda, Turkish coasts, ecology, distribution

## 1. Introduction

Mollusca are comprised by about 120,000 species and the phylum is one of the most diverse animal taxa occurring in all ecosystems of the planet. It is also the leading phylum concerning endangered and vulnerable species (Haszprunar, 2020). As in the worldwide, in the Mediterranean Sea, the phylum is also one of the most species-rich taxa distributed from the tidal zone up to bathyal depths and, among macro-invertebrates, this phylum outnumbers all other taxonomic groups, with more than 2000 registered taxa (Coll et al., 2010). Nowadays, this number is estimated to be increased to about 2500 species by description of new taxa or by introduction of species of alien origin which, by December 2021, was 230 species (including established and casual taxa only) (Zenetos et al., 2022). Among the molluscs, the gastropods dominate by comprising about 80% of the extant taxa (Haszprunar, 2020).

On the molluscs distributed along the Turkish coasts, although some studies dated the previous centuries, most of them were carried out in the late 20th and early 21st centuries. The first report of mollusc species from the Turkish coasts can be found in the work by Forsskål (1775), where some species (*Tritia reticulata*, *Arca noae*, *Pinna nobilis*, *Solecurtus strigilatus*, and *Octopus vulgaris*) were reported from the İzmir Bay and Sea of Marmara, and the species given by Forsskål (1775) seem to be the first registered marine taxa from the Turkish coasts. After that time, although some studies were carried out (i.e. Forbes, 1844; Colombo, 1885; Marion, 1898), an increase in the number of scientific studies can be observed both at the beginning and towards the end of the 20th century. However, the huge leap in the number of studies there happened in the last 2 decades (i.e. Öztürk and Ergen, 2000; Öztürk and Bitlis-Bakır, 2013; Doğan et al., 2016; Bitlis and Öztürk, 2017; Boyer et al., 2020; Öztürk and Geyran, 2020; Öztürk, 2021), of which a part was carried out on alien molluscs (i.e. Çevik and Öztürk, 2001; Çınar et al., 2006; Öztürk and Can, 2006; Öztürk and Aartsen,

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2006; Öztürk, 2012; Öztürk et al., 2015, 2017). The marine mollusc taxa dealt with in all these studies have been subject to several checklists (i.e. Albayrak, 2011; Çınar et al., 2011; Öztürk et al., 2014; Çınar et al., 2021) and, in a way, an inventory list of known mollusc species from the Turkish coasts was obtained. According to the checklist by Öztürk et al. (2014), 1065 species were distributed on the Turkish coasts. However, with the studies performed after the checklist had been published, now the number is estimated to be more than 1100. Among the listed species, parallel to the worldwide situation, gastropods dominate with 706 species, followed by bivalves (279 species) and cephalopods (50 species). The total number of mollusc species found in seas surrounding Türkiye ranged from 155 species (Black Sea) to 825 species (Aegean Sea) (Öztürk et al., 2014). On the other hand, 123 mollusc species known from the Turkish coasts originated outside the Mediterranean Sea (Çınar et al., 2021).

The present study dealing with the gastropod species contributed to the Turkish marine mollusc fauna with nine new taxa.

## 2. Materials and methods

The gastropod specimens investigated in the present study were found during various cruises or within different research projects conducted along the Turkish coasts in the last years. They were sampled from heterogeneous substrata (sand, mud, mixture of sand and mud, algae species, phanerogams, sponges and rocky bottoms) and different depths between 0.2 and 508 m of the seas surrounding Türkiye (Figure 1).

The materials from deep bottoms were taken by means of a dredge, van Veen Grap and box core, while the materials from the shallow depths (0–10 m) were collected by snorkeling and hand picking (stations 2, 6, 8, 13, and 20).

The studied materials were deposited at the Museum of Faculty of Fisheries, Ege University, İzmir, Türkiye (ESFM).

## 3. Results and discussion

During the examination of large-quantity benthic materials in recent years, along with the other known mollusc species, 19 gastropods species (*Viriola* cf. *bayani*, *Acirsa subdecussata*, *Epitonium vaillanti*, *Melanella* cf. *lubrica*, *Melanella monterosatoi*, *Pelseneeria minor*, *Eatonina ochroleuca*, *Eatonina pumila*, *Setia amabilis*, *Setia pulcherrima*, *Setia valvatoides*, Rissoidea sp., *Lamellaria latens*, *Kurtziella serga*, *Rissoella diaphana*, *Rissoella inflata*, *Syrnola* sp., *Turbonilla cangeyrani*, and *Spirolaxis clenchi*) were identified, being recorded for the first time from the Turkish coasts or poorly known from one or a few records only. Of the species mentioned above, *Epitonium vaillanti*, *Melanella* cf. *lubrica*, *Melonella monterosatoi*, *Pelseneeria minor*, *Setia amabilis*, *Kurtziella serga*, *Rissoella diaphana*, *Rissoella inflata*, and *Spirolaxis clenchi* are new records from the Turkish coasts, and *Eatonina pumila* is new report from the Turkish Aegean coast. The remaining species (*Acirsa subdecussata*, *Eatonina ochroleuca, Lamellaria latens*, *Setia pulcherrima*, *Setia valvatoides*, and *Turbonilla cangeyrani*) are with rare distribution detected for one time or a few times only. The specimens of two taxa (Rissoidae sp. and




**Figure 1.** Map of the localities from where the species were recorded.

*Syrnola* spp.) could not be assigned to species level. These two taxa have been included to be introduced only. All the identified species belong to subclass Caenogastropoda, except for *Turbonila cangeyrani* and *Spirolaxis clenchi*, which are considered within the subclass Heterobranchia. As for the distributional depths, some of the studied species were found at shallow depths (0.2–16 m), except for *Viriola* cf. *bayani*, *Acirsa subdecussata*, *Epitonium vaillanti*, *Melanella* cf. *lubrica*, *Melanella monterosatoi*, *Pelseneeria minor*, *Eatonina ochroleuca*, *Lamellaria latens*, *Rissoella inflata*, and *Syrnola* sp., found at depths up to 68 m. *Kurtziella serga* and *Spirolaxis clenchi* were the species with the deepest distribution, recorded at a depth of 508 m. The habitat preferences of the studied species are mostly soft substrata, except for *Eatonina pumila*, *Setia amabilis*, *Setia pulcherrima*, *Setia valvatoides*, and *Rissoella diaphana* encountered in environments dominated by *Cystoseira* spp. or *Posidonia oceanica*.

Some taxonomic, ecologic, and distributional features of the studied species have been noted below:

**Caenogastropoda Cox, 1960**

**Triphoridae Gray, 1847**

*Viriola* cf. *bayani* Jousseaume, 1884

(Figures 2A–2C)

*Viriola bayani* Jousseaume, 1884: 238.

**Material:** Sta. 14, 17.10.2017, Marmaris Bay (Selimiye), Aegean Sea, 36°40′39.270″ N–27°58′14.800″ E, coarse sand with *Halophyla* sp., 25 m, 1 spm (ESFM–GAS/2017–71).

The shell of the species is quite different from that of the other Mediterranean triphorid species with its smooth spiral cords. Moreover, the shell is characteristic with its colour pattern of white fletches on brown background and in the sculpture of two main spiral cords and another one between them weaker than two other ones. Earlier Mediterranean records were investigated in detail by Steger et al. (2018).

Along the Turkish coasts, it was previously recorded by Stamouli et al. (2017) from İztuzu and identified as *Viriola* cf. *corrugata*. The species is also known from the Greek and Israeli coasts (Steger et al., 2018) and, being reported for several times, it is evaluated as an established alien species in the region.

**Epitoniidae Berry, 1910**

*Acirsa subdecussata* (Cantraine, 1835)

(Figures 2D and 2E)

*Scalaria subdecussata* Cantraine 1835: 388.

**Materials:** Sta. 9, 23.11.2008, İzmir Bay, Aegean Sea, sand, 76 m, 1 spm (ESFM–GAS/2008–03); Sta. 4, 06.06.2013, Dardanelles, muddy sand, 50 m, 2 spm (ESFM–GAS/2013–128).

Shell solid and turreted, with slightly convex teleoconch whorls, of which the first whorls with axial ribs only. They then weaken towards the lower whorls and, on the body and penultimate whorls, distantly disposed incised striae become more evident. Some shells are with varices on the last whorls. In light or brownish colour.

Along the Turkish coasts, the species was previously recorded in Dardanelles by Marion (1898) and, long after, one specimen was found in İzmir Bay at a depth of 76 m and two specimens in Dardanelles at 50 m depth, whose records were reported by Öztürk et al. (2014), but no image was provided. Along with the Mediterranean Sea, the species is also distributed in the eastern Atlantic Ocean and on the Australian coast of the Coral Sea (WoRMS, 2022)[1].

*Epitonium vaillanti* (Jousseaume, 1912)

(Figures 2F–2H)

*Avalitiscala vaillanti* Jousseaume, 1912: 223–224, Pl. 7, figs. 6, 28–36, 40–44.

**Materials:** Sta. 21, 18.08.2016, Samandağ (Hatay), Levantine Sea, mud with shell fragments, 50 m, 1 spm (ESFM–GAS/2016–39); Sta. 19, 25.08.2021, Mersin Bay, Levantine Sea, sandy mud, 18 m, 1 spm (ESFM–GAS/2021–36).

Shell consists of about 5 convex teleoconch whorls and a protoconch of nearly 4 slightly convex whorls. Teleoconch surface bears 8–9 prosocline axial ribs, slightly reflexed on shoulder. Suture deep, aperture ovate, peristome thin, and umbilicus less evident. White in colour. The species was investigated in detail by Bonfitto et al. (2021).

*Epitonium vaillanti* was originally described on specimens recorded from Suez, Aden, and Djibouti (Jousseaume, 1912: 223); later, it was reported from the Gulf of Aqaba (Singer 1998: 19) and from the Yemeni coasts of the Red Sea (Abubakr, 2004: 69). Since September 2015, *E. vaillanti* was also recorded from the Mediterranean Sea, in different localities and habitats along the Israeli coast (Bonfitto et al., 2021). In June 2016, a shell was found on the eastern Levantine coast of Türkiye (Samandağ, Hatay) at a depth of 50 m in a soft substrate habitat, and in August 2021 in Mersin Bay, a live specimen was recorded at a depth of 18 m. The species, being found multiple times in different localities, is evaluated among the established alien species in the Mediterranean Sea.

**Eulimidae Philippi, 1853**

*Melanella* cf. *lubrica* (Monterosato, 1890)

(Figures 2I–2K)

*Asicularia lubrica* Monterosato, 1890: 159.

**Material:** Sta. 3**,** 24.06.2013, Sea of Marmara (40°56′58″N–28°51′39″E) sandy mud with *Lithothamnion* sp. fragments, 25 m, 1 spm (ESFM–GAS/2013–167).

Shell straight, broadly conical, with 9 slightly convex teleoconch whorls. Suture distinct. Body whorl not angulated at periphery and consists of about more than 1/3 of the total height. On the teleoconch, whorls completely smooth. Aperture occupies half height of the body whorl

and, on the columellar side, a bit angulated, outer lip from side view with smooth curve. White-corneous in colour. One specimen was sampled only from the prebosphoric region of the Sea of Marmara.

The specimen having some similarities with *Melanella lubrica* in general shape of the shell and outline of the outer lip was temporarily assigned to this taxon. However, we did not detect any spiral micro-sculpture on the whorls as there was indicated in the literature (Bouchet and Waren, 1986: 362) for *Melanella lubrica*. It also differs from the representatives of *Melanella polita* by being broadly conical and with less convex whorls versus nearly flat whorls and narrower conical shell in *M. polita*.

*Melanella monterosatoi* (Monterosato, 1890)

(Figures 2L–2O)

*Acicularia monterosatoi*; Monterosato, 1890: 140–151.

**Material:** Sta. 10, 25.11.2016, Ildır Bay, Aegean Sea, mud, 25 m, 2 spm (ESFM–GAS/2016-36).

Shell small, almost straight, and with 8–9 smooth teleoconch whorls. Spire whorls flat, body whorl round at the periphery. Incremental scars are obvious on the last whorls. Suture slightly oblique. There is a false subsuture and subsutural area is evident. Aperture nearly half of height of body whorl ovate and triangular adapically. Columella very slightly inclined to the right adapically and forming an obtuse angle with the parietal wall. Outer lip is slightly concave below the suture and most projecting part situated at the lower 1/3. White corneous in colour.

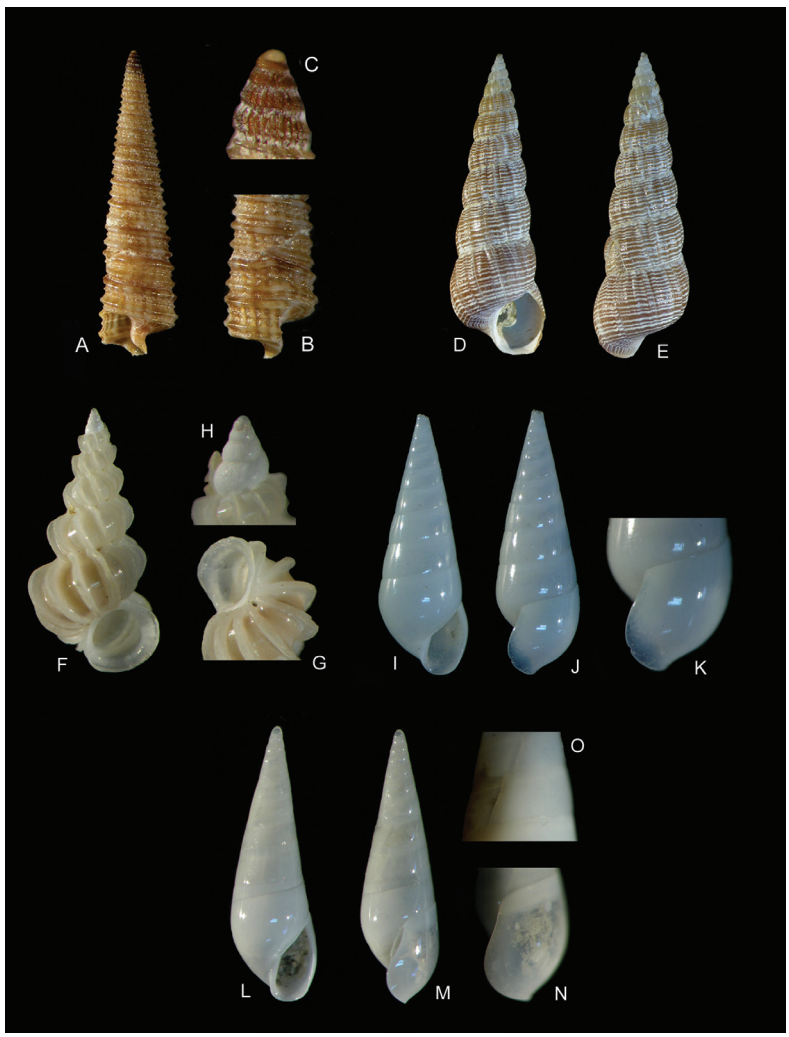



**Figure 2.** A–O. *Viriola* cf. *bayani*: ventral (A) and dorsal (B) views of the found specimen and its protoconch (C), A = B = 6.9 mm; *Acirsa subdecussata*: ventral (D) and dorsal (E) views of a specimen, D = E = 13.2 mm; *Epitonium vaillanti*: ventral views of a specimen (F, G) and its protoconch (H), F = 3.8 mm; *Melanella* cf. *lubrica*: ventral (I) and lateral (J) views of the found specimen and its outer lip (K), I = J = 8.4 mm, and *Melanella monterosatoi*: ventral (L) and lateral (M) views of a specimen, its outer lip (N) and incremental scars (O). (L = M = 3.5 mm).

*Melanella monterosatoi* is known from the eastern Atlantic and the Mediterranean Sea (Cachia et al., 1996; Öztürk et al., 2004). Recently it was reported from the Hellenic Seas by Mbazios et al. (2020). The present record is the first one from the Turkish coasts.

*Pelseneeria minor* Koehler & Vaney, 1908

(Figures 3A–3C)

*Pelseneeria minor* Koehler and Vaney, 1908: 1–16.

**Material:** Sta. 18, 20.10.2017, Gazipaşa, Antalya Bay, Levantine Sea, sandy mud, 56 m, 1 spm (ESFM–GAS/2017–74).

Shell of three convex teleoconch whorls, pyriform in outline. Body whorl oval-shaped and more than 2/3 of the total height. Suture deep. Aperture semicircular and rounded in lower part. Columella arched, umbilicus evident. Outer lip thin and sharp. Protoconch more than three whorls, cylindrical in shape and dark brown in colour. As the other eulimids, the species is probably ectoparasite on some echinoderm species. *Pelseneeria minor* dealt with herein is the first record from the Turkish coasts.

**Cingulopsidae Fretter & Patil, 1958**

Along the Turkish coasts, the family is represented by two species only within the genus *Eatonina*, although from the European coasts, about 50 species are known including three genera: *Eatonina* (Thielle,1912) *Pseudopisinna* (Ponder & Yoo, 1981), and *Tubbreva* (Ponder, 1965) (WoRMS, 2022)[1]. *Eatonina ochroleuca* and *E. pumila* are extremely small shelled molluscs, even at the adult stage, and can be rarely encountered within the studied materials.

*Eatonina ochroleuca* (Brusina, 1869)

(Figures 3D–3F)

*Setia ochroleuca* Brusina, 1869: 247.

**Material:** Sta. 12, 07.08.2017, Gökova Bay, Aegean Sea, muddy sand with algae fragments, 49 m, 3 spm (ESFM–GAS/2017–67).

The shell in light brown colour and completely smooth. It is characteristic with white spots on the teleoconch whorls. Three specimens have been found in a sandy muddy material taken in Gökova Bay (Aegean Sea) at a depth of 49 m.

The species was previously reported from the Turkish Aegean coast (Okuş et al., 2006) and Sea of Marmara (Demir, 2003), but it was not illustrated.

*Eatonina pumila* (Monterosato, 1884)

(Figure 3G)

*Setia pumila* Monterosato, 1884: 74.

**Material:** Sta. 13, 03.05.2017, Datça, Aegean Sea, *Cystoseira* sp., 0.2 m, 2 spm (ESFM–GAS /2017–72).

The species differs from its congeneric *E. ochroleuca* by its shell in globose shape and brown narrow stripes evident on the body whorl. The umbilical zone is also in dark brown colour.

The species mostly occurs on detritic bottoms and algal habitats of the infralittoral zone. Along the Turkish coasts, *E. pumila* was previously reported from the Levantine coast only by Buzzurro and Greppi (1996). The present record is a new one for the Aegean Sea coast of Türkiye.

**Rissoidae Gray, 1847**

*Setia amabilis* (Locard, 1886)

(Figures 3H–3K)

*Cingula amabilis* Locard, 1886: 266.

**Material:** Sta. 6, 14.05.2017, Tavşan Island (near the entrance of the Dardanelles), Aegean Sea, *Cystoseira* sp., 0.5 m, 3 spm (ESFM–GAS /2017–66).

Shell thin and consists of about 4–4.5 glossy convex whorls. Protoconch with no sculpture. Last whorl about 2/3 of total height. Suture deep. Aperture round and nearly 1/3 of the total height. Outer lip not thickened, umbilicus evident. On the last whorl usually, there are three spiral rows of brown spots, of which the bottom two rows are closer together. The species is similar to *Setia pulcherrima*, but the last species is more spherical and there are four rows of brown spots on the last whorl. *Setia amabilis* dealt with herein is the first record from the Turkish coasts.

*Setia pulcherrima* (Jeffreys, 1848)

(Figure 4A–4C)

*Rissoa pulcherrima* Jeffreys, 1848: 351.

**Materials:** Sta. 6, 14.05.2017, Tavşan Island (near the entrance of the Dardanelles), Aegean Sea, *Cystoseira* sp., 0.5 m, 3 spm (ESFM–GAS/2017–63); Sta. 7, 28.07.2017, Çandarlı Bay, Aegean Sea, *Cystoseira* sp., 0.5 m, 1 spm (ESFM–GAS/2017–64).

Shell globose-conical and consists of 4 glossy convex teleoconch whorls. Body whorl about 2/3 of the total height. Protoconch evident and sometimes, in fresh specimens, with thin less obvious spiral cords. Aperture round, columella arched and a bit turned over the umbilicus. Outer lip simple. Umbilicus evident and deep. On the last whorl, 4 spiral rows of brown spots, which are characteristic, differ the species from *Setia amabilis*, having 3 spiral rows of brown spots. Along the Turkish coasts, the species was previously reported by Çulha et al. (2010) from the Black Sea, but, later on, it was considered a doubtful record (Öztürk et al.,2014).

*Setia valvatoides* (Milaschewitsch, 1909)

(Figures 4D and 4E)

*Rissoa valvatoides* Milaschewitsch, 1909

**Materials:** Sta. 2, 16.09.1999, Sinop, Black Sea, 0.5 m, *Cystoseira* sp., 1 spm (ESFM–GAS/1999–7); Sta. 1, 03.05.2021, Arhavi, Black Sea, 16 m, sandy mud, 3 spm (ESFM–GAS/2021–2).

Shell of very small size, spheroidal or a bit conical, in some specimens shorter spire, and blunted apex. Teleoconch whorls are convex and smooth. Suture deep. Body whorl large, roundish on the periphery and consists of about 3/4 of the total shell. Aperture round and slightly angular above. Outer lip thin, columellar side arch-like. Umbilicus mostly large and deep. Light yellow to dark in

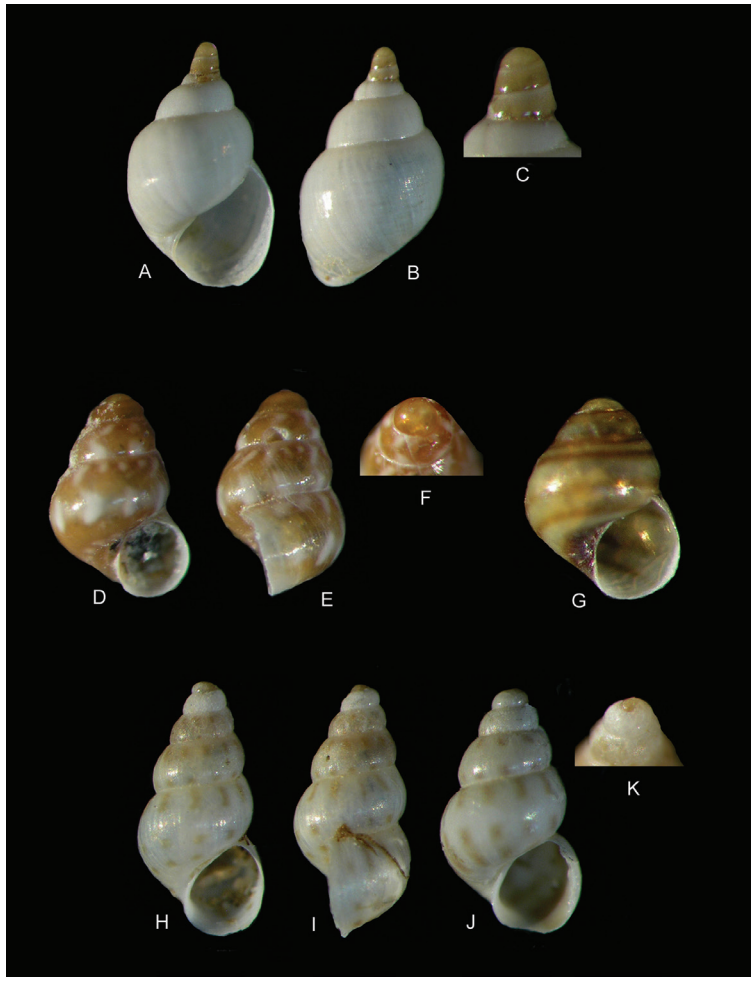



**Figure 3.** A–K. *Pelseneeria minor*: ventral (A) and dorsal (B) views of a specimen with its protoconch (C), A = B = 1.7 mm; *Eatonina ochroleuca*: ventral (D) and lateral (E) views of a specimen and its protoconch (F), D = E = 1.2 mm; *Eatonina pumila*: ventral view of a specimen, G = 1.1 mm; *Setia amabilis*: ventral (H, J) and lateral (I) views of two specimens and the protoconch (K) of the specimen H, H = I = 2.2 mm; J = 1.7 mm.

colour, with a darker apex. A spiral row of round brown spots in the centre of whorls. *Setia valvatoides* is known to be distributed in the Black Sea and Sea of Marmara. Some morphologic forms of the species are similar to *Setia turriculata*, but it differs from it by having wider and deeper umbilicus and single row of brown spots on the teleoconch whorls, especially evident on the body whorl. The photograph given by Wilke (1997: 11, fig. 3a) as *Setia* cf. *turriculata* from the Bulgarian coast is a morphotype of *Setia valvatoides*.

Rissoidae sp.

(Figures 4F–4H)

**Materials:** Sta. 20, 02.07.2007, Iskenderun Bay, Levantine Sea, sand, 0.3 m, 1 spm (ESFM–GAS/2007–35); Sta. 20, 30.07.2010, Iskenderun Bay, sandy mud, 4 m, 1 spm (ESFM–GAS/2010–34).

We were not able to identify surely these two specimens to any genus. Regarding the general characteristics of the teleoconch and protoconch, it is obvious that they are rissoids. A further anatomical study of the specimens will perhaps contribute to the identification of the specimens. Both specimens were found at shallow depths in Iskenderun Bay (Levantine Sea). Therefore, we cannot exclude that the specimens may have an origin outside the Mediterranean Sea.

**Velutinidae Gray, 1840**

*Lamellaria latens* (Müller, O. F., 1776)

(Figures 5A–5D)

*Bulla latens* Müller OF 1776: 242.

**Materials:** Sta. 15, 01.05.2017, Marmaris, Aegean Sea, sandy mud with shell fragments, 55 m, 1 spm (ESFM–GAS/2017-7); Sta. 12, 24.08.2017, Gökova Bay, Aegean

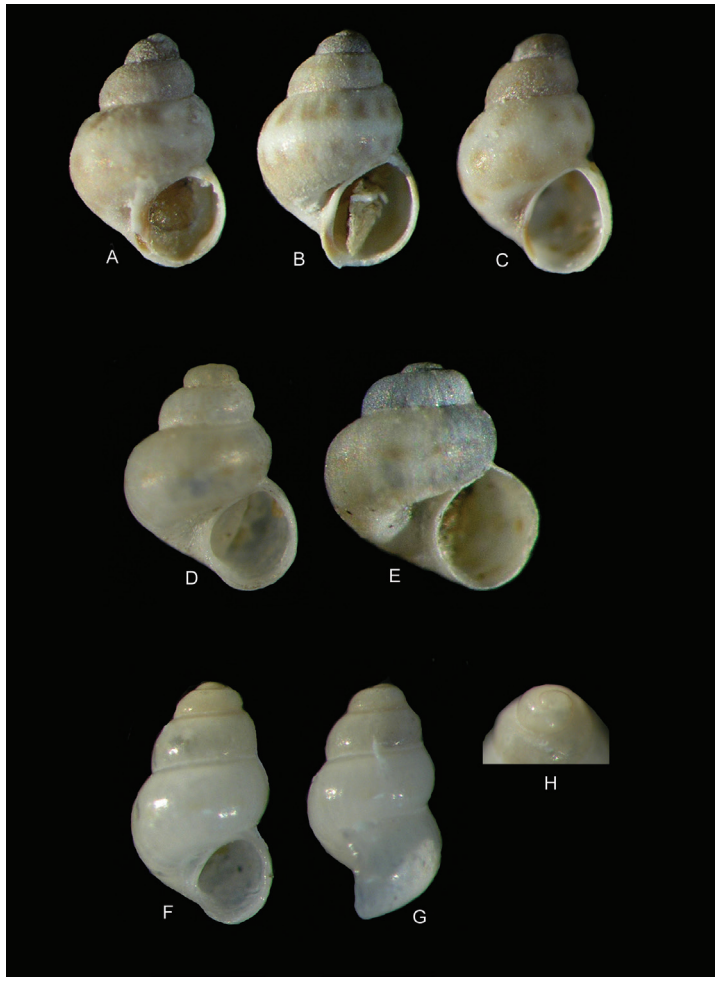



**Figure 4.** A–H. *Setia pulcherrima*: ventral views of three specimens (A–C), A, C = 1.3 mm; B = 1.4 mm; *Setia valvatoides*: ventral views of two specimens (D, E), D = 0.9 mm, E = 1.1 mm; Rissoidae sp.: ventral (F) and lateral (G) views of a specimen, and its protoconch (H), F = G = 1.2 mm.

Sea, sandy mud, 47 m, 1 spm (ESFM–GAS/2017-77); Sta. 13, 07.08.2017, Datça, Aegean Sea, muddy sand with algae, 49 m, 1 sh. (ESFM–GAS/2017–70); Sta. 10, 02.09.2018, Ildır Bay, Aegean Sea, mud with shell fragments, 63 m, 1 sh. (ESFM–GAS/2018–9).

The species has a flat shell, with two rapidly expanding whorls, spire not obvious, profile rather depressed. Aperture large. White in colour. It is mostly found under stones at depths up to bathyal zone.

The genus *Lamellaria* has two representatives along the Turkish coasts: *L. latens* and *L. perspicua*. The species dealt with herein is distinguished from *L. perspicua* by having a more rounded and larger aperture. The species was previously reported from the Turkish Aegean coast by Yokeş and Demir (2013), but not illustrated.

**Mangeliidae Fischer, P., 1883**

*Kurtziella serga* (Dall, 1881)

(Figures 5E–5H)

*Pleurotoma (Drillia) serga* Dall, 1881: 65.

**Material:** Sta. 17, 01.09.2021, Antalya Bay, Levantine Sea, mud, 508 m, 1 spm (ESFM–GAS/2021–34)

Shell of about 4.5–5 teleoconch whorls, angulated in the upper part. Suture deep. Protoconch multispiral, with thin and gibbous axial ribs similar to that of *Benthomangelia macra*, from which it differs by having more number of whorls. On the teleoconch whorls, there is a sculpture of axial ribs and granulated spirals and, on the spire whorls, two of the spirals are thicker than the others. On the body whorl, the thicker spirals are about 8–10. Aperture narrow, outer lip not thickened.

*Kurtziella serga* has some similarities with *Bela nuperrima*, but differs from it by having angulated whorls, and a different sculptured protoconch.

The species is distributed at bathyal depths up to 1980

m and is known from Mid-Atlantic and the Mediterranean Sea (Bouchet and Waren, 1980). The species is here reported from the Turkish coasts for the first time.

**Heterobranchia Burmeister, 1837**

**Rissoellidae Gray, 1850**

*Rissoella diaphana* (Alder, 1848)

(Figures 5I–5L)

*Rissoa diaphana* Alder, 1848: 97–209.

**Material:** Sta. 6, 26.07.2017, Tavşan Island (near the entrance of the Dardanelles), Aegean Sea, *Cystoseira* sp., 0.5 m, 3 spm (ESFM–GAS/2017–68).

Shell conical in shape with about 4 convex teleoconch whorls. Suture evident. Body whorl nearly 2/3 of the total height. Surface of the whorls completely smooth. Aperture almost circular in outline. Columella a bit arched, outer lip thin and umbilicus narrow. Colour vitreous in live specimens.

Three specimens were encountered only at a depth of 0.5 m in *Cystoseira* spp. facies. It lives in the mediolittoral and infralittoral zones on algae and on rhizomes of *Zostera* spp. (Scaperrotta et al., 2012: 173). The present record is the first one from the Turkish coasts.

*Rissoella inflata* (Monterosato, 1880)

(Figures 6A–6C)

*Hela inflata* Monterosato, 1880: 67–68.

**Materials:** Sta. 10, 09.05.2007, Ildır Bay, Aegean Sea, coralligenous habitat, 55 m, 1 spm (ESFM–GAS/2007–33); Sta. 8, 21.10.2016, Eski Foça, Aegean Sea, *P. oceanica*, 8 m, 1 spm (ESFM–GAS /2016–14); Sta. 8, 06.04.2017/Eski Foça, Aegean Sea, *P. oceanica*, 8 m, 1 spm (ESFM–GAS/2017–76); Sta. 5, 12.10.2017, The entrance of the Dardanelles, Aegean Sea, sand, 47 m, 1 spm (ESFM–GAS /2017–65).

Shell vitreous in aspect and spheriform, with convex teleoconch whorls. Body whorl is about 3/4 of total height.

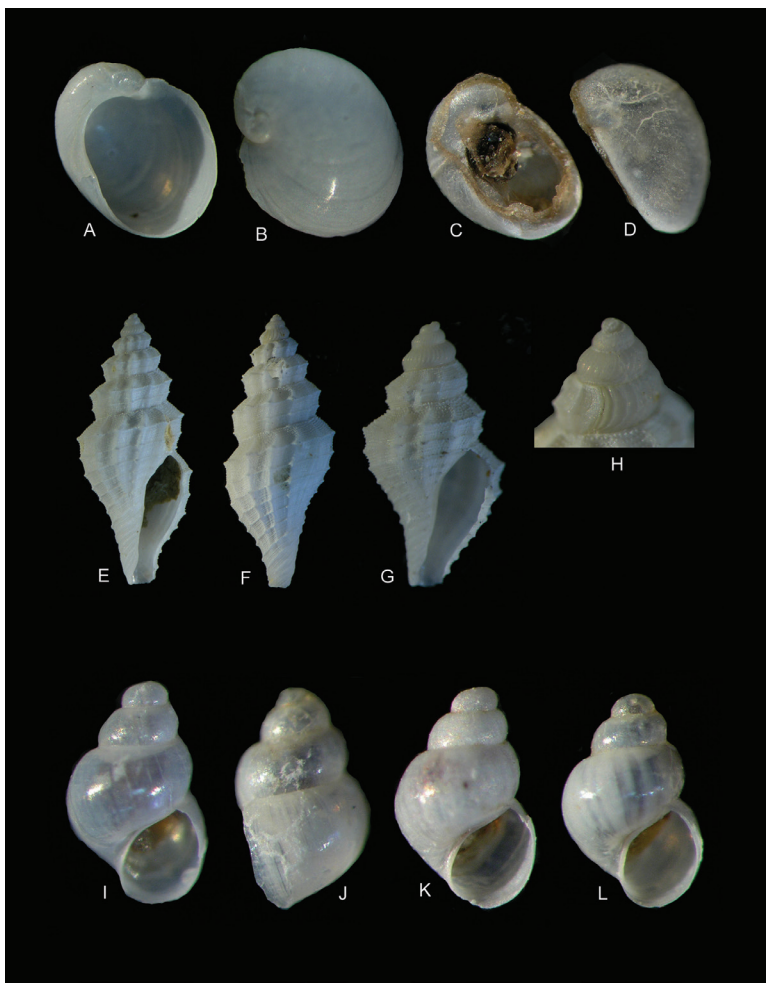



**Figure 5.** A–L. *Lamellaria latens*: ventral (A, C) and dorsal (B, D) views of two specimens, A = B = 2.5 mm; C = D = 1.9 mm; *Kurtziella serga*: ventral (E, G) and dorsal (F) views of two specimens, and the protoconch (H) of the specimen A, E = F = 8.3 mm, G = 3.9 mm; *Rissoella diaphana*: ventral (I, K, L) and lateral (J) views of three specimens, I = J = 1.15 mm; K = 0.85 mm; L = 1.1 mm.

Surface of the whorls smooth. Suture evident. Aperture semicircular, outer lip thin and columella inclined. Umbilicus narrow.

Four specimens were found in different habitats at depths between 8 and 55 m. It is more common in the western Mediterranean (Scaperrotta et al., 2012: 173). The present records of the species are the first ones from the Turkish coasts.

**Pyramidellidae Gray, 1840**

*Syrnola* sp.

(Figures 6D–6G)

**Materials:** Sta. 11, 28.08.2019, Büyük Menderes river offshore, Aegean Sea, mud, 15 m, (/ESFM–GAS/2019–7); Sta. 16, 10.09.2019, Sarıgerme (Dalyan), Aegean Sea, mud, 68 m, 2 spm (ESFM–GAS/2019–9).

Within the framework of a project, in 2019, three specimens of the genus *Syrnola*, which are different from the known Mediterranean species, were sampled. They have no resemblance to *Syrnola fasciata* and *S. cinctella*. The specimen D = E differs from *Syrnola lendix* by being a bit scalaroid and having a wide conical shell. The specimen F by its adapical part, although it is a bit similar to *S. lendix*, it also differs by being a bit scalaroid and wide conical. At the present, the identification of these specimens was possible at the genus level only. They will be examined in detail if more specimens can be found in the future.

*Turbonilla cangeyrani* Ovalis & Mifsud, 2017

(Figures 6H and 6I)

*Turbonilla cangeyrani* Ovalis and Mifsud, 2017: 1–4.

**Materials:** Sta. 20, 02.07.2014, Yumurtalık (Iskenderun Bay), Levantine Sea, sandy mud, 7 m, 1 spm (ESFM–GAS/2014-11); Sta. 20, 11.07.2018, Yumurtalık (Iskenderun Bay), Levantine Sea, sand, 7.3 m, 1 spm (ESFM–GAS/2018–7).

The species was described by Ovalis and Mifsud (2017) on a material of 26 specimens sampled from Taşucu (Levantine coast of Türkiye) in August 2016. The shell is small with spirals on the lower part of the

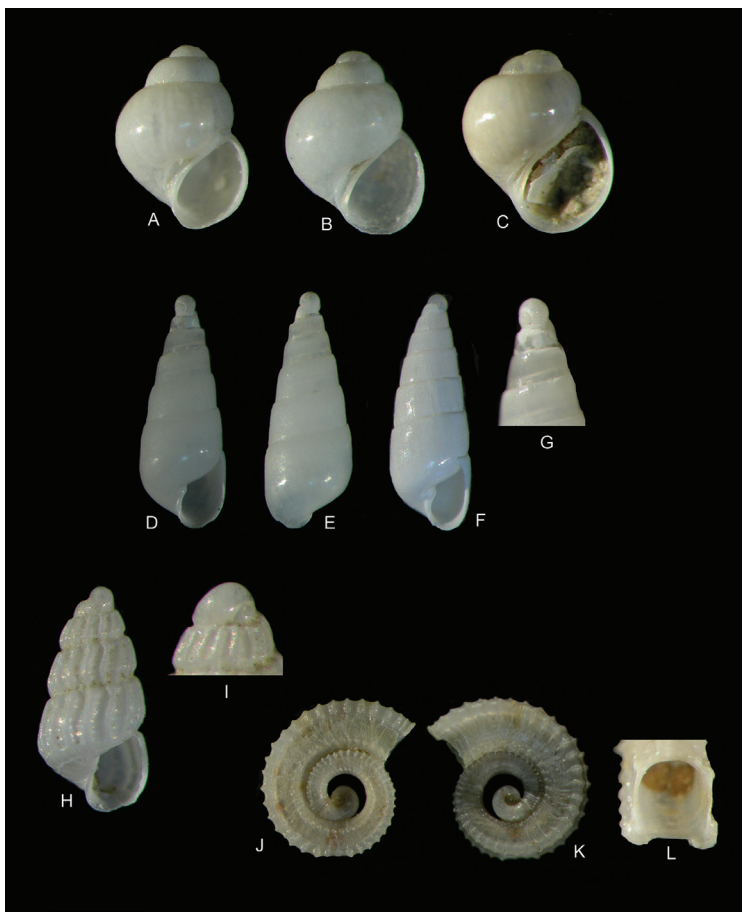



**Figure 6.** A–L. *Rissoella inflata*: ventral views of three specimens (A–C), A = 1.35 mm, B = 1.1 mm, C = 1.1 mm; *Syrnola* sp.: ventral (D, F) and dorsal (E) views of two specimens, and the apical part (G) of the specimen D, D = E = 2.2 mm, F = 2.3 mm; *Turbonilla cangeyrani*: ventral view (H) of a specimen and its protoconch (I) (H = 1.5 mm) and *Spirolaxis clenchi*: view of the found specimen from two different sides (J, K) and its aperture (L), J = K = 2.2 mm.

teleoconch whorls (three on the last whorl and two on the penultimate one) such as in *Parthenina* species, but its helicoidal protoconch is an evident distinguishing feature. Along the Turkish coasts, the species was first recorded in Yumurtalık (Iskenderun Bay, Levantine coast of Türkiye) in July 2014, but only one specimen had been found, and it was not assigned to species level.

**Architectonicidae Gray, J. E., 1850**

*Spirolaxis clenchi* Jaume & Borro, 1946

(Figures 6J–6L)

*Spirolaxis clenchi* Jaume and Borro, 1946: 13–22, pl. 2.

**Material:** Sta. 17, 01.09.2021, Antalya Bay, Levantine Sea, mud, 508 m, 1 spm (ESFM–GAS/2021–31).

Shell discoidal, teleoconch whorls separate and four keels on the whorls, which cause the cross section to be almost square. The keels are decorated with coarse and spaced granules. There is also a structure of very fine spirals and irregularly disposed growth striae. Yellowish in colour. *Spirolaxis clenchi* was originally described from the Cuban coast by Jaume and Borro (1946). The species is distributed in the North Atlantic Ocean, Caribbean Sea (WoRMS, 2022)[1] and Mediterranean Sea (Melone and Taviani, 1984). Along the Turkish coasts, one live specimen was found in Antalya Bay (Levantine coast of Türkiye), in muddy habitat at a depth of 508 m. It is known to be distributed at circalittoral and bathyal depths (Melone and Taviani, 1984).

There has been a significant increase in the number of molluscan species reported from the Turkish coasts since the first registered study carried out by Forsskål (1775) where 5 mollusc species from İzmir Bay and Sea of Marmara were reported. The number has grown to 1065 up to date since the last checklist (Öztürk et al., 2014) on marine molluscs was published. Especially, the studies by Oberling (1969–1971), Aartsen and Kinzelbach (1990), and Buzzurro and Greppi (1996) made important contributions to the increase of species number. In the last publication, only 371 species were reported, of which 292 species were gastropods, 77 species bivalves, and 2 scaphopods. After the checklist by Öztürk et al. (2014) was published, some studies carried out on different taxa such as *Raphitoma* and *Mangelia* have significantly impacted the number of known species from the Turkish coasts. In the study by Öztürk and Geyran (2020), in which 23 raphitomid species were investigated, 4 species were reported as a new record. In the work on the genus *Mangelia* (Öztürk, 2021), 18 species were investigated and, among them, *Mangelia vanaartseni* was described as a new species. There also exist some studies on alien species (Öztürk et al., 2015, 2017) having a similar impact on the increasing of the species number with reports of 5 species new for the Mediterranean Sea.

[1] WoRMS (2022). https://www.marinespecies.org/aphia.php?p=taxlist

## 4. Conclusion

It seems that the description or reports of new species will continue in the future as it was in the past. Because it is considered that there are many more species to be described. According to Appeltans et al. (2012), there exist 58,000–72,000 species that were collected but not yet described, and that 482,000–741,000 more species have yet to be sampled. A total of 135,000–164,000 marine mollusk species, of which only 28%–36% are known, are estimated to exist.

## Compliance with ethical standards

Ethical approval was not needed for this study, as the study dealt with invertebrate organisms.

## Funding

The study was partly supported financially by Scientific Research Projects (project number 111Y268) of The Scientific and Technological Research Council of Türkiye (TÜBİTAK).

## Conflict of interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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