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Heterostropha Species of the Turkish Coasts: *Anisocycla*, *Eulimella*, *Puposyrnola*, *Syrnola* and *Turbonilla* (Gastropoda, Heterobranchia)

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Abstract

The present study, including *Anisocycla*, *Eulimella*, *Puposyrnola*, *Syrnola* and *Turbonilla* genera, is the third one dealing with the species having heterostrophic protoconch distributed along the Turkish coasts, following the genus *Chrysallida* and the subfamily Odostomiinae. The material was collected in the Turkish Levantine and Aegean Seas, and the Sea of Marmara at depths varying from 0.5 to 1302 m between the years 1996 and 2012. The examination of the collected material revealed four species of *Anisocycla* (*A. gradata*, *A. nitidissima*, *A. pointeli* and *A. striatula*), five species of *Eulimella* (*E. acicula*, *E. neoattenuata*, *E. scillae*, *E. ventricosa* and *E. unifasciata*), one species of *Puposyrnola* (*P. minuta*), two species of *Syrnola* (*S. fasciata* and *S. lendix*) and twelve species of *Turbonilla* (*T. acuta*, *T. acutissima*, *T. hamata*, *T. jeffreysi*, *T. lactea*, *T. micans*, *T. paucistriata*, *T. pseudogradata*, *T.pumila*, *T. pusilla*, *T. rufa* and *T. striatula*). Of the identified species, *E. neoattenuata* forms a new record for the eastern Mediterranean, *T. paucistriata* is new report for the Levantine and Aegean Seas, *P. minuta* and *T. micans* are new ones for the Aegean Sea, *E. striatula* and *T. pseudogradata* are new records for the Turkish molluscan fauna, *T. acutissima* is a new one for the Turkish Aegean Sea fauna and Sea of Marmara and six species (*A. gradata*, *A. nitidissima*, *E. scillae*, *E. unifasciata*, *T. lactea* and *T. pumila*) are new records for the Turkish Aegean coast. Most of the identified species are distributed in littoral depths down to 100 m, whereas *E. ventricosa*, *T. micans* and *T. paucistriata* are significant as species distributed at deeper bottoms, found at depths of up to 1302 m. On the other hand, out of the 23 species encountered in this study, *T. rufa* is the most abundant species along the Turkish coasts, however *E. acicula*, *T. acuta* and *T. pusilla* are species with the widest distribution. Some ecological characteristics and taxonomic remarks, with distribution features of the species dealt with herein are also provided

Keywords: *Anisocycla*, *Eulimella*, *Puposyrnola*, *Syrnola*, *Turbonilla*, mollusca, new records, Levantine Sea, Aegean Sea, Sea of Marmara, Turkey

Türkiye Kıyıları Heterostropha Türleri: *Anisocycla*, *Eulimella*, *Puposyrnola*, *Syrnola* ve *Turbonilla* (Gastropoda, Heterobranchia)

Özet

Anisocycla, *Eulimella*, *Puposyrnola*, *Syrnola* ve *Turbonilla* genuslarını içeren bu çalışma, *Chrysallida* ve Odostomiinae türlerini kapsayan çalışmaların ardından, Türkiye kıyılarında dağılım gösteren heterostrofik protokonka sahip türler ile ilgili üçüncü araştırmadır. İncelenen materyal, 1996-2012 yılları arasında Türkiye'nin Levantine Denizi, Ege Denizi ve Marmara Denizi'nin 0,5 ile 1302 m arasında değişen derinliklerinden toplanmıştır. Örneklenen materyalin incelenmesi sonucu *Anisocycla* genusuna ait dört tür (*A. gradata*, *A. nitidissima*, *A. pointeli* ve *A. striatula*), *Eulimellla* genusuna ait 5 tür (*E. acicula*, *E. neoattenuata*, *E. scillae*, *E. ventricosa* ve *E. unifasciata*), *Puposyrnola* genusuna ait bir tür (*P. minuta*), *Syrnola* genusuna ait iki tür (*S. fasciata* ve *S. lendix*) ve *Turbonilla* genusuna ait on iki tür (*T. acuta*, *T. acutissima*, *T. hamata*, *T. jeffreysi*, *T. lactea*, *T. micans*, *T. paucistriata*, *T. pseudogradata*, *T. pumila*, *T. pusilla*, *T. rufa ve T. striatula*) saptanmıştır. Bu türlerden *E. neoattenuata* Doğu Akdeniz, *T. paucistriata* Levantine Denizi ve Ege Denizi, *P. minuta* ve *T. micans* Ege Denizi, *E. striatula* ve *T. pseudogradata* Türkiye Mollusca faunası, *T. acutissima* Türkiye'nin Ege Denizi kıyıları ve Marmara Denizi ve altı tür (*A. gradata*, *A. nitidissima*, *E. scillae*, *E. unifasciata*, *T. lactea* ve *T. pumila*) Türkiye'nin Ege Denizi kıyıları için ilk defa bildirilmektedir. Tespit edilen türlerin çoğunluğu 100 m derinliğe kadar olan kıyı bölgesinde dağılım gösterirken, 1302 m derinliklere kadar rastlanmış olan *E. ventricosa*, *T. micans* ve *T. paucistriata* ise daha derin dağılımlı türler olarak dikkat çekmektedirler. Diğer taraftan, saptanan 23 türden, *T. rufa* Türkiye kıyılarında en bol bulunan tür, *E. acicula*, *T. acuta* ve *T. pusilla* ise dört denizimizde de rastlanan en geniş dağılımlı türlerdir. Bu çalışmada, türlerin ekolojik ve taksonomik özelliklerinin yanısıra, denizlerimize göre dağılımları ile ilgili bilgilere de yer verilmiştir

Anahtar Kelimeler: *Anisocycla*, *Eulimella*, *Puposyrnola*, *Syrnola*, *Turbonilla*, molluska, yeni kayıt, Levantine Denizi, Ege Denizi, Marmara Denizi, Türkiye

Introduction

The present study on the species with heterostrophic protoconch distributed along the Turkish coasts is the third one, following the works which covered the *Chrysallida* (Öztürk *et al*., 2011) and Odostomiinae (Öztürk *et al*., 2013) species. Here we are dealing with five other genera belonging to the Pyramidellidae and Murchisonellidae (according to Bouchet and Rocroi, 2005) i. e. *Anisocycla* Monterosato, 1880; *Eulimella* Gray, 1847; *Puposyrnola* Cossmann, 1921, *Syrnola* Adams, A., 1860 and *Turbonilla* Risso, 1826.

Materials and Methods

The material and methods of the present study are quite similar to those given in Öztürk *et al*. (2011) and Öztürk *et al*. (2013). The material had been collected during various cruises or research projects held in the Turkish Levantine Sea, Aegean Sea and Sea of Marmara between 1996 and 2012, where it had been taken from depths varying between 0.5 and 1302 m. The deep Aegean Sea material was taken during cruises undertaken by *R/V Hippocampus, K. Piri Reis* and *Egesüf*. A part of the Levantine Sea material was sampled within the project 104 Y 065 supported by the Scientific and Technological Research Council of Turkey (TUBITAK), and the remaining part was obtained during various projects with different purposes, carried out in the area since 2006. (Figure 1).

Protoconch and the other classification terminology follow van Aartsen (1981, 1987) and Schander (1994). The protoconch was indicated as *helicoid*, when the nucleus was clearly protruding (such as in the shell of *T. pseudogradata*, D) and the angle between the protoconch and shell axis was nearly 90°, or as *planispiral* (=*planorbid*) when the protoconch was coiled nearly in one plane, and an angle between two axis was more than 90°. *Syrnola lendix* has a protoconch of this type. These two types of protoconchs were considered as type A (I and II) by Schander (1994). According to the same author, when the angle between the axis of the protoconch and the axis of the shell ranges from 130^o to 160^o, the protoconch is refered to type B. In this type protoconch the topwhorl usually cannot be seen being hidden in the first teleoconch whorl. Of the investigated species herein the protoconch of *P. minuta* is of this type There is also another type (C) in which the angle between two axis is almost 180^o, but within this sudy no species with protoconch of this type.

Some shell features of the identified species, such as total height (H) with ± standard errors, mean diameter (D) with ± standard errors, mean height (h) of the last whorl with ± standard errors and maximum values for each species [.....] are given in the following order: H x D – h mm [..... mm].

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The investigated specimens of each species, with individual catalogue numbers, are deposited in the museum collections of the Faculty of Fisheries (ESFM), Ege University (Izmir-Turkey).

Geographic Coordinates of Collecting Stations (Figure 1):

1: 40°34'45"N, 26°09'25"E; 2: 40°32'45"N, 26° 25' 15"E; 3: 40°33'00"N, 26°30'20"E; 4: 40°37'08"N, 26°38'17"E; 5: 40°38'23"N, 26°47'27"E; 6: 40°34' 20"N, 26°48'26"E; 7: 40°30'45"N, 26°40'45"E; 8: 40°23'46"N, 26°21'46"E; 9: 40°17'06"N, 25°45'05"E; 10: 40°11'17"N, 26° 15' 20"E; 11: 40°04'45"N, 26° 10'50"E; 12: 40°18'42"N, 27°46'18"E; 13: 40°10'40" N, 25°40'50"E; 14: 40°07'22"N, 25°39'50"E; 15: 40° 05'45"N, 25°50'45"E; 16: 39°58'50"N, 26°03'25"E; 17: 39°55'30"N, 25°50'20"E; 18: 39°39'15"N, 26°02' 00"E; 19: 39°27'10"N, 26°07'00"E; 20: 39°24'18"N, 26°39'28"E; 21: 39°15'00"N, 26°32'05"E; 22: 39°09' 30"N, 26°40'20"E; 23: 39°02'35"N, 26°43'43"E; 24: 38°53'39"N, 26°50'19"E; 25: 38°38'18"N, 26°39'08" E; 26: 38°26'00"N, 26°51'08"E; 27: 38°25'23"N, 26° 58'58"E; 28: 38°27'19"N, 27°04'09"E; 29: 38° 25' 56" N, 27°07'11"E; 30: 38°23'32"N, 26°46'59"E; 31: 38°31'33"N, 26°37'56"E; 32: 38°38'18"N, 26°39'08" E; 33: 38°44'10"N, 26°22'00"E; 34: 38°27'24"N, 26° 27'18"E; 35: 38°23'31"N, 26°27'01"E; 36: 38°20' 48"N, 26°14'15"E; 37: 38°09'30"N, 26°17'40"E; 38: 38°03'10"N, 26°56'00"E; 39: 37°59'00"N, 27°11'15" E; 40: 37°51'53"N, 27°15'29"E; 41: 37°48'00"N, 27° 16'00"E; 42: 37°38'15"N, 27°05'55"E; 43: 37°23'55" N, 27°06'52"E; 44: 37°21'00"N, 27°21'50"E; 45: 37° 19'30"N, 27°29'00"E; 46: 37°09'00"N, 27°29'30"E; 47: 37°03'50"N, 27°13'30"E; 48: 36°59'00"N, 27°05' 35"E; 49: 36°56'45"N, 27°16'32"E; 50: 36°59'00"N, 27°32'35"E; 51: 36°49'07"N, 27°52'10"E; 52: 36°39' 50"N, 27°32'30"E; 53: 36°43'16"N, 27°42'10"E; 54: 36°45'08"N, 27°47'00"E; 55: 36°42'30"N, 28°00'15" E; 56: 36°38'30"N, 28°05'15"E; 57: 36°40'31"N, 28° 09'51"E; 58: 36°44'30"N, 28°26'10"E; 59: 36°44'20" N, 28°55'43"E; 60: 36°38'40"N, 29°05'30"E; 61: 36° 26'25"N, 29°05'21"E; 62: 36°23'54"N, 29°06'05"E; 63: 36°10'22"N, 29°36'57"E; 64: 36°17'46"N, 30°09' 18"E; 65: 36°49'53"N, 30°37'08"E; 66: 36°04'28"N, 32°53'03"E; 67: 36°02'55"N, 32°53'43"E; 68: 36°11' 31"N, 33°38'28"E; 69: 36°18'51"N, 33°51'47"E; 70: 36°39'16"N, 34°26'18"E; 71: 36°44'30"N, 34°34'59" E; 72: 36°46'24"N, 34°40'13"E; 73: 36°41'38"N, 34°42'00"E; 74: 36°41'17"N, 34°49'12"E; 75: 36°43' 33"N, 34°52'11"E; 76: 36°33'59"N, 35°07'59"E; 77: 36°33'22"N, 35°34'17"E; 78: 36°31'56"N, 35°35'15" E; 79: 36°43'36"N, 35°42'44"E; 80: 36°45'59"N, 35° 47'18"E; 81: 36°45'58"N, 35°48'18"E; 82: 36°50'05" N, 35°53'54"E; 83: 36°52'23"N, 35°55'25"E; 84: 36° 54'22"N, 35°58'05"E; 85: 36°43'19"N, 36°09'29"E; 86: 36°35'36"N, 36°11'08"E; 87: 36°21'15"N, 35°44' 27"E.

Results

The examination of 546 specimens and 357 shells (with no soft part in the inside) resulted in the identification of a total of 24 species, of which four species belong to the genus *Anisocycla*: *A. gradata, A. nitidissima*, *A. pointeli* and *A. striatula*; five species to the genus *Eulimella*: *E. acicula*, *E. neoattenuata*, *E. scillae*, *E. ventricosa* and *E. unifasciata*; one species to the genus *Puposyrnola*: *P. minuta*; two species to the genus *Syrnola*: *S. fasciata* and *S.lendix* and twelve species to the genus *Turbonilla*: *T. acuta*, *T. acutissima*, *T. hamata*, *T. jeffreysi*, *T. lactea*, *T. micans, T. paucistriata, T. pseudogradata, T. pumila*, *T. pusilla, T. rufa* and *T. striatula.*

Among the *Anisocycla* species, *A. pointeli* was the commonest one sampled at 9 stations in the Aegean Sea and the Sea of Marmara (st. 12), whereas *A. gradata* was the rarest species, with one representative only, found at the station 22. *Anisocycla striatula* forms a new record for the Turkish mollusc fauna, whereas *A. gradata* and *A. nitidissima* are new reports for the fauna of the Turkish Aegean Sea.

Of the identified *Eulimella* species, *E. neoattenuata* is being new record for the eastern Mediterranean fauna and the Turkish molluscan fauna, and *E. scillae* and *E. unifasciata* are being new ones for the Turkish Aegean coast. On the other hand *E. acicula* attracted attention as a widely distributed eulimellid found in all the three studied seas. All of the eulimellid species dealt with in the present study were encountered in the Aegean Sea, whereas *E. acicula* and *E. ventricosa* were also found in the Levantine Sea.

The genus *Puposyrnola* is represented in the Mediterranean with *P. minuta* only. It was encountered two shells of the species in muddy substrate in the northern Aegean Sea at 47 m depth. According to the relevant references, the species has not been previously reported from the investigated region.

Of the *Syrnola* species, *S. fasciata* was the commonest one, especially along the Levantine coast, but also found in the Aegean Sea. *Syrnola lendix*, however, has a restricted distribution and is recorded from the Levantine Sea along the shore line from Iskenderun Bay to Antalya Bay.

Of the *Turbonilla* species dealt with herein, *T. paucistriata* forms a new record for the Levantine and Aegean Sea fauna, *T. micans* for the Aegean Sea fauna, *T. pseudogradata* for the Turkish molluscan fauna, *T. acutissima* for the Sea of Marmara and Turkish Aegean coast, and *T. lactea* and *T. pumila* for the Turkish Aegean Sea molluscan fauna. On the other hand, among the *Turbonilla* species, *T. rufa* was the most abundant and widely distributed species, found in all the three studied seas, followed by *T. acuta* recorded from the Levantine and Aegean Seas. Some species, i. e., *T. jeffreysi*, *T. lactea* and *T. micans* were encountered in the Aegean Sea only, whereas the single specimen of *T. hamata* was found in the Levantine Sea (st. 85) at 50 m depth. *Turbonilla paucistriata* was the species with the deepest distribution, sampled at depths between 183 and 1302 m in the Levantine Sea, followed by *T. micans* recorded from the Aegean Sea at 875 m depth.

Anisocycla Monterosato, 1880

For the generic name of the genus we follow van Aartsen (1995) and use *Anisocycla*, with type species *Aciculina scalarina* Deshayes, 1861, instead of *Ebala* Leach in Gray, 1847 as proposed by Warén (1994). According to Bouchet and Rocroi (2005) the genus is considered within Murchisonellidae.

The species of this genus are characteristic with their slim and elongated shell bearing striated or smooth teleoconch whorls, which are loosely coiled. The sutures are clearly inclined. The protoconch is planorbid. No umbilicus is present. A tooth or fold on the columella is also lacking.

Anisocycla gradata (Monterosato, 1878) (Figure 2)

Odostomia pointeli var. *gradata* Monterosato, 1878.

Ebala pointeli gradata; Nordsieck, 1972:121, pl. 7, fig. 8.

Ebala trigonostoma; Peñas *et al*., 1996:41, 76, Figure 86; Bogi and Galil, 1997: 43; Cachia *et al*., 2001:118, pl. 19, fig. 10.

Anisocycla gradata; Peñas and Rolán, 2001: 58, fig. 7.

Anisocycla trigonostoma; Gougerot and Feki, 1980: 36, pl. 2 figs 1-7.

Material: 28.07.2000, sta. 22, 30 m, *Posidonia oceanica* + *Caulerpa racemosa*, 1 sp.

The species has a thin elongated vitreous shell, consisting of 5-6 slightly convex teleoconch whorls. The whorls are a bit flattened down the upper suture. The protoconch is planispiral. The surface of the whorls is smooth and the growth lines are opisthocline. The last whorl occupies nearly 0.40 of the total shell height. The aperture is characteristic with its triangular shape and clearly oblique columella. The dimensions of the single specimen found are 1.9 x 0.5 - 0. 8 mm.

The nomenclatural status of the species was discussed by Peñas and Rolán (2001). The species has some similarities with *Bacteridium carinatum* (De Folin, 1869), but differs from it by its opisthocline growth lines (instead of arched ones in *B. carinatum*) and by the shape of the shell being not scalariform.

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 2001: 58). *Turkish coasts*: Levantine Sea (Buzzurro and Greppi, 1996: 8 as *Anysocycla* cf. *trigonostoma*) and Aegean Sea (the present study).

Anisocycla nitidissima (Montagu, 1803) (Figure 3)

Turbo nitidissima Montagu, 1803.

Anisocycla nitidissima; Gougerot and Feki, 1980: 25, pl. 1 figs 1-5; van Aartsen, 1994: 94, fig. 12; van Aartsen *et al*., 2000: 16; Peñas and Rolán, 2001: 60, figs 8-16.

Ebala nitidissima; Fretter *et al*., 1986 : 629, figs 439-440; Peñas *et al*., 1996: 74, figs 87- 88, 92; Cachia *et al*., 2001:117, pl. 19, fig. 7.

Material: 13.08.2000, sta. 15, 27 m, *P. oceanica*, 2 sp.; 28.07.2000, sta. 22, 30 m, *P. oceanica* + *C. racemosa*, 1 sp.; 11.09.2007, sta. 34, 45 m, muddy sand, 1 sp.; 03.10.2007, sta. 35, 25 m, sandy mud, 1 sp.; 17.09.2000, sta. 37, 37 m, *C. racemosa* + sandy mud, 2 sp.

The shell is slender and consists of 7-8 convex teleoconch whorls. The surface of all the whorls is covered by fine spirals, which differs the species from the similar *Ebala pointeli* (De Folin, 1868). The protoconch is planorbid and the growth lines are orthocline to slightly opisthocline. The last whorl consists about 0.35 of the total shell height. *Mean dimensions* (7 specimens): 2.14 (±0.08) x 0.52 (±0.01) - 0.75 (±0.02) mm [2.5 x 0.6 - 0.9 mm].

The shell characteristics and the differences of the species from *E. pointeli* were discussed by van Aartsen (1994: 94).

Distribution: Eastern Atlantic Ocean and Mediterranean Sea (Peñas and Rolán, 2001: 60). *Turkish coasts*: Levantine Sea (Buzzurro and Greppi, 1996:8), Aegean Sea (this study) and Sea of Marmara (Oberling, 1969-1971: 190).

***Anisocycla pointeli* (De Folin, 1868)** (Figure 4)

Turbonilla pointeli De Folin, 1868.

Anisocycla pointeli; Gougerot and Feki, 1980: 27, pl. 1 figs 8-9, 13-17; van Aartsen *et al*., 1984: 50, fig. 243; van Aartsen, 1994: 94, fig. 13; van Aartsen *et al*., 2000:18; Peñas and Rolán, 2001: 58, figs 3-6.

Ebala pointeli; Peñas *et al*., 1996: 75, figs 82-83, 85; Cachia *et al*., 2001:118, pl. 19, fig. 8.

Material: 03.08.2008, sta. 12, 4 m, muddy sand, 1 sp.; 03.10.2007, sta. 35, 25-61 m, sandy mud, 1 sp.; 05.02.2008, sta. 35, 25-61 m, sandy mud, 2 sp. + 1 sh.; 13.08.2008, sta. 35, 25-61 m, sandy mud, 1 sp.; 14.09.2000, sta. 36, 54 m, muddy sand, 1 sh.; 17.09.2000, sta. 47, 37 m, *Caulerpa* sp. + mud, 3 sp.; 17.09.2000, sta. 49, 31 m, sand + algae, 1 sp.; 18.09.2000, sta. 50, 47 m, *C. racemosa* + mud, 2 sp.; 20.09.2000, sta. 51, 54 m, muddy sand, 2 sp.; 21.09.2000, sta. 53, 47 m, sandy mud, 5 sp.; 21.09.2000, sta. 55, 57 m, sand, 1 sp.; 22.09.2000, sta. 57, 44 m, sand + algae, 7 sp. + 3 sh.

The shell of the species is similar to the shell of *A. nitidissima*, from which it differs with its totally smooth shell surface. It consists of 6-7 fairly convex teleoconch whorls. The protoconch has a planorbid shape, and the growth lines are prosocline. The last whorl is about 0.40 of the total shell height. *Mean dimensions* (26 specimens + 5 shells): 1.35 (±0.23) x 0.36 (±0.05) – 0.54 (±0.08) mm [2.3 x 0.6 – 0.8 mm].

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 2001: 58). *Turkish coasts*: Levantine Sea (Micali and Palazzi, 1992: 86; Buzzurro and Greppi, 1996: 8), Aegean Sea (van Aartsen and Kinzelbach, 1990: 106; Demir, 2003: 115) and Sea of Marmara (Demir, 2003: 115).

***Anisocycla striatula* (Jeffreys, 1856)** (Figure 5)

Eulimella striatula Jeffreys, 1856.

Anisocycla folini; Gougerot and Feki, 1980: 42, pl. 2 fig. 25.

Anisocycla striatula; van Aartsen, 1994: 95, fig. 14; Peñas and Rolán, 2001: 60, figs 17-18.

Ebala striatula; Bogi and Galil, 1997: 43, fig. 6; Cachia *et al*., 2001:118, pl. 19, fig. 9.

Material: 13.11.2009, sta. 29, 15 m, mud, 1 sp.; 11.11.2009, sta. 30, 26 m, sandy mud, 3 sp.; 03.10.2007, sta. 35, 25 m, sandy mud, 1 sp.; 15.09.2000, sta. 43, 71 m, mud, 1 sp.; 16.09.2000, sta. 45, 19 m, sandy mud, 1 sh.; 18.09.2000, sta. 50, 47 m, *Caulerpa* sp. + mud, 1 sp.

The shell is vitreous and consists of 5-6 teleoconch whorls, which are less convex and flattened at the upper (sub-sutural) part. The whorls surface is striated over all of their height. The protoconch is planorbid. The body whorl occupies about 0.45 of the total shell height. *Mean dimensions* (7 specimens + 1 shell): 1.94 (±0.15) x 0.52 (±0.02) - 0.90 (±0.06) mm [2.5 x 0.6 -1.10 mm].

Anisocycla striatula has also striated shell such as *A. nitidissima*, but it differs from *A. nitidissima* by having less convex and close together teleoconch whorls. On the other hand, the shell of *A. striatula* has also slightly scalaroid shape. The nomenclatural status of the species was commented by van Aartsen (1994: 95) and Peñas and Rolán (2001: 60), and the differences from *Bacteridium carinatum* (De Folin, 1869) were discussed by Bogi and Galil (1997:43). Peñas and Rolán (2001:60) stated that the identification of the species is still questionable, due to the type material in bad condition.

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 2001: 61). *Turkish coasts*: Aegean Sea (this study).

***Eulimella* Forbes MacAndrew, 1846**

The genus *Eulimella*, with type species *Eulima macandrei* Forbes, 1844 [=*Eulimella scillae* (Scacchi, 1835)], includes species with slender shells consists of from nearly flat to convex numerous teleoconch whorls. The whorls are smooth or with microscopic spiral sculpture, and sometimes a colour band is also present. The protoconch, being planispiral or helicoid, varies according to the species. No umbilicus is present.

***Eulimella acicula* (Philippi, 1836)** (Figure 6)

Melania acicula Philippi, 1836

Eulimella laevis; Warén, 1991:113, fig. 39 E, F; Schander, 1994:29, pl. 4, fig. d.

Eulimella acicula; van Aartsen, 1994: 96, fig. 15; Peñas *et al*., 1996: 33, figs 69, 75; Peñas and Rolán, 1997: 84.

Material: 04.08.2000, sta. 2, 93 m, mud, 4 sp.; 04.08.2000, sta. 3, 32-58 m, sand + mud, 3 sp.+ 5 sh.; 03.08.2000, sta. 4, 32 m, muddy sand, 4 sh.; 03.08.2000, sta. 5, 12 m, mud, 1 sp.+1 sh.; 03.08.2000, sta. 6, 20 m, sandy mud, 3 sp.+2 sh.; 03.09.2000, sta.. 8, 105 m, muddy sand, 2 sp.; 13.08.2000, sta. 11, 29 m, sand, 2 sp.; 03.08.2008, sta. 12, 4 m, mud, 1 sp.; 13.08.2000, sta. 13, 104 m, mud, 1 sp.; 13.08.2000, sta. 14, 15 m, sand, 6 sp.; 13.08.2000; sta. 15, 27 m, *P. oceanica*, 2 sp.; 29.07.2000, sta. 18, 70 m, sandy mud, 2 sp.; 29.07.2000, sta. 19, 70-90 m, sand, 1 sh.; 18.08.2000, sta. 20, 93 m, mud, 2 sp.; 28.07.2000, sta. 22, 30 m, *P. oceanica* + *Caulerpa* sp., 1 sp.; 29.07.2009, sta. 26, 49 m, mud, 1 sp.; 13.11.2009, sta. 27, 24 m, mud, 1 sp.; 29.07.2009, sta. 29, 15 m, sandy mud, 3 sh.; 30.07.2009, sta. 30, 25 m, sandy mud, 1 sh.; 14.06.2001, sta. 31, 21 m, sandy mud, 1 sp.; 01.04.2010, sta. 32, 74 m, muddy sand, 3 sp. + 1 sh.; 09.05.2007, sta. 34, 50-62 m, mud + sand, 1 sp. + 2 sh.; 25.06.2009, sta. 35, 45-50 m, sandy mud, 2 sp. + 1 sh.; 14.09.2000, sta. 36, 54 m, muddy sand, 29 sp.; 30.09.2000, sta. 39, 32 m, mud, 1 sp.+3 sh.; 08.10.2005, sta. 40, 5-25 m, sandy mud + *C. racemosa*, 1 sp.+3 sh.; 18.09.2000, sta. 48, 82 m, mud, 1 sh.; 18.09.2000, sta. 50, 47 m, *C. racemosa* + mud, 2 sp.; 11.09.2000, sta. 56, 13 m, *P. oceanica* + sand, 1 sp.; 22.09.2000, sta. 57, 44 m, sand + algae, 1 sp.; 04.02.2009, sta. 72, 13 m, mud, 5 sh.; 19.10.2009, sta. 73, 43 m, mud, 1 sp.+1 sh.; 04.08.2009, sta. 75, 9 m, mud, 1 sp.; 04.02.2009, sta. 76, 21 m, muddy sand, 1sp.; 16.01.2010, sta. 82, 3 m, sand, 2 sp.; 02.08.2009-30.07.2011, sta. 83, 3-7 m, sand + sandy mud, 3 sp. + 1 sh.

The shell is sub-cylindrical or conical and includes 7-8 teleoconch whorls varying from slightly convex to nearly flat, and according to Micali (pers. com.) possibly more species are now mixed under *E. acicula*. The surface of the whorls shows a spiral microsculpture consisting of fine regular striae. The protoconch is of helicoid type and the growth lines are clearly prosocline. *Mean dimensions* (82 specimens and 35 shells): 1.97 (±0.16) x 0.55 (±0.04) – 0.77 (±0.06) mm [3.8 x 0.9 – 1.30 mm].

The nomenclatural status of the species was commented by van Aartsen (1994: 96-98) and van Aartsen *et al*. (2000:4).

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 1997; van Aartsen *et al*., 2000). *Turkish coasts*: Levantine Sea (Micali and Palazzi, 1992: 86; Bitlis *et al*., 2012), Aegean Sea (van Aartsen and Kinzelbach, 1990: 106; Micali and Palazzi, 1992: 86), Sea of Marmara (Oberling, 1969-1971: 190; Wilke and van Aartsen, 1998: 12, 20) and Black Sea (Wilke and van Aartsen, 1998: 12, 20). *Eulimella acicula* is the most abundant species of the genus along the Turkish coasts.

***Eulimella neoattenuata* Gaglini, 1992** (Figure 7)

Eulimella neoattenuata Gaglini, 1992: 140-141, 149, fig. 143 [*nomen novum* for *E. attenuate* Monterosato, 1878 (*nomen nudum*)]; Schander, 1994: 28; Peñas *et al*., 1996: 36; Peñas and Rolán, 1999: 163, figs 29-31.

Material: 17.09.2000, sta. 49, 31 m, sand + algae, 1 sh.; 20.09.2000, sta. 52, 86 m, mud+sand, 2 sh.

The shell is elongated and conical, including teleoconch whorls having a slight depression at the centre. The protoconch is planorbid. The growth lines are nearly orthocline. Especially on young specimens the spirals are hardly visible. A brownish line at the lower part of the whorls (above the suture) is also present. The dimensions of the found shells are: 4.5 x 1.2-1.6 mm, 4.2 x 1.2- 1.6 mm and 3.1 x 1.0-1.3 mm.

The differences with closely related species were discussed by Peñas and Rolán (1999: 163). *Eulimella neoattenuata* is similar to *E. unifasciata*, from which it could be differentiated by its slightly depressed teleoconch whorls (instead of slightly convex in *E. unifasciata*), and with the colour band, which is slimmer and not dispersed.

Distribution: Eastern Atlantic (near Gibraltar strait) and Mediterranean Sea (Schander, 1994: 28; Peñas and Rolán, 1999: 163). *Turkish coasts*: Aegean Sea (the present study).

***Eulimella scillae* (Scacchi, 1835)** (Figure 8)

Melania scillae Scacchi, 1835.

Eulimella scillae, Warén, 1991: 110-111, figs 37A, 38 C; van Aartsen, 1994: 98, fig. 17; Schander, 1994: 31, pl. 3 fig. g; Peñas *et al*., 1996: 34, figs 66-68; Peñas and Rolán, 1997: 90; Cachia *et al*., 2001: 95, pl. 15 fig. 7.

Material: 04.08.2000, sta. 2, 93 m, mud, 2 sh; 08.01.2009, sta. 34, 62 m, sandy mud, 1 sp.

The species has a conical, elongated shell consisting of 10-11 flat teleoconch whorls. The protoconch is planispiral. The surface of the whorls is shiny with opisthocline growth lines (sometimes flexuous). In fresh specimens fine striae on the whorls are also noticeable under magnification. The body whorl is sub-angulated at the periphery, and the aperture is nearly quadrate. The dimensions of the biggest specimen found were 7.0 x 1.9–2.2 mm.

We include tentatively the shell found at 62 m depth (Figure 8 A, B) in *E. scillae*. The protoconch of this specimen is slightly smaller than the protoconchs of the other two specimens and the periphery of the last whorl is not angulated as in the typical specimens. In addition, its protoconch is of helicoid type, with protruding nucleus, although in the typical specimens of *E. scillae* the protoconch seems to be planorbid (Figure 8, D). The shell features of this specimen mostly correspond to those of *Eulimella superflua* (Monterosato, 1875) interpreted by Ardovini and Micali (2009).

Some information on the nomenclatural status of the species was given by Warén (1991: 110) and van Aartsen (1994: 98).

Distribution: Eastern Atlantic Ocean (Peñas and Rolán, 1997: 90; Cachia *et al*., 2001: 96). *Turkish coasts*: Aegean Sea (the present study) and Sea of Marmara (Ostroumoff, 1896: 62-77).

***Eulimella ventricosa* (Forbes, 1844)** (Figure 9)

Parthenia ventricosa Forbes, 1844.

Eulimella ventricosa; van Aartsen *et al*., 1984: 50, fig. 123; Warén, 1991: 111, figs 37 C, D, 38 D; van Aartsen, 1994: 100, fig. 21; Peñas *et al*., 1996: 36, figs 72-73, 77; Peñas and Rolán, 1997: 97; van Aartsen *et al*., 2000: 10.

Material: 04.08.2000, sta. 3, 82 m, sand + mud, 1 sp.; 03.08.2000, sta. 8, 105 m, muddy sand, 2 sh.; 02.08.2000, sta. 10, 20 m, *P. oceanica*, 1 sp.; 30.07.2000, sta. 17, 77 m, sand, 1 sh.; 29.07.2000, sta. 18, 70 m, sandy mud, 1 sh.; 29.07.2000, sta. 19, 70-90 m, sand, 2 sh; 28.07.2000, sta. 21, 53 m, sandy mud, 1 sh.; 31.09.2000, sta. 38, 41 m, sandy mud, 2 sh.; 21.09.2000, sta. 55, 57 m, sand, 1 sh.; 03.05.2010, sta. 61, 852 m, mud, 2 sp.; 10.09.2005, sta. 87, 75 m, sandy mud, 1 sp.

The species has a conical, elongated shell, which consists of 7-8 convex teleoconch whorls, which are more swollen at the lower part. The protoconch is planorbid, and the growth lines are orthocline to slightly prosocline. *Mean dimensions* (5 specimens + 10 shells): 2.47 (±0.20) x 0.78 (±0.04)–1.05 (±0.04) mm [3.2 x 1.0 – 1.20 mm].

Distribution: Eastern Atlantic and Mediterranean Sea (van Aartsen, 1994: 100-101; van Aartsen *et al*., 2000: 10; Cachia *et al*., 2001: 96). *Turkish coasts*: Levantine Sea (Bitlis Bakır *et al*., 2012: 178), Aegean Sea (Demir, 2003:115) and Sea of Marmara (Ostroumoff, 1896: 64-80; Demir, 2003:115)

***Eulimella unifasciata* (Forbes, 1844)** (Figure 10)

Eulima unifasciata Forbes, 1844:188.

Eulimella unifasciata; van Aartsen, 1994: 99, fig. 19; Peñas *et al*., 1996: 36, fig. 91; Peñas and Rolán, 1997: 94; Peñas and Rolán, 1999: 163, figs 32, 33.

Material: 14.09.2000, sta. 37, 113 m, sand, 2 sp. + 1 sh.; 23.09.2000, sta. 58, 120 m, sandy mud, 1 sh.

The shell has an elongated conical shape and consists of slightly convex or flat teleoconch whorls, which bear a golden-yellow spiral band above the suture and at the periphery on the body whorl. The protoconch is planorbid, and the growth lines are slightly opisthocline. There is a thickening on the columella, which was the reason that this species was sometimes placed erroneously in the genus *Syrnola* Adams, A., 1869. *Mean dimensions* (2 specimens + 2 shells): 5.16 (±0.21) x 1.26 (±0.06)–1.86 (±0.03) mm [5.6 x 1.4 – 1.9 mm].

Distribution: Eastern Atlantic and Mediterranean Sea (van Aartsen *et al*., 1998: 43; Peñas and Rolán, 1999: 164). *Turkish coasts*: Aegean Sea (this study). The species was originally described from the Aegean Sea by Forbes (1844:188).

***Puposyrnola* Cossmann, 1921**

The genus *Puposyrnola*, with type species *Auricula acicula* Lamarck, 1804, includes species with shell of pupoidal shape. It is represented in the Mediterranean with one species only.

***Puposyrnola minuta* (Adams, H., 1869)** (Figure 11)

Syrnola minuta Adams, H., 1869.

Eulimella minuta; Peñas and Rolán, 1997: 96.

Puposyrnola minuta; van Aartsen, 1994: 93, 107, fig. 10; Peñas *et al*., 1996: 38, figs 89, 90, 93; Cachia *et al*., 2001: 94, pl. 15 fig. 3.

Syrnola minuta; Oliverio, 2008: 276.

Material: 03.08.2000, sta. 7, 47 m, mud, 2 sh.

The specimens belonging to this species has a shell with pupoidal shape and consists of 5-6 teleoconch whorls. The shells vary in slenderness. Growth lines are clearly prosocline. In some shells, especially on the first teleoconch whorls, there is a less visible axial sculpture. Protoconch is of type B. There is a fold on the columella. The parietal calus extends over the columellar edge and no visible umbilicus or umbilical groove. As it is indicated by van Aartsen *et al*. (1998), the golden-yellow band is rarely present in empty shells. The mean dimensions of the found two specimens are 3.1 x 0.9-1.4 mm and 3.0 x 0.9 -1.4 mm.

Beforehand the species was considered in the genus *Syrnola* and then it has been placed in *Puposyrnola* by van Aartsen (1994) and Peñas *et al*. (1996:38).

Distribution: Eastern Atlantic and Mediterranean Sea (van Aartsen *et al*., 1998:40). *Turkish coasts*: Aegean Sea (the present study).

***Syrnola* Adams, A., 1860**

The species of the genus *Syrnola* are characterized by a slender and smooth shell, which is polished and has a prominent columellar tooth. The representatives of the genus are alien species known in the Mediterranean since 1958.

***Syrnola fasciata* Jickeli, 1882** (Figure 12)

Syrnola solidula var. *fasciata* Jickeli, 1882.

Syrnola fasciata; van Aartsen, 1994: 94; Nofroni and Tringali, 1995: 40, 42, fig. 25; Zenetos *et al*., 2003: 152.

Syrnola massauensis; Micali and Palazzi, 1992: 86-87; Nofroni and Tringali, 1995: 41.

Material: 19.09.2003, sta. 28, 10-12 m, muddy sand, 2 sp. + 1 sh.; 30.09.2000, sta. 39, 32 m, mud, 1 sh.; 08.10. 2005, sta. 40, 5 m, sandy mud + *C. racemosa*, 3 sp. + 1 sh.; 17.09.2000, sta. 47, 37 m, *C. racemosa* + sandy mud, 1 sh.; 06.10.2005, sta. 60, 10 m, *P. oceanica*, 1 sp.; 03.10.2005, sta. 62, 9 m, *P. oceanica*, 1 sp.; 27.09.2005, sta. 65, 25 m, muddy sand, 1 sh.; 23.09.2005, sta. 66, 10 m, muddy sand, 1 sp.; 23.09.2005, sta. 67, 25 m, *Caulerpa prolifera* + muddy sand, 1 sh.; 19.09.2005, sta. 69, 4 m, *Halophila stipulacea*, 1 sp.; 03.02.2009, sta. 71, 20 m, mud, 1 sp. + 1 sh.; 17.09.2005, sta. 72, 10-13 m, mud, 1 sp.; 04.02. 2009, sta. 72, 10-13 m, mud, 1 sp. + 6 sh.; 21.10.2009, sta. 74, 38 m, mud, 2 sp. + 1 sh.; 04.02.2009-20.10.2009, sta. 75, mud, 9 m, 32 sp. + 65 sh.; 10.09.2005, sta. 78, mud, 50 m, 1 sp.; 10.09.2005, sta. 79, 9-25 m, muddy sand, 47 sp.; 09.09.2005, sta. 81, 25 m, sandy mud, 1 sh.; 17.10.2009, sta. 82, 7 m, muddy sand, 3 sp.; 23.07.2008-30.07.2010, sta. 83, 3-7 m, sand, sandy mud and muddy sand, 3-7 m, 31 sp.; 09.09.2005, sta. 85, 50 m, sandy mud, 2 sh.; 09.09.2005, sta. 86, 8 m, mud, 1 sp. + 1 sh.

The species has a broadly conical shell with 7-8 teleoconch whorls. The surface of the whorls is smooth and bears brown-yellow spiral bands. The growth lines are slightly prosocline, and the protoconch is planispiral. There is a strong tooth on the columella. *Mean dimensions* (129 specimens + 83 shells): 3.70 (±0.26) x 1.44 (±0.07)–1.86 (±0.09) mm [6.3 x 2.2 – 2.8 mm].

Distribution: Indo-Pacific and Mediterranean Sea (Zenetos *et al*., 2003: 153). *Turkish coasts*: Levantine Sea (Micali and Palazzi, 1992: 86; Buzzurro and Greppi, 1996: 6) and Aegean Sea (Öztürk and Can, 2006). *Syrnola fasciata* is known to be present in the Mediterranean since 1958 (van Aartsen *et al*., 1989).

***Syrnola lendix* (Adams, A., 1863)** (Figure 13)

Styloptigma lendix Adams, A., 1863

Styloptigma beatrix; Micali and Palazzi, 1992: 86-87, pl. 1 fig. 4; Bogi and Galil, 1997: 44-45, figs 11-12; Zenetos *et al*., 2003: 146.

Syrnola lendix; van Aartsen and Goud, 2006: 164-166.

Material: 08.09.2011, sta. 65, 17 m, mud, 1 sp.; 03.02.2009, sta. 71, 20 m, muddy sand, 2 sh.; 04.08.2009, sta. 72, 14 m, sandy mud, 1 sp.; 03.02.2009, sta. 73, 47 m, mud, 3 sh.; 03.08.2009, sta. 73, 47 m, mud, 1 sp.; 29.04.2009, sta. 75, 9 m, mud, 2 sp. + 1 sh.; 04.08.2009, sta. 75, 9 m, mud, 3 sp. + 2 sh.; 05.08.2009, sta. 76, 21 m, muddy sand, 1 sh.; 23.07. 2008, sta. 83, 7-24 m, sand, 1 sh.; 30.07.2010, sta. 83, muddy sand, 7-24 m, 1 sp.; 09.09.2005, sta. 85, 50 m, sandy mud, 1 sp.

The species has an elongated conical shell, with a slightly pupoid shape, and consists of 7-8 smooth teleoconch whorls (except the body whorl, which bears hardly visible spiral lines). The protoconch is planorbid, and the growth lines are from nearly orthocline to prosocline. The tooth on the columella is clear. *Mean dimensions* (10 specimens + 10 shells): 2.56 (±0.17) x 0.70 (±0.03)–1.11 (±0.05) mm [3.4 x 0.9 – 1.3 mm].

Distribution: Persian Gulf and Mediterranean Sea (Zenetos *et al*., 2003: 147; Micali and Palazzi, 1992:87). *Turkish coasts*: Levantine Sea (Micali and Palazzi, 1992: 86-87; Buzzurro and Greppi, 1996: 8). The species was collected in the Mediterranean for the first time during the years 1988-89 (Micali and Palazzi, 1992:83). It entered the Mediterranean Sea most probably by means of the Suez Canal.

***Turbonilla* Risso, 1826**

The genus *Turbonilla*, with type species *Turbonilla costulata* Risso, 1826, includes species with rather elongated shells having planorbid or helicoid protoconchs; with axial ribs on the whorls and, rarely, spirals between the ribs; and with no evident tooth or fold on the columella.

The nomenclatural status of the genus has been dealt with by Peñas and Rolán (1997: 4).

***Turbonilla acuta* (Donovan, 1804)** (Figure 14)

Turbo acutus Donovan, 1804.

Turbonilla acuta; van Aartsen, 1981: 73, pl. 3 fig. 16; Fretter *et al*., 1986: 635, fig. 433; Troncoso and Urgorri, 1990: 237-241, Peñas *et al*., 1996: 59, figs 174-175; Peñas and Rolán, 1997:12, fig. 17; Cachia *et al*., 2001: 110, pl. 18 fig. 2.

Turbonilla delicata; van Aartsen, 1981: 69, 80, pl. 3 fig. 15; Wilke and van Aartsen, 1998: 15, figs 14, 29 a-c; Cachia *et al*., 2001: 111.

Material: 13.08.2000, sta. 16, 30 m, muddy sand, 2 sp.; 28.07.2000, sta. 22, 30 m, *P. oceanica* + *C. racemosa*, 1 sp.; 01.07.2003, sta. 29, 8-11 m, mud, 1 sp.; 31.03.2010, sta. 29, 8-11 m, mud, 1 sp.;

13.04.2009, sta. 30, 23 m, mud, 1 sh.; 14.06.2001, sta. 31, 8-21 m, sandy mud + *P. oceanica*, 4 sp. + 1 sh.; 03.06.2005-08.01.2009, sta. 34, 45-60 m, mud + sand, 5 sp. + 1 sh.; 09.06.2003-16.09.2009, sta. 35, 30-60 m, sand, mud or their mixture, 17 sp. + 3 sh.; 14.09.2000, sta. 36, 54 m, muddy sand, 18 sp.; 08.10.2005, sta. 40, 25 m, sandy mud, 1 sp.; 17.09.2000, sta. 46, 44 m, sandy mud, 1 sp.; 17.09.2000, sta. 47, 37 m, *C. racemosa* + sandy mud, 1 sh.; 03.10.2005, sta. 62, 9 m, *P. oceanica*, 1 sp. + 1 sh.; 30.09.2005, sta. 64, 5 m, sandy mud with *Cymodocea nodosa*, 1 sh; 04.08.2009, sta. 75, 9 m, mud, 3 sp.; 20.10.2009, sta. 75, 9 m, mud, 2 sh.; 09.09.2005, sta. 81, 25-50 m, sandy mud, 2 sp. + 1 sh.; 31.07.2009, sta. 82, 3-10 m, muddy sand, 1 sp.; 16.01.2010, sta. 82, 3-10 m, sand, 1 sp.; 05.07.2007-30.07.2011, sta. 83, 3-9 m, sand, mud or their mixture, 3-9 m, 24 sp. + 2 sh; 09.09.2005, sta. 85, 50 m, muddy sand, 1 sh.

The shell of the species is conical or slightly cylindrical and consists of about 9-10 flat or slightly convex teleoconch whorls. The first 2-3 whorls are smooth (except for hard visible fine spirals) and the following ones are with straight, slightly opisthocline axial ribs, which are clearly broader than their interspaces. The protoconch is of the helicoid type. *Mean dimensions* (83 specimens + 15 shells): 3.97 (±0.18) x 0.99 (±0.02)-1.33 (±0.04) mm [6.5 x 1.3 - 1.9 mm].

The nomenclatural status of the species was commented by van Aartsen (1981). The author also noted that sometimes in the past the species was confused with *Turbonilla lactea* (Linnaeus, 1766). *Turbonilla acuta* can be easily distinguished from it by its helicoidal protoconch instead of planorbid one in *T. lactea*. Troncoso and Urgorri (1990) considered *T. acuta* synonymous with *T. delicata*.

Distribution: Eastern Atlantic and Mediterranean Sea (van Aartsen, 1981: 73; Peñas *et al*., 1996: 59). *Turkish coasts*: Levantine Sea (Micali and Palazzi, 1992: 86; Buzzurro and Greppi, 1996:8), Aegean Sea (Demir, 2003: 115), Sea of Marmara (Ostroumoff, 1896: 63-85; Wilke and van Aartsen, 1998: 21) and Black Sea (Wilke and van Aartsen, 1998: 21; Demir, 2003:115).

***Turbonilla acutissima* Monterosato, 1884** (Figure 15)

Turbonilla acutissima; Aartsen, 1981: 76, pl. 4 fig. 24; Peñas *et al*., 1996: 59, figs 185-186; Cachia *et al*., 2001: 111, pl. 18 fig. 3.

Material: 19.08.2008, sta. 12, 4 m, muddy sand, 1 sp.; 29.07.2009, sta. 26, 49 m, mud, 1 sp.; 26.03.2009, sta. 34, 50 m, sandy mud, 1 sp.; 25.06.2009, sta. 35, 46 m, mud, 2 sp.; 08.10.2005, sta. 40, 5 m, *C. racemosa* +sandy mud, 1 sh.; 29.09.2000, sta. 41, 11-31 m, *P. oceanica* + mud, 1 sp.; 17.09.2000, sta. 46, 44 m, sandy mud, 1 sp.; 17.09.2000, sta. 47, 37 m, *Caulerpa* sp. + sandy mud, 1 sp.; 03.10.2005, sta. 62, 9 m, *P. oceanica*, 2 sp. + 1 sh.

The shell is slender and regularly conical with flat or slightly convex 9-10 teleoconch whorls. The axial ribs are thicker than their interspaces or nearly equal to them. The protoconch is helicoid. There is a slight thickening on the columella. *Mean dimensions* (10 specimens + 2 shells): 3.69 (±0.16) x 0.94 (±0.02)–1.20 (±0.04) mm [4.6 x 1.1 – 1.5 mm].

Distribution: Mediterranean Sea (Peñas *et al*., 1996: 59; Cachia *et al*., 2001: 111). *Turkish coasts*: Levantine Sea (Bitlis Bakır *et al*., 2012: 178), Aegean Sea (this study) and Sea of Marmara (this study).

***Turbonilla hamata* Nordsieck, 1972** (Figure 16)

Turbonilla hamata Nordsieck, 1972: 125-126, 268, fig. 23.

Turbonilla gradata; van Aartsen, 1981: 70, 81, pl. 4 fig. 21; Peñas *et al*., 1996: 60, figs 182, 187; Cachia *et al*. 2001: 112, pl. 18 fig. 5.

Material: 09.09.2005, sta. 85, 50 m, sandy mud, 1 sp.

The shell is conical and characterized by its scalaroid shape. The teleoconch whorls are flat and shouldered at their adapical end. The axial ribs are opisthocline and slightly curved. The protoconch is of helicoid type. The sampled specimen has the following dimensions: 3.8 x 1.0-1.2 mm.

In the present study, according to Micali (pers. com.) the specimens with helicoid protoconch have been considered as *Turbonilla hamata* Nordsieck, 1972, although in the earlier studies they have been named as *Turbonilla gradata* B. D. D., 1883. The last species should be considered as a doubtful species until the type material is studied, because B.D.D.'s original drawing is not fitting with the normally encountered forms (Micali, pers. com.)

Distribution: Mediterranean Sea (Peñas *et al*., 1996: 60 and Cachia *et al*. 2001: 112). *Turkish coasts*: Levantine Sea.

Micali and Palazzi (1992) and Buzzurro and Greppi (1996) reported *T. gradata* from the Turkish coast of the Levantine Sea, which reports could be refered to *T. hamata*. It is one of the rarely distributed *Turbonilla* species along the Turkish coasts.

***Turbonilla jeffreysii* (Jeffreys, 1848)** (Figure 17)

Chemnitzia jeffreysii Jeffreys, 1848.

Turbonilla scalaris; van Aartsen, 1981: 67, 80, pl. 1 fig. 7.

Turbonilla jeffreysii: Peñas *et al*., 1996: 64, fig. 154; Peñas and Rolán, 1997: 53, figs 131,132; Cachia *et al*., 2001: 112, pl. 18 fig. 6.

Material: 04.08.2000, sta. 1, 8 m, *P. oceanica* + kum, 1 sp. + 3 sh.; 13.08.2000, sta. 15, 27 m, *P. oceanica*, 1 sh.; 06.10.2001, sta. 23, 4 m, *P. oceanica* + mud, 2 sp. + 1 sh.; 30.07.2009, sta. 30, 25 m, sandy mud, 1 sp.

The shell is characterized by its scalaroid shape. The teleoconch includes 7-8 flat whorls which bear prosocline axial ribs, clearly thinner than their interspaces. The area between the axial ribs is spirally striated. The protoconch is planorbid. Last whorl is about 0.45 of the total shell height. *Mean dimensions* (4 specimens + 5 shells): 5.01 (±0.36) x 1.87 (±0.09)– 2.30 (±0.11) mm [6.5 x 2.1 – 2.7 mm].

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas *et al*., 1996: 64; Peñas and Rolán, 1997: 53). *Turkish coasts*: Levantine Sea (Buzzurro and Greppi, 1996: 8; Demir, 2003: 115), Aegean Sea (Demir, 2003: 115) and Sea of Marmara (Demir, 2003: 115).

***Turbonilla lactea* (Linnaeus, 1758)** (Figure 18)

Turbo lacteus Linnaeus, 1758.

Turbonilla lactea; van Aartsen, 1981: 68, 80, pl. 3 fig. 14; van Aartsen *et al*., 1984: 54, 125, fig. 260; Fretter *et al*., 1986:633, figs 441, 442; Peñas and Rolán, 1997: 24, figs 39-43.

Turbonilla lactea campanellae; van Aartsen, 1981: 81, pl. 5 fig. 31.

Material: 13.08.2000, sta. 11, 29 m, sand, 1 sh.; 29.07.2000, sta. 18, 70 m, sandy mud, 1 sp. (+1 juv.).

The shell of the species is elongated and conical with slightly convex teleoconch whorls. The protoconch is planorbid. The axially ribs on the whorls are opisthocline, sometimes a little sinuous, and are thicker than the interspaces. On the body whorl, the interspaces are ending abruptly at the periphery. The last whorl is about 0.30 of the total shell height (the ratio is higher in young specimens). The dimensions of the adult specimens are 9.3 x 2.0-2.5 and 5.2 x 1.3-1.6 mm.

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 1997: 25; Cachia *et al*., 2001: 112). *Turkish coasts*: Aegean Sea (this study) and Sea of Marmara (Ostroumoff, 1896: 72 as *T. lactea* and p. 85, 89 as *Turbonilla elegantissma* Montagu, 1803)

***Turbonilla micans* (Monterosato, 1875)** (Figure 19)

Odostomia (Turbonilla) micans Monterosato, 1875

Turbonilla micans; Gaglini, 1992: 150, 163-164, fig. 148 (*lectotype designated*); Nofroni and Tringali, 1995: 44, figs 21-22; Peñas *et al*., 1996: 66, figs 172, 178; Peñas and Rolán, 1997: 28; Cachia *et al*., 2001: 113, pl. 18 fig. 8; Galil, 2004: 72.

Material: 15.05.2001, sta. 9, 875 m, mud, 1 sh.

The shell is sub-cylindrical with 3-4 convex teleoconch whorls. The axial ribs are orthocline and thicker than the interspaces. The protoconch is of the planorbid type, large and prominent. The last whorl comprises about the half of the shell height. The single shell showed the following dimensions: 1.7 x 0.6 - 0.8 mm.

The nomenclatural status of the species was commented by Nofroni and Tringali (1995: 44).

Distributions: Eastern Atlantic and Mediterranean Sea (Peñas *et al*., 1996: 66; Peñas and Rolán, 1997: 28). *Turkish coasts*: Aegean Sea (this study).

***Turbonilla paucistriata* (Jeffreys, 1884)** (Figure 20)

Odostomia paucistriata Jeffreys, 1884.

Turbonilla paucistriata; van Aartsen, 1981: 67, pl. 2 fig. 11; Peñas *et al*., 1996: 68, figs 156, 159; Peñas and Rolán, 1997: 6; Cachia *et al*., 2001: 113, pl. 18 fig. 10.

Material: 15.05.2001, sta. 9, 875 m, mud with detritus, 1 sh.; 12.09.2000, sta. 33, 183 m, mud, 2 sh.; 03.05.2010, sta. 63, 1302 m; mud, 1 sh.

The species has an elongate conical shell with flat or slightly concave teleoconch whorls. The axial ribs are orthocline and the protoconch is planorbid. A yellowish spiral line at the lower half of the whorls is characteristic. The height of the last whorl is between 0.30-0.40 of the total shell height, dependent on the specimens being young or adult. The two figured shells have the following dimensions: 6.3 x 1.8-2.5 mm and 5.3 x 1.6 -2.2 mm.

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 1997: 6; Cachia *et al*., 2001: 113). *Turkish coasts*: Levantine and Aegean Seas (this study).

***Turbonilla pseudogradata* Nordsieck, 1972** (Figure 21)

Turbonilla (Graciliturbonilla) pseudogradata; Nordsieck, 1972: 126, pl. P5 fig. 25 (*nomen novum* for *Turbonilla gradata* Monterosato, ms. non B.D.D, 1883).

Turbonilla pseudogradata; van Aartsen, 1981: 70, 81, pl. 4 fig. 19; Peñas *et al*., 1996: 70, fig. 176; Peñas and Rolán, 1997: 18, fig. 18; Cachia *et al*., 2001: 114, pl. 18 fig. 12.

Material: 03.08.2000, sta. 6, 20 m, muddy sand, 1 sp. + 1 sh.; 09.08.2000, sta. 12, 34 m, mud, 1 sp.; 13.08.2000, sta. 16, 30 m, muddy sand, 2 sp.; 07.03. 2003, sta. 24, 46-74 m, mud, 1 sh.; 29.07.2009, sta. 25, 67 m, mud, 1 sh.; 29.07.2009, sta. 26, 49 m, mud, 1 sp.; 22.12.2001, sta. 29, 22-39 m, mud, 1 sp.; 13.02.2002, sta. 29, 22-39 m, mud, 1 sp. + 1 sh.; 30.07. 2009, sta. 30, 25 m, sandy mud, 1 sp. + 1 sh.; 14.06.2001-03.06.2002, sta. 31, 8-21 m, *P. oceanica* + sandy mud, 4 sp. + 2 sh.; 16.03.2006, sta. 35, 52 m, sandy mud, 1 sp.; 30.09.2000, sta. 39, 32 m, mud, 2 sp.; 08.10.2005, sta. 40, 5 m, muddy sand with *C. racemosa*, 1 sp.; 18.09.2000, sta. 50, 47 m, *Caulerpa* sp. + mud, 1 sh., 22.09.2000, sta. 57, 44 m, sand + algae, 1 sp.; 01.06.1997, sta. 59, 33 m, mud, 1 sp.; 03.10.2005, sta. 62, 9 m, *P. oceanica*, 1 sh.; 30.07.2011, sta. 83, 7 m, sand, 1 sp. + 1 sh.

The shell of the species is conical with flat or slightly convex teleoconch whorls. The axial ribs are opisthocline, a bit shouldered at the adapical sutures, and are thicker than the interspaces. The protoconch is helicoid. The last whorl consists about 0.30-0.40 of the total shell height. There is a remarkable variability in the general shell shape of the specimens within *T. pseudogradata*, although all of them seem to belong to only one species. *Mean dimensions* (19 specimens + 10 shells): 4.10 (±0.28) x 1.25 (±0.04)–1.60 (±0.08) mm [6.3 x 1.6 – 2.1 mm].

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 1997: 18). *Turkish coasts*: Levantine Sea, Aegean Sea and Sea of Marmara (the present study).

***Turbonilla pumila* Seguenza, G., 1876** (Figure 22)

Turbonilla pumila; Peñas *et al*., 1996: 70, figs 165-168, 171; Peñas and Rolán, 1997: 28, figs 44-46; Cachia *et al*., 2001: 114, pl. 18 fig. 13.

Turbonilla innovata; van Aartsen, 1981: 72, pl. 5 fig. 26.

Turbonilla pallaryi; van Aartsen, 1981:71, 81, pl. 5 fig. 27.

Turbonilla pseudostricta; Nordsieck, 1972:125, pl. P5 fig. 22.

Material: 22.09.2000, sta. 57, 44 m, sand + algae, 5 sp.; 26.09.2005, sta. 68, 5 m, sand, 1 sh.

The shell of the species varies from conical to slightly pupoid, depending on the specimens. The teleoconch whorls are moderately convex and bear slightly curved, opisthocline axial ribs. They are often thicker than the interspaces. The protoconch is planorbid. The last whorl occupies about 0.40 of the total shell height. *Mean dimensions* (5 specimens + 1 shell): 2.90 (±0.28) x 0.98 (±0.07)–1.18 (±0.08) mm [3.8 x 1.2 – 1.5 mm].

The shell shape of the species has some similarities with *Turbonilla pusilla* and *Turbonilla lactea*. It differs from *T. pusilla* by its planorbid protoconch, and from *T. lactea* by the axial ribs on the body whorl and their interspaces, ending gradually at the periphery (instead of suddenly in *T. lactea*).

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 1997: 30). *Turkish coasts*: Levantine Sea (Buzzurro and Greppi, 1996: 8) and Aegean Sea (this study).

***Turbonilla pusilla* (Philippi, 1844)** (Figure 23)

Chemnitzia pusilla Philippi, 1844.

Turbonilla pusilla; van Aartsen, 1981: 71, pl. 4 Figure 25; van Aartsen *et al*., 1984: 54; Peñas *et al*., 1996: 70, figs 183-184, 188, 193; Peñas and Rolán, 1997: 20.

Material: 03.08.2000, sta. 6, 20 m, mud+sand, 2 sh.; 03.08.2000, sta. 7, 47 m, mud, 1 sh.; 13.08.2000, sta. 11, 29 m, sand, 1 sh.; 31.03.2010, sta. 29, 11 m, mud, 1 sp.; 08.05.2002, sta. 31, 8 m, *P. oceanica*, 2 sh.; 16.09.2000, sta. 44, 14 m, *P. oceanica*, 2 sh.; 07.10.2005, sta. 59, 3 m, *Zostera* sp., 1 sp.; 03.02.2009, sta. 71, 20, muddy sand, 2 sh.; 04.02.2009, sta. 72, 13 m, mud, 1 sp.; 04.02.2009, sta. 75, 9 m, mud, 2 sp.; 04.02.2009, sta. 76, 21 m, muddy sand, 1 sh.; 09.09.2005, sta. 81, 50 m, muddy sand with shell fragments, 2 sp.; 09.09.2005, sta. 85, 50 m, muddy sand, 2 sh.

The shell shape of the species varies from regularly conical to nearly cylindrical, and includes flat or slightly convex teleoconch whorls. The axial ribs are opisthocline and slightly curved or flexuous, they are almost thicker than the interspaces. The protoconch is helicoid, and the last whorl is about 0.30-0.40 of the total shell height. *Mean dimensions* (7 specimens + 12 shells): 3.04 (±0.16) x 0.99 (±0.03)–1.22 (±0.04) mm [4.2 x 1.3 – 1.6 mm].

Turbonilla pusilla includes rather variable specimens, and some of them have an important similarity with those of *T. pumila*, from which they can be distinguished by their helicoid protoconch.

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 1997: 22). *Turkish coasts*: Levantine Sea (Buzzurro and Greppi, 1996: 8; Micali and Palazzi, 1992: 86), Aegean Sea (Micali and Palazzi, 1992: 86), Sea of Marmara (Sturany, 1895: 121; Wilke and van Aartsen, 1998: 16, 21) and Black Sea (Wilke and van Aartsen, 1998: 16, 21).

***Turbonilla rufa* (Philippi, 1836)** (Figure 24)

Melania rufa Philippi, 1836.

Turbonilla rufa; van Aartsen, 1981: 67, 75, 80, pl. 2 fig. 10; Peñas *et al*., 1996: 72, figs 161-162; Peñas and Rolán, 1997: 68, figs 194-198; Cachia *et al*., 2001: 115, pl. 19 fig. 2.

Material: 03.08.2000, sta. 4, 22-32 m, muddy sand, 8 sh; 03.08.2000, sta. 6, 20 m, sandy mud, 11 sh.; 09.08. 2008, sta. 12, 17 m, muddy sand, 1 sp.; 13.08.2000, sta. 15, 27 m, *P. oceanica*, 1 sh.; 29.07.2000, sta. 18, 70 m, sandy mud, 1 sp.; 07.03.2003, sta. 24, 46-74 m, sand+coralligenous + *P. oceanica*, 2 sh.; 19.09.2003, sta. 28, 9 m, mud, 1 sp. +

1 sh.; 11.11.2009, sta. 30, 26 m, sandy mud, 1 sh.; 14.06.2001, sta. 31, 21 m, sandy mud, 2 sh.; 03.06.2005-26.03.2009, sta. 34, 25-62 m, mud, sand and their mixture, 7 sp. + 12 sh.; 22.02.2001-25.06.2009, sta. 35, 6-55 m, sand, mud and their mixture, 5 sp. + 19 sh.; 14.09.2000, sta. 36, 54 m, muddy sand, 4 sp. + 15 sh.; 30.09.2000, sta. 38, 41 m, sandy mud, 2 sh.; 29.09.2000, sta. 42, 7 m, sand + *Zostera* sp., 4 sh.; 17.09.2000, sta. 46, 44 m, sandy mud, 10 sh.; 17.09.2000, sta. 47, 37 m, *Caulerpa* sp. + sandy mud, 2 sp. + 1 sh.; 06.02.2002, sta. 49, 20 m, *P. oceanica*, 1 sp.; 21.09.2000, sta. 55, 57 m, sand, 1 sp.; 22.09.2000, sta. 57, 44 m, sandy mud, 3 sp. + 6 sh.; 23.09.2000, sta. 66, 10 m, muddy sand, 1 sh.; 18.09.2005, sta. 70, 5 m, sand, 1 sp.; 04.02.2009, sta. 72, 13 m, mud, 4 sh.; 10.09.2005, sta. 77, 10 m, muddy sand, 2 sp.; 11.06.2002- 15.09.2005, sta. 80, 1-16 m, sand + mud and their mixture, 9 sh.; 09.09.2005, sta. 81, 50 m, sandy mud, 2 sp. + 4 sh.; 31.07.2009-17.10.2009, sta. 82, 7-12 m, muddy sand, 10 sh.; 09.09.2005-30.07.2010, sta. 83, sand, mud and their mixture, 1-10 m, 100 sp. + 20 sh.; 14.09.2005, sta. 84, 0.5-1.0 m, sand, 1 sh.

The species has an elongated, conical shell with flat to slightly convex teleoconch whorls. The axial ribs are generally orthocline, but in some specimens, especially on the body whorl, may be prosocline at the lower end. There are also regularly spaced incised spirals (~ 6 rows) between the axial ribs. The protoconch is planorbid. *Mean dimensions* (131 sp. + 144 sh.): 4.31(±0.12) x 1.40 (±0.02)–1.04 (±0.02) mm [9.8 x 2.5 – 2.0 mm].

The nomenclatural status of the species was commented upon by van Aartsen, 1981: 75.

Distribution: Eastern Atlantic and Mediterranean Sea (Peñas and Rolán, 1997:68; Cachia *et al*., 2001: 115). *Turkish coasts*: Levantine Sea (Buzzurro and Greppi, 1996: 8; Micali and Palazzi, 1992:86); Aegean Sea (Micali and Palazzi, 1992:86; Demir, 2003: 115) and Sea of Marmara (Ostroumoff, 1896: 63,70; Oberling, 1969-1971: 190). It is the most abundant *Turbonilla* species along the Turkish coasts.

***Turbonilla striatula* (Linnaeus, 1758)** (Figure 25)

Turbo striatulus Linnaeus, 1758.

Turbonilla striatula; van Aartsen, 1981: 66, pl. 1 fig. 4; van Aartsen *et al*., 1984: 54; Peñas *et al*., 1996: 73, figs 155, 158; Cachia *et al*., 2001: 115, pl. 19 fig. 2.

Material: 09.06.2003, sta. 35, 18 m, *P. oceanica* + sand, 2 sp.+1 sh.; 17.09.2000, sta. 47, 37 m, *Caulerpa* sp. + sandy mud, 1 sh.; 21.09.2000, sta. 54, 26 m, sand + algae + *P. oceanica*, 1 sh.; 22.09.2000, sta. 57, 44 m, sand + algae, 4 sp.; 05.10.2005, sta. 60, 6 m, *P. oceanica*, 1 sp.; 26.09.2005, sta. 68, 5 m, sand, 1 sp.; 04.08.2009, sta. 72, 14 m, mud, 4 sp. + 2 sh.; 04.02.2009, sta. 75, 9 m, mud, 1 sp. + 3 sh.; 05.08.2009, sta. 76, 21 m, muddy sand, 1 sh.; 09.09.2005, sta. 85, 50 m, sandy mud, 1 sp.

The shell is regularly or broadly conical with convex teleoconch whorls, generally bearing brownish bands. The protoconch is helicoid. The axial ribs are orthocline, straight or slightly curved at the upper part. Varices are generally present on the whorls. Incised spirals between the axial ribs are also present, although they are not well pronounced. *Mean dimensions* (14 specimens + 9 shells): 4.11(± 0.37) x 1.44 (±0.08)–1.77 (±0.11) mm [6.6 x 2.1 – 2.6 mm].

The species has some similarities with *Turbonilla rufa*, but differs from it by its helicoid protoconch; having varices on the whorls, and with the spirals being less evident and more numerous.

Distribution: Mediterranean Sea (Peñas *et al*., 1996: 73; Cachia *et al*., 2001: 116). *Turkish coasts*: Levantine Sea (Buzzurro and Greppi, 1996: 8; Micali and Palazzi, 1992: 86), Aegean Sea (Micali and Palazzi, 1992: 86; Demir, 2003: 115).

Discussion

In the material recorded from the Sea of Marmara and along the Turkish coasts of the Levantine and Aegean Seas, 4 *Anisocycla*, 5 *Eulimella*, 1 *Puposyrnola*, 2 *Syrnola* and 12 *Turbonilla* species were identified. Out of 4 *Anisocycla* species found herein, all were recorded from the Aegean Sea, of which *Anisocycla gradata*, *A. nitidissima* and *A. striatula* have been new records from the Turkish Aegean coast. Except for *A. striatula*, the other three species were previously reported by different authors from the Turkish Levantine coast, and *A. pointeli* and *A. nitidissima* are also known from the Sea of Marmara. In the eastern Mediterranean, *A. striatula* (reported as *A. folini*), *A. nitidissima* and *A. pointeli* were also recorded from the Cypriot coast (Öztürk *et al*., 2003) and *A. nitidissima* from the Cretan Sea (Koutsoubas *et al*., 2000).

In the Atlanto-Mediterranean region the genus *Eulimella* was represented with 20 species (CLEMAM), of which *Eulimella acicula*, *E. neoattenuata*, *E. scillae*, *E. ventricosa* and *E. unifasciata* were also found along the Turkish coasts. Of the above cited species, *E. scillae*, *E. unifasciata* and *E. neoattenuata* were encountered in the Aegean Sea only. *Eulimella acicula*, found in all the studied seas, attracts attention as the species with the widest distribution. It has also been reported several times from the Black Sea (from its northern and western parts), although along the Turkish coast it is known from one locality only Wilke and van Aartsen (1998, Figure 6). The other widely distributed eulimellid is *E. scillae* and in some works carried out before (Koutsoubas *et al*., 2000), this species was noted to be distributed in all the Mediterranean system (including Sea of Marmara and Black Sea). The existence of the species in the Black Sea seems doubtful, as it was also noticed by Wilke and van Aartsen (1998). The figure given for the species by Chuchcin (1984), who recorded it from the region, is with any resemblance to the actual one.

Eulimella unifasciata and *E. neoattenuata*, which are rather similar in shell form, are species with circumlittoral and bathyal distribution, both of them found at two stations. *Eulimella unifasciata* was recorded at depths of 113 and 120 m, and *E. neoattenuata* was sampled at depths of 31 m and 86 m, which are depths lesser than those known (305-1340 m; Peñas and Rolán, 1999) for the distribution of *E. neoattenuata*. However, the three shells (without soft parts in) found in the present study had been probably moved to the side by water movements. According to the relevant literatures, this record is a new one for the eastern Mediterranean fauna. Along the Levantine coast we found only *Eulimella acicula* and *E. ventricosa*. They were previously reported from the area by Micali and Palazzi (1992) and Bitlis Bakir *et al*. (2012).

Puposyrnola minuta is the only representative of the genus in the Mediterranean. In the studies carried out before, the species was reported from the western Mediterranean, Italian coast and Maltese Islands (Peñas and Rolán, 1997:96; Oliverio, 2008:276 and Cachia *et al*., 2001: 94). In the present study it was recorded two shells in Saros Bay at 47 m depth.

The genus *Syrnola* is represented in the Mediterranean by: *S. cinctella*, *S. fasciata* and *S. lendix*. They are all alien species, which entered in the Mediterranean during the last half-century. Of the two species found in the present study, *S. fasciata* was recorded for the first time from the Israeli coast in 1958 (van Aartsen *et al*., 1989) and since then it has expanded its distributional area up to the Aegean Sea (Öztürk and Can, 2006). The first Mediterranean record of *Syrnola lendix* from a locality near Kaş (Southern Turkey) is based on the work by Micali and Palazzi (1992), however this record was found doubtful by Nofroni and Tringali (1995: 41), and the last authors noted that the single shell found by Micali and Palazzi (1992) could be belong to *S. fasciata*. On the other hand, *S. cinctella*, which was not recorded in the present study, is known from a single record in Yumurtalık (Iskenderun Bay, Turkish Levantine coast) (van Aartsen and Recevik, 1998).

The genus *Turbonilla* is one of the largest pyramidellid genera, represented with 52 species in the Atlanto-Mediterranean region (CLEMAM). The species within this genus are difficult to determine, because, even if there are many diagnostic characters allowing a fast determination of some species, but some other ones show a wide variability, even within a single population.

Out of 12 *Turbonilla* species identified in this study, 9 species (*T. acuta, T. acutissima, T. hamata, T. jeffreysi, T. lactea, T. pumila, T. pusilla, T. rufa* and *T. striatula*) had been reported already in studies carried out previously in different localities along the Turkish coasts (Buzzurro and Greppi, 1996; Demir, 2003; Wilke and van Aartsen, 1998 etc.). However, *Turbonilla micans*, *T. paucistriata* and *T. pseudogradata* are new records for the Turkish mollusc fauna. *Turbonilla pseudogradata*, sampled from the Levantine Sea, Aegean Sea and Sea of Marmara, is a littoral species found at depths between 5-74 m, whereas the other two taxa are distributed at deeper bottoms. A single shell of *T. micans* was found in a material sampled from the Aegean Sea at a depth of 875 m. Due probably to the existence of more numerous studies performed at larger depths in the western and central Mediterranean, the species has been reported several times from the mentioned regions (Peñas *et al*., 1996; Cachia *et al*., 2001; Oliverio, 2008), although in the eastern Mediteranean the single report is based on the work by Galil (2004). The present record of the species is the first one from the studied area. *Turbonilla paucistriata* has been recorded both from the Levantine and Aegean seas at depths between 183 and 1305 m. Of the studies carried out earlier (Peñas *et al*., 1996; Cachia *et al*., 2001; Oliverio, 2008), the species is known to be distributed in the western and central Mediterranean. The reports in the present study are new ones for the areas where they have been found. In addition to the species mentioned above, *T. acutissima* is a new report for the Turkish Aegean coast and Sea of Marmara and *T. pumila* is being a new one for the Turkish Aegean coast.

Fretter *et al*. (1986) and Troncoso and Urgorri (1990) considered *Turbonilla delicata* (Monterosato, 1874) a synonym of *Turbonilla acuta* (Donovan, 1804), due to this fact, the records of *T. delicata* from different localities along the Turkish coasts in earlier studies (Ostroumoff, 1896; Oberling, 1969-1971; Micali and Palazzi, 1992; Buzzurro and Greppi, 1996; Wilke and van Aartsen, 1998; Bitlis Bakır *et al*., 2012) were herein considered under *T. acuta*.

In the present study we use Nordsieck's taxon *Turbonilla hamata* for specimens with a helicoid protoconch instead of *T. gradata* B.D.D., 1883 (Micali, pers. com.).

In the Mediterranean there are two very similar species with different protoconchs, and it is proposed to use *T. gradata* B.D.D., 1883 for the specimens with planorbid protoconch (Micali, pers. com.)

Out of 12 *Turbonilla* species identified in this study, *T. acuta* (=*T. delicata*) and *T. pusilla* are species with the widest distribution along the Turkish coasts, found in all the studied seas; 10 species are distributed in the Levantine Sea, 11 species in the Aegean Sea, 7 species in the Sea of Marmara, and two species are distributed in the Black Sea.

Acknowledgements

The authors are much indebted to Pasquale Micali and Italo Nofroni (Italy) for their help in the identification of some specimens and for the provided

Figure 1. Map of the studied area with the location of the sampling sites.

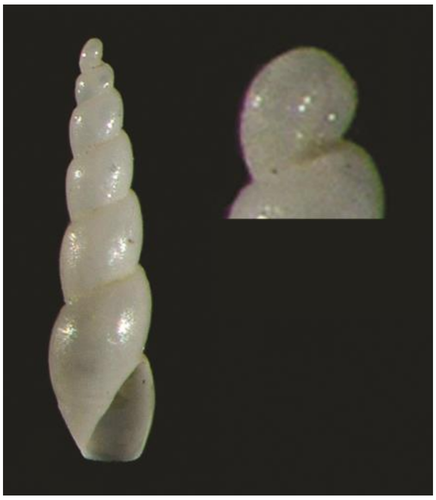

Figure 2. *Anisocycla gradata*: frontal view of the found specimen and its protoconch. (h=1.9 mm).

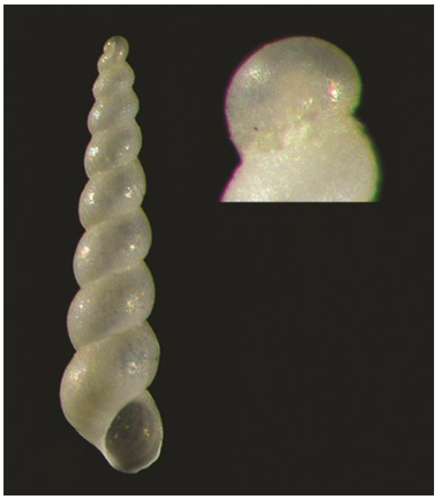

Figure 3. *Anisocycla nitidissima*: frontal view of a specimen and its protoconch. (h=2.4 mm, sta. 22, 30 m).

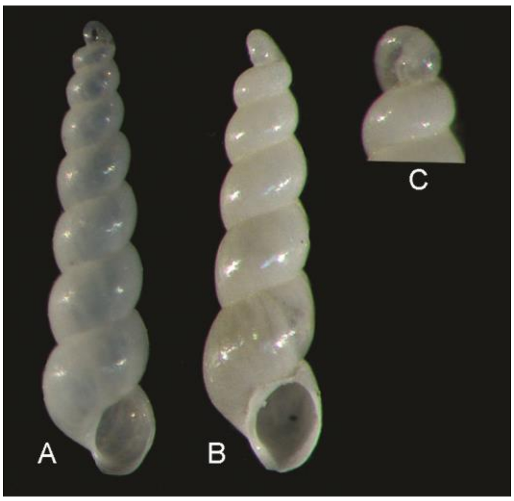

Figure 4. *Anisocycla pointeli*: frontal view of two specimens and the protoconch (C) of the specimen (B). (A=2.3 mm, sta. 49, 31 m; B=1.5 mm, sta. 35, 61 m).

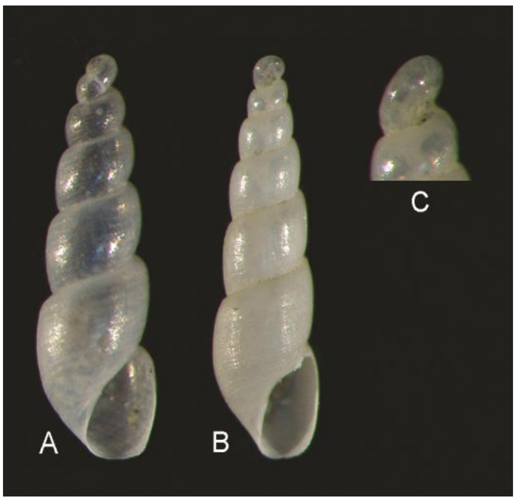

Figure 5. *Anisocycla striatula*: frontal view of two specimens and the protoconch (C) of the specimen (B). (A=1.6 mm, sta. 30, 26 m; B=1.9 mm; sta. 35, 25 m).

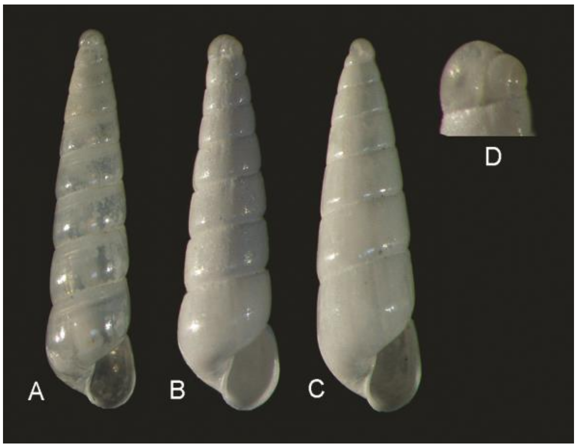

Figure 6. *Eulimella acicula*: frontal view of three specimens and the protoconch (D) of the specimen (B). (A=3.4 mm, B=2.9 mm, C=2.6 mm, sta. 36, 54 m).

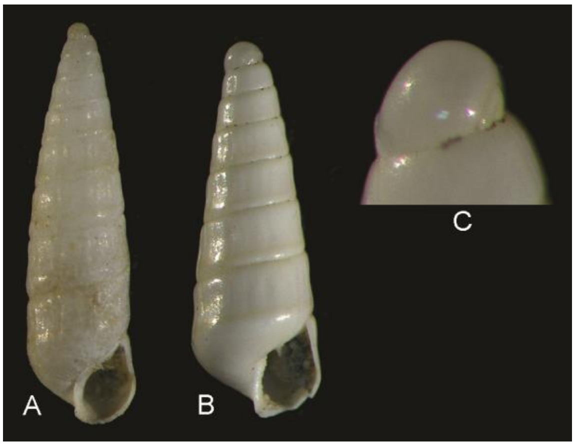

Figure 7. *Eulimella neoattenuata*: frontal view of two shells and the protoconch (C) of the shell B. (A= 4.5 mm; sta. 49, 31 m; B=3.1 mm, sta. 52, 86 m).

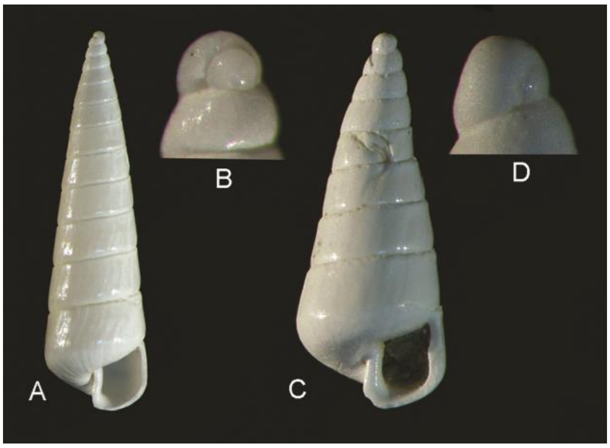

Figure 8. *Eulimella scillae*: frontal view of two specimens and the protoconch (B) of the specimen A and the protoconch (D) of the specimen C. (A=7.0 mm, sta. 34, 62 m; C=3.4 mm, sta. 2, 93 m).

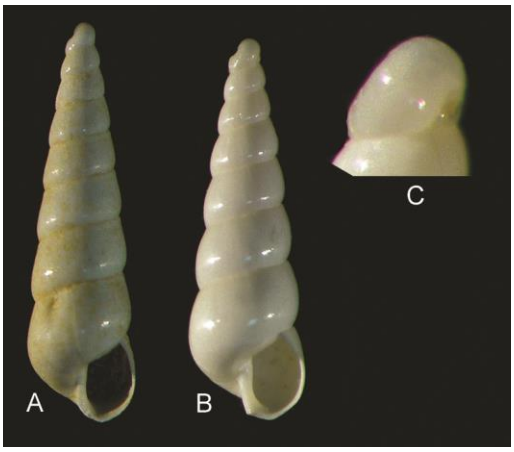

Figure 9. *Eulimella ventricosa*: frontal view of two shells and the protoconch (C) of the shell (B). (A=3.1 mm, sta. 19, 70-90 m; B= 2.1 mm, sta. 10, 20 m).

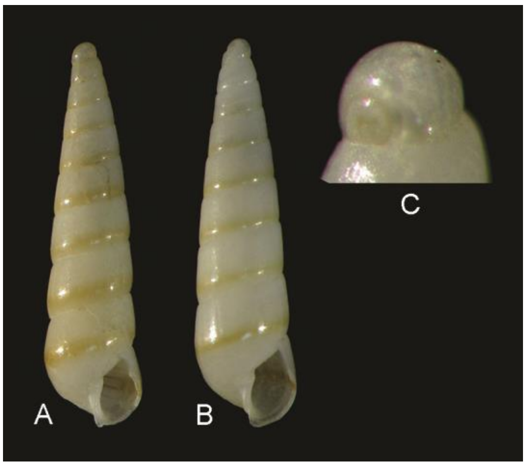

Figure 10. *Eulimella unifasciata*: frontal view of two specimens and the protoconch (C) of the specimen B. (A=5.6 mm; B= 5.0 mm, sta. 37, 113 m).

Figure 11. *Puposyrnola minuta*: frontal view of a shell and its protoconch (h=3.1 mm).

Figure 12. *Syrnola fasciata*: frontal view of two specimens and the protoconch (C) of the specimen (B). (A=6.3 mm, sta. 83, 4 m; B= 4.3 mm, sta. 82, 7 m).

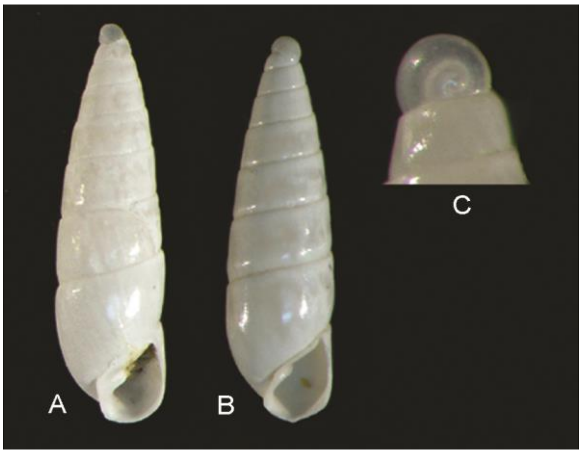

Figure 13. *Syrnola lendix*: frontal view of two specimens and the protoconch (C) of the specimen (B). (A=3.2 mm, sta. 76, 21 m; B=2.9 mm, sta. 72, 14 m).

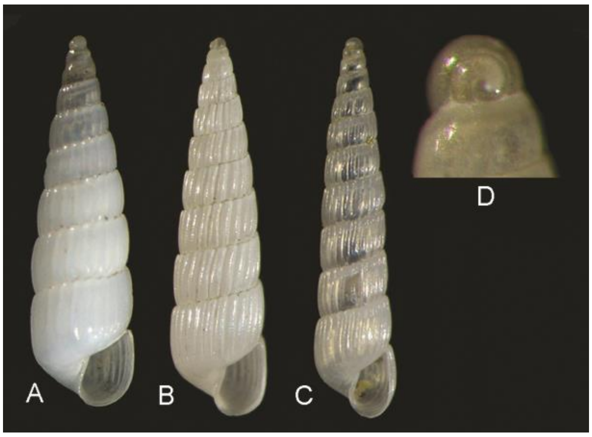

Figure 14. *Turbonilla acuta*: frontal view of three specimens and the protoconch (D) of the specimen (A). (A=4.1 mm, B=4.6 mm, sta. 83, 3-9 m; C=5.4 mm; sta. 82, 3-10 m).

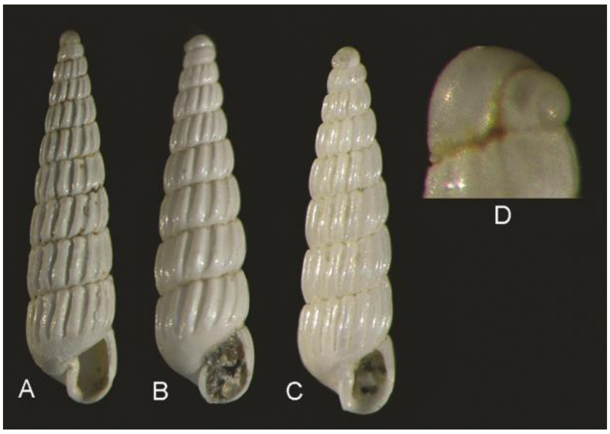

Figure15. *Turbonilla acutissima*: frontal view of three specimens and the protoconch (D) of the specimen (A). (A=4.2 mm; sta. 35, 46 m; B=3.2 mm; sta. 26, 49 m; C=2.9 mm; sta. 46, 44 m).

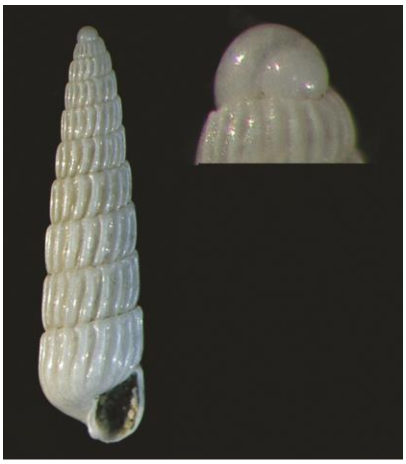

Figure 16. *Turbonilla hamata*: frontal view of the found specimen and its protoconch. (h= 3.8 mm).

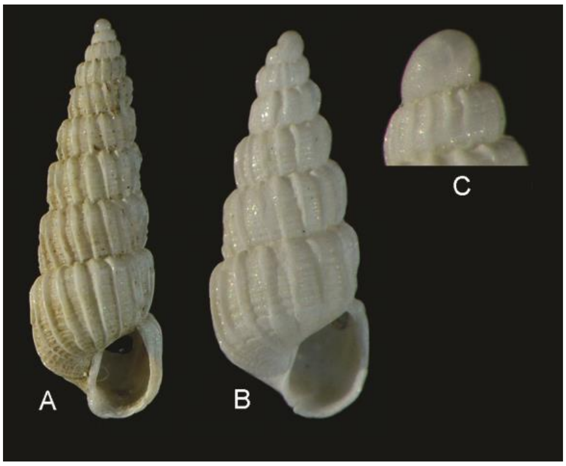

Figure 17. *Turbonilla jeffreysii*: frontal view of two specimens and the protoconch (C) of the shell (B). (A=6.5 mm, B=3.4 mm, sta. 1, 8 m).

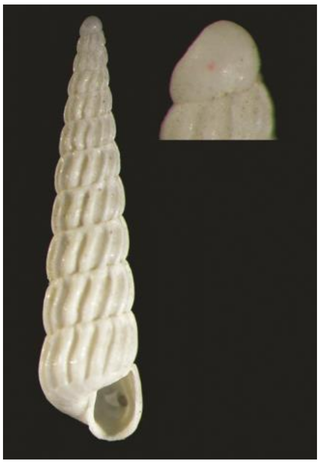

Figure 18. *Turbonilla lactea*: frontal view of a specimen and its protoconch. (h=5.5 mm, sta. 18, 70 m).

Figure 19. *Turbonilla micans*: frontal view of the found shell and its protoconch. (h= 1.7 mm).

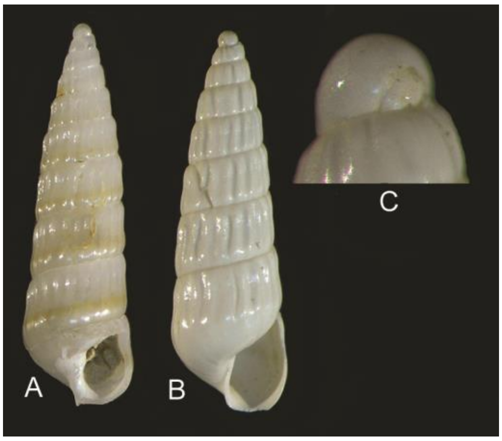

Figure 20. *Turbonilla paucistriata*: frontal view of two shells and the protoconch (C) of the shell (B). (A=6.7 mm; sta. 63, 1302 m; B=5.3 mm).

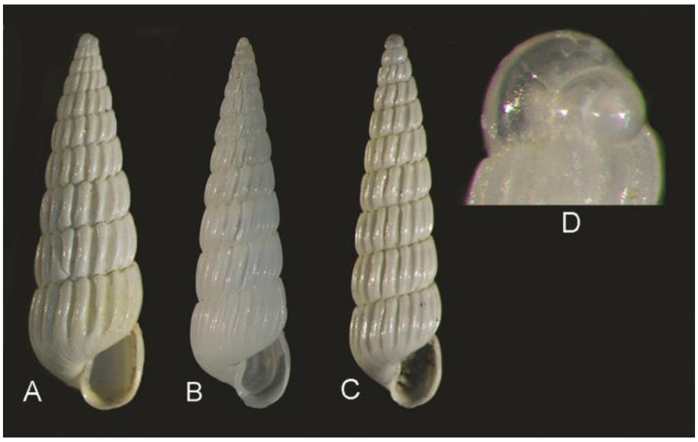

Figure 21. *Turbonilla pseudogradata*: frontal view of three specimens and the protoconch (D) of the specimen (B). (A=5.5 mm, B=6.9 mm, sta. 57, 44 m; C=4.3 mm, sta. 16, 30 m).

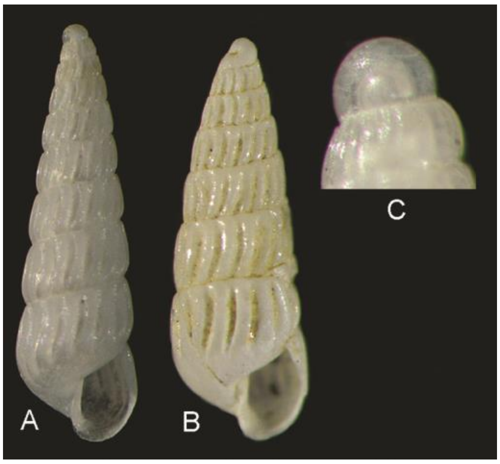

Figure 22. *Turbonilla pumila*: frontal view of two specimens and the protoconch (C) of the specimen (A). (A=3.8 mm, sta. 57, 44 m; B= 2.5 mm, sta. 68, 5 m).

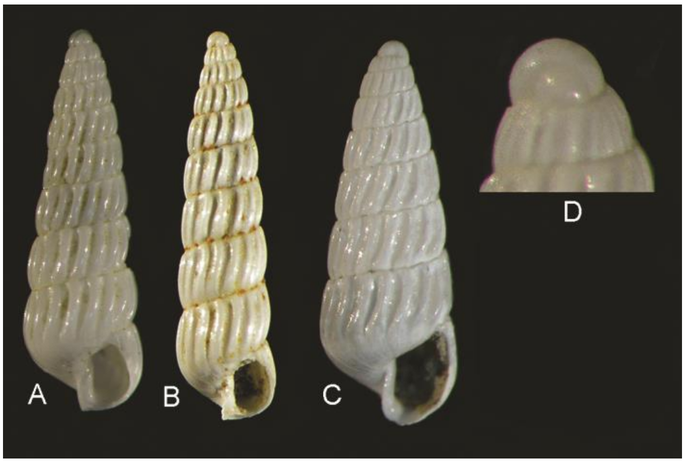

Figure 23. *Turbonilla pusilla*: frontal view of three specimens and protoconch (D) of the specimen A. (A=3.4 mm, B=3.7 mm, sta. 6, 20 m; C=3.1 mm, sta. 85, 50 m).

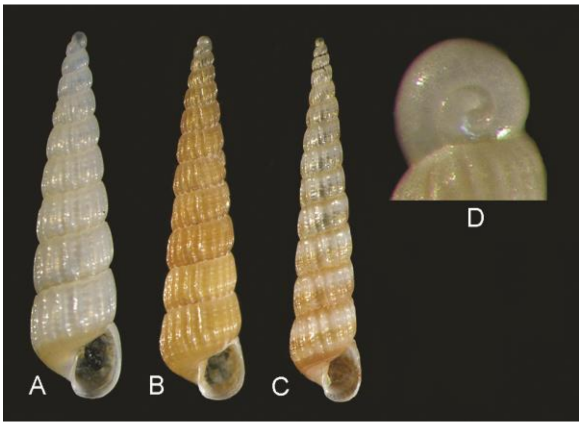

Figure 24. *Turbonilla rufa*: frontal view of three specimens and the protoconch (D) of the specimen (B). (A=4.3 mm, sta. 35, 55 m; B=6.2 mm, C=7.3 mm, sta. 83, 1-10 m).

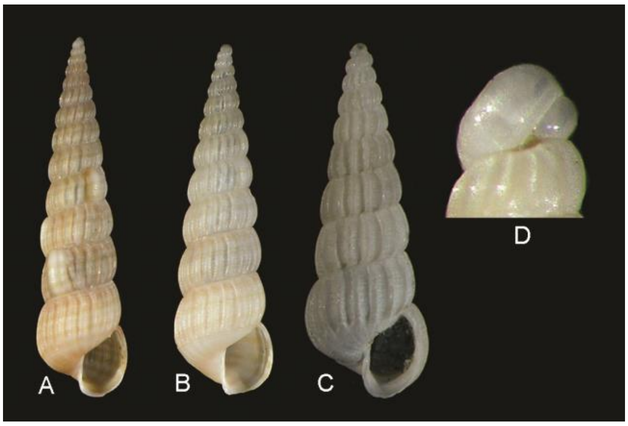

Figure 25. *Turbonilla striatula*: frontal view of three specimens and the protoconch (D) of the specimen (B). (A=9.2 mm, B=8.6 mm, sta. 35, 18 m; C=5.1 mm, 85, 50 m).

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