

## On a collection of Turridae (Gastropoda: Prosobranchia) from Turkish waters

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## Introduction

Turridae is the largest group of marine gastropods, with hundreds of species occurring in all seas (DANCE, 1992). According to SABELLI *et al.* (1990), the family includes 108 species in the Mediterranean Sea. Turrid gastropods from European seas and Mediterranean have been studied by many conchologists (eg., NORDSIECK, 1977; VAN AARTSEN *et al.*, 1984; POPPE & GOTO, 1991; and CACHI *et al.*, 2001). Although the history of the scientific works on Turkish malacofauna dates back to the beginning of 20th century, first records on turrids from Levanten Seas appeared in the monumental work of OBERLING (1969-1971). In his study on the littoral mollusca of the Sea of Marmara, the author reported six turrid gastropods from Marmaric waters. Since the work of OBERLING, other malacologists spend some effort for identifying the turrids from Turkish Seas to some extent (BUZZURRO & GREPPI, 1996; DEMIR, 2003; KABASAKAL & KABASAKAL, 2005; OZTURK 2001; OZTURK & CEVIK, 2000; OZTURK *et al.*, 2003). According to most recent malacological lists of Turkish waters, a total of 46 species of turridae recorded in the area. This number represents about 43 percent of Mediterranean turrids in total.

Since 2000, authors have been carrying out expeditions to different locations along Turkish coast, for collecting sea shells. With the exception of *Crassopleura incrassata* (DUJARDIN, 1837), which was collected in northern Sea of Marmara at a depth of 48 m, and *Raphitoma (Raphitoma) laviae* (PHILIPPI, 1844), which was collected in Saros Bay (NE Aegean Sea) at a depth of 21 m, the remaining turrids were sampled in shallow coastal waters, at a depth of  $\leq 5$  m. Most of the turrids were collected by means of skin diving, however, the only specimen of *C. incrassata* was sampled by means of dredging over muddy-sandy bottom, and *R. (R.) laviae* collected by means of scuba diving. These expeditions yielded a total of 16 turrid gastropods from Turkish waters. In the present paper, species list of the identified turrids with short descriptions, as well as a pictorial guide, are given. Identification of the turrids follows NORDSIECK, 1977; VAN AARTSEN *et al.*, 1984; POPPE & GOTO, 1991; ARDUINO *et al.*, 1995 and CACHI *et al.*, 2001; and taxonomical nomenclature follows SABELLI *et al.* (1990).

## Species List

## TURRIDAE SWAINSON, 1840

1. *Bela brachystoma* (PHILIPPI, 1844)

One empty shell was collected over sandy bottom at a depth of 1 m in waters of Bozcada (NE Aegean Sea). It is a rather cylindrical to fusoid shell, of a dark brown monochrome colour. Whorls only slightly convex and shouldered at their crest. Eight to 9 axial ribs, equal to interspaces in thickness. Shell totally covered with a spiral sculpture of usually alternating strong and fine spaced granular striae. Six to 8 strong spirals on the penultimate whorl. Sinus slight and canal short.



**2. *Bela* cf. *nebula* (MONTAGU, 1803)**

One empty shell was collected over sandy bottom at a depth of 1 m in waters of Bozcada (NE Aegean Sea). It is a slim, elongated cone, of a light yellow base colour with light brown interspaces and base. Seven to 9 ribs on the body whorl. Numerous somewhat alternating strong and fine spirals, about 20-25 on the penultimate whorl. Aperture oblong, sometimes with a short siphonal canal and a wide shallow posterior sinus.



**3. *Mangelia paciniana* (CALCARA, 1839)**

Two empty shells was collected over sandy bottom at a depth of 20-30 cm in waters of Bozcada (NE Aegean Sea). Shell solid, glossy, creamy white, with a brown sub-sutural band and other fine brown spirals on the whorls. Lip thickened, sometimes with a large denticle below the sinus. Whorls are evenly convex, slightly shouldered especially earlier ones. There are 8 to 11 rather orthocone ribs on the body whorl. Posterior sinus deep, siphonal canal well notched.



**4. *Mangelia smithii* (FORBES, 1840)**

One empty shell was collected over sandy bottom at a depth of 20-30 cm in waters of Bozcada (NE Aegean Sea). It is a spindle-shaped, thin-shelled turrid. Protoconch 2½ small white whorls. Eight to 9 slightly oblique ribs on the body whorl, a little more than half the interspaces in thickness. Aperture oblong with shallow wide sinus, and the outer lip is thickened. Colour whitish with a thin dark brown spiral band.



**5. *Mangelia stossiciana* BRUSINA, 1869**

One empty shell was collected over sandy bottom at a depth of 1 m in waters of Bozcada (NE Aegean Sea). Shell is thick, glossy and yellowish-white in colour. Convex whorls, shouldered at their adapical tip. About 8 thick ribs on body whorl and a very strong varix on outer lip. Spiral sculpture of strong chords, forming knobs on the ribs.



**6. *Mangelia unifasciata* (Deshayes, 1835)**

One empty shell was collected over sandy bottom at a depth of 20-30 cm in waters of Bozcada (NE Aegean Sea). Shell is solid, elongated with 2½ small protoconch whorls, and whitish to yellow in colour, often with spiral bands. Sculpture of slightly opisthocline ribs, 9 on the body whorl. Spiral sculpture of 3-4 strong striae on penultimate whorl, alternating with finer ones.



**7. *Mangelia vauquelini* (Payraudeau, 1826)**

One empty shell was collected under a stone at a depth of 1 m in Güvercinlik Bay, Bodrum (SE Aegean Sea); 2 empty shells found in a death colony of sponge, *Verongia aerohoba* at a depth of ca. 2 m in Saros Bay (NE Aegean Sea); 4 empty shells were collected over sandy bottom at a depth of 20-30 cm in waters of Bozcada (NE Aegean Sea). Biconic, rather strong-shelled turrid, not too slim in aspect. Shell is yellowish-white with a brown sub-sutural line. Whorls convex, sub-angulated at their adapical tip. About 10 ribs on the body whorl, equal to interspaces in thickness. Aperture about half height, with a strong labial varix, inside white.



**8. *Mangiliella taeniata* (Deshayes, 1835)**

One empty shell was collected under a stone at a depth of 1 m in Güvercinlik Bay, Bodrum (SE Aegean Sea). Shell is fusoid, double cone-shaped. Sloping but acute shoulder, solid and glossy. Protoconch of 1½ darkish, dissolute whorls. Five teleconch whorls with about 10 high, connected ribs, thickened at the shoulder-angle. Tail little marked, smooth. Lip with varix and conspicuous tooth at the above inner lip.



**9. *Crassopleura incrassata* (Dujardin, 1837)**

One empty shell was collected over muddy-sandy bottom at a depth of 48 m off Tuzla coast (NE Sea of Marmara). Shell is fusoid, solid, reddish-brown to dun. There are 3 smooth, light protoconch whorls. No spiral sculpture. Twenty to 25 dense, arcuated ribs, which are equal to interspaces in thickness. Aperture with a very deep sinus at the suture and a parietal notch at the opposite.



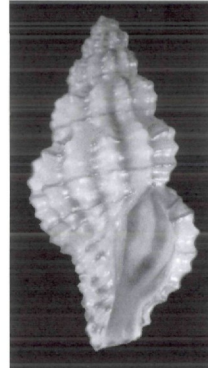
**10. *Raphitoma (Raphitoma) laviae* (PHILIPPI, 1844)**

One empty shell was collected over sandy bottom, with remains of death algae at a depth of 21 m in Saros Bay near Ibrice harbour (NE Aegean Sea). Shell solid, slender-fusoid, elongated in aspect; uniformly yellowish-brown. Protoconch with 3 small, rounded, polygyrate whorls. Six to 7 teleconch whorls with regularly reticulated. Eighteen to 20 (sometimes 24) axial ribs, crossed by spiral chords, forming rather pointed knobs at their intersections. Canal short, outer lip thickened and dentated within.



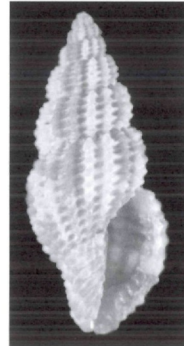
**11. *Raphitoma (Raphitoma) linearis* (MONTAGU, 1803)**

One empty shell found in a death colony of sponge, *Verongia aerohoba* at a depth of ca. 2 m in Saros Bay (NE Aegean Sea); 2 empty shells was collected over sandy bottom at a depth of 20-30 cm in waters of Bozcada (NE Aegean Sea). Shell is real fusoid, acute, solid, clean white-hyalin with beautiful red lines over the spirals. Protoconch with 3 whorls; teleconch with 8-9 very convex whorls. There are ten to 12 strong and sharp ribs on the penultimate whorl, with strong and sharp spirals, causing pointed nodes at intersections. Canal short; sinus immediately at the suture; inner lip with rounded teeth.



**12. *Raphitoma (Raphitoma) purpurea* (MONTAGU, 1803)**

Two empty shells was collected over sandy bottom at a depth of 20-30 cm in waters of Bozcada (NE Aegean Sea). Spindle-shaped shell with a tall spire. Purplish brown to warm brown with scattered whitish vertical and horizontal tubercle series. Whorls convex. Sculpture consists of 20-24 axial ribs thicker than interspaces crossed by 6-9 spiral chords on the penultimate whorl, causing rather transverse smooth knobs at the crossing points.



**13. *Raphitoma (Leufroyia) concinna* (SCACCHI, 1836)**

One empty shell found in a death colony of sponge, *Verongia aerohoba* at a depth of ca. 2 m in Saros Bay (NE Aegean Sea); one alive specimen found under a stone over the sandy ground at a depth of ca. 5 m in waters of Esek Island, Cesme (central Aegean Sea). Shell conical with rather inflated whorls. Protoconch consisting of 3 rounded, blunt tipped whorls. Whitish background with a few pinkish- to lilac-brown blotches. Sculpture of 12-14 strong ribs, about equal to the interspaces and strong, equally spaced, smooth spiral chords. Outer lip thickened but smooth internally.



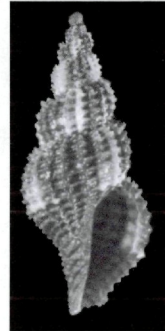
**14. *Raphitoma (Leufroyia) leufroyi* (MICAUD, 1828)**

One empty shell was collected over sandy bottom at a depth of ca. 1 m in Dalyan Bay, Cesme (central Aegean Sea). Shell is conical with rounded whorls. Protoconch consisting of three rounded whorls. Teleconch whorls of a white to yellowish base colour with brown patches scattered on some of the ribs. A median, opaque white coloured, spiral band is always present and quite distinct. Twelve to 14 strong ribs and unequally spaced spiral chords alternating with weaker ones; there are 8-10 stronger spirals on the penultimate whorl. Outer lip thick, smooth internally with a sharp edge.



**15. *Philbertia papillosa* PALLARY, 1904**

One alive specimen was collected under a stone over sandy bottom at a depth of ca. 30 cm in Kadirga Bay, Assos (NE Aegean Sea). Shell is slender-fusoid, thin, but solid. Light-dunnish, with white blotches. Teleconch with 7-8 convex whorls with deep suture. Sculpture on the penultimate whorl with 24 or fewer narrow ribs with nearly 20 spirals. Crossing points delicately tit-shaped, papillous. Tail well-marked, with deep sinus and short canal.



**16. *Philbertia philberti* (MICAUD, 1829)**

One empty shell was collected over sandy bottom at a depth of 20-30 cm in waters of Bozcada (NE Aegean Sea). Shell is solid and fusoid. Protoconch paucispiral with two spirally sculptured whorls. Shell with brownish shades, often variagated in white. Sculpture of teleconch consisting of nearly 18 axial ribs on the body whorl, with thin spiral chords, causing rectangular cancellations. Canal short.



Sixteen turrid gastropods recorded in the present study have been previously reported by many researchers from Turkish seas (Table 1); however, most of them did not provide neither illustrations nor pictures of the examined shells. Regarding the identification of turrids, one of the most confusing and variable groups of marine gastropods, appropriate illustrations or pictures are of high importance. With this respect, authors attempted to provide a pictorial guide of the examined shells in the present study, which is a part of a more extensive survey of mini-gastropods of Turkish malacofauna.

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Table 1. Previous recordings of the identified turrids from Turkish waters by different authors

IDENTIFIED SPECIES	PREVIOUS RECORDINGS IN TURKISH WATERS						
	BUZZURRO & GREPPI (1996)	DEMIR (2003)	KABASAKAL & KABASAKAL (2005)	ÖBERLING (1969-1971)	ÖZTURK (2001)	ÖZTURK & CEVİK (2000)	ÖZTURK et al. (2003)
<i>Bela brachystoma</i> (PHILIPPI, 1844)	+	+	+		+	+	
<i>Bela</i> cfr. <i>nebula</i> (MONTAGU, 1803)	+	+	+		+	+	+
<i>Mangelia paciniana</i> (CALCARA, 1839)		+			+		
<i>Mangelia smithii</i> (FORBES, 1840)	+	+				+	
<i>Mangelia stossiciana</i> BRUSINA, 1869		+	+				
<i>Mangelia unifasciata</i> (DESHAYES, 1835)	+	+			+	+	+
<i>Mangelia vauquelini</i> (PAYRAUDEAU, 1826)	+		+	+		+	+
<i>Mangiliella taeniata</i> (DESHAYES, 1835)		+	+		+	+	+
<i>Crassopleura incrassata</i> (DUJARDIN, 1837)	+	+			+	+	
<i>Raphitoma (Raphitoma) laviae</i> (PHILIPPI, 1844)	+		+		+	+	+
<i>Raphitoma (Raphitoma) linearis</i> (MONTAGU, 1803)	+	+	+		+	+	+
<i>Raphitoma (Raphitoma) purpurea</i> (MONTAGU, 1803)		+		+		+	
<i>Raphitoma (Leufroyia) concinna</i> (SCACCHI, 1836)		+	+			+	+
<i>Raphitoma (Leufroyia) leufroyi</i> (MICHAUD, 1828)	+	+				+	
<i>Philbertia papillosa</i> PALLARY, 1904		+	+				+

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