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Distribution of blackchin guitarfish *Rhinobatos cemiculus* E. Geoffroy Saint-Hilaire, 1817 (Elasmobranchii: Rhinobatidae) with first records from İzmir Bay (Turkey, northeastern Aegean Sea)

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Abstract: Blackchin guitarfish, *Rhinobatos cemiculus*, is rather abundantly captured in the eastern tropical Atlantic, especially off Senegal and Mauritania. In the Mediterranean western basin, *R. cemiculus* is unknown at present off the European shore but is rather frequent off southern areas; conversely, the species occurs throughout the eastern basin. Two large specimens recorded for the first time in İzmir Bay, northern Aegean Sea, are reported and described in this note. These findings constitute the northernmost records of *R. cemiculus* in both the Aegean Sea and the Mediterranean Sea, and they significantly extend the species' distribution known to date.

Key words: Chondrichthyes, *Rhinobatos cemiculus*, first records, range extension, İzmir Bay, Aegean Sea

1. Introduction

Blackchin guitarfish, *Rhinobatos cemiculus* E. Geoffroy Saint-Hilaire, 1817, is a rather large rajiforme species inhabiting sandy and muddy bottoms at low depths not exceeding 50–60 m in temperate and warm temperate waters in the eastern Atlantic and in the Mediterranean Sea, which generally enters shallow coastal waters (McEachran and Capapé, 1984). North of the Strait of Gibraltar, *R. cemiculus* is only known off Portugal (Albuquerque, 1954–1956; Quérou et al., 2003); south of this strait, *R. cemiculus* is reported from off Morocco (Lloris and Rucabado, 1998), Mauritania (Valadou et al., 2006), and Senegal (Seck et al., 2004) to the Gulf of Guinea (Blache et al., 1970). The species was reported off Angola following McEachran and Capapé (1984) and is probably replaced by other congeneric rhinobatids in southern African waters (Smith and Heemstra, 1986).

R. cemiculus is considered as rather abundant off the Senegalese coast, where it is captured for local consumption as fresh or dried fish; this latter preparation is known under the vernacular name of “sali”, made from both sharks and batoids (Seck et al., 2004). Sali is consumed by the Senegalese population but is also exported to other African countries, according to Diatta et al. (2009), who added that finning of rhinobatid species is unfortunately often practiced by fishermen. Additionally, these captures allowed Seck et al. (2004) to expand and improve preliminary data

from Capapé et al. (1996) about size at birth, size at sexual maturity, maximal size, reproductive cycle, and fecundity of *R. cemiculus* from the Senegalese coast.

In the northwestern Mediterranean basin, no records of *R. cemiculus* have been reported off France (Capapé, 1977; Capapé et al., 2006); the species has occurred only in the Italian seas, especially around Sicily (Tortonese, 1956). At present, blackchin guitarfish is completely extirpated and has disappeared from these areas (Psomadakis et al., 2009), together with its close relative and sympatric species, common guitarfish *R. rhinobatos* (Linnaeus, 1758); additionally, *R. cemiculus* was not reported in the Adriatic Sea by Lipej and Dulcic (2010). Conversely, the occurrence of *R. cemiculus* is well-documented from the southern regions of the western Mediterranean basin, such as the Maghreb shore from Morocco (Lloris and Rucabado, 1998) to Tunisian waters, where the species is caught in brackish areas such as the southern Lagoon of Bibans, which has an established sustainable population (Zaouali and Beaten, 1985; Capapé et al., 2004a). The species has migrated northward to Tunis Southern Lagoon, where several specimens were caught after a recent environmental restoration (Mejri et al., 2004). Conversely, blackchin guitarfish is unknown in the northern Lagoon of Bizerte where other elasmobranchs, mainly torpedinid and dasyatid species, develop and reproduce (El Kamel et al., 2009; Capapé et al., 2012).

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In the eastern Mediterranean basin, *R. cemiculus* is reported in southern areas from the Tunisian border to the Suez Canal (Tortonese, 1939, 1956; McEachran and Capapé, 1984; El-Sayed, 1994), where it is generally caught together with *R. rhinobatos* and other large elasmobranch species. Eastward, captures of blackchin guitarfish are well documented from the Levant basin, such as off Lebanon (Mouneimné, 1977), Israel (Golani, 2005), and especially Syria, where investigations recently carried out by Ali et al. (2008) provided information about some traits of the reproductive biology of the species. Northward, *R. cemiculus* is a prevalent species in İskenderun Bay, located on the northeastern Mediterranean coast of Turkey (Keskin et al., 2011; Başusta et al., 2012). Keskin et al. (2011) recorded that the frequency of occurrence of this species was 14% of the bottom trawl hauls in İskenderun Bay during November 2007, January 2008, and August 2008 (depth range: 63–65 m).

The 1960s studies on the ichthyofauna from the Turkish part of the Aegean Sea mostly focused on İzmir Bay and its related areas, including Gediz Estuary (40,000 ha) and 3 lagoons having a total of 2949 ha, likely considered among the most important fish nursery and recruitment areas. The area has, therefore, been closed for bottom trawlers for the past 2 decades and for purse-seiners since 2000. Artisanal small-scale fishery such as gillnets, trammel nets, and longlines are thus the main fishing methods currently used in the area (Akyol et al., 2011). With regard to İzmir

Bay and its related areas, 39 chondrichthyan species and 237 osteichthyan species have been identified (Geldiay, 1969). Studies conducted between 1969 and 2011 have reported a total of 79 rare and little-known fish species in İzmir Bay; additionally, it has been anticipated that some new uncommon fish species could be added to the local ichthyofauna (Akyol et al., 2011, 2013).

The first records of *R. cemiculus* in the northern Aegean Sea offer an opportunity to improve and enlarge both distribution and reproductive knowledge of a species considered as one of the most endangered in the Mediterranean Sea. In addition, this study suggests a thorough reconsideration of the species' occurrence in the area, in order to assess its real status and concomitantly prepare a local monitoring plan for elasmobranch species in the same region.

2. Materials and methods

On 12 and 25 April 2013, 2 specimens of *R. cemiculus* were captured by trammel nets having between 60 and 72 mm mesh size from off the Urla coast, in İzmir Bay (Figure 1) at a depth of between 6 and 8 m on sandy bottom. The first specimen was a female having a total length (TL) of 1635 mm captured at 38°22'N and 26°5'E; unfortunately, it was immediately sold at a fish auction by the Urla fishery cooperative. The second specimen was a male of 1571 mm TL and 13,228 g in weight (Figure 2), captured at 38°23'N and 26°45'E; measurements to the nearest millimeter

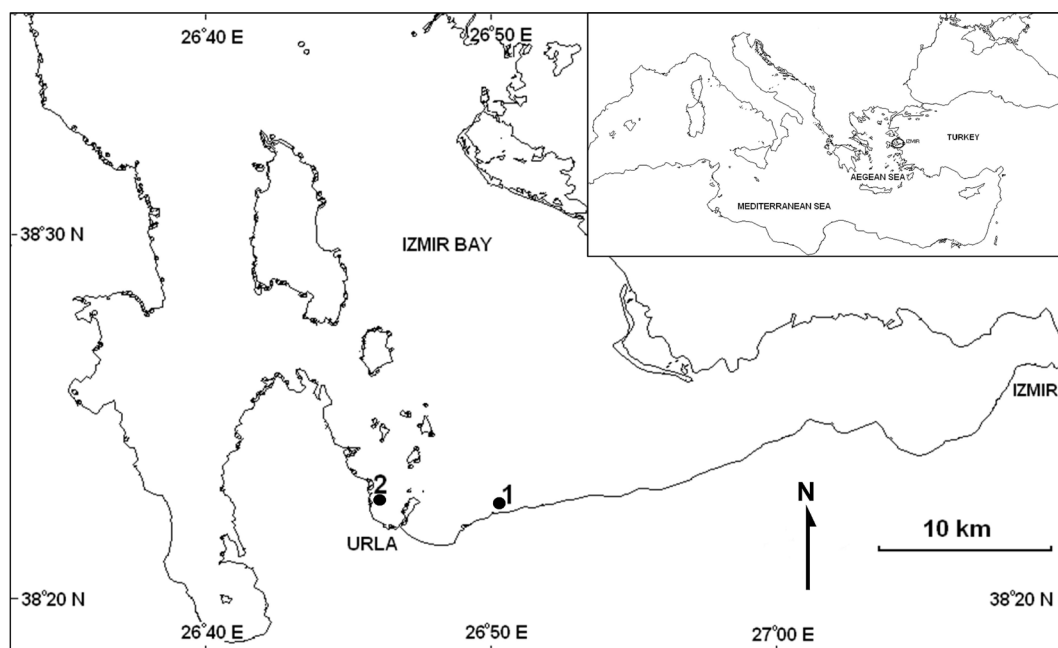


Figure 1. Insert showing a map of the Mediterranean Sea including the Aegean Sea and the study area (black circle). Map of İzmir Bay indicating the capture sites of both *Rhinobatos cemiculus* (1 = large female; 2 = large male).

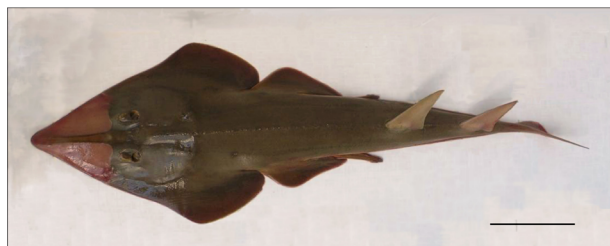


Figure 2. Large male of *Rhinobatos cemiculus* (ref. ESFM-PIS/2013-001), captured in İzmir Bay (scale bar = 200 mm).

were carried out on this specimen following Capapé et al. (1981), McEachran and Capapé (1984), and Mejri et al. (2004) and are included in Table 1, together with percentage of TL for each measurement. This specimen was preserved in 10% buffered formalin and deposited in the Ichthyological Collection of Ege University, Fisheries Faculty, under catalog number ESFM-PIS/2013-001.

3. Results and discussion

Both *R. cemiculus* specimens were identified as follows: disc subtriangular with elongated snout, with rostral ridges narrowly separated, slightly converging at midline; first dorsal fin largely behind tip of pelvic fins; anterior nasal lobes not reaching to level of inner corner of nostril; tail large and broad, distinctly marked on the disc, depressed dorsoventrally with well-developed lateral folds; dorsal and ventral surface entirely smooth; thorns present around inner margins of orbits, between spiracles and shoulders, and along midline of disc and tail; dorsal surface brownish with transversal darker strips on tail, rather beige on outer margins of disc and tail, belly rather white.

Morphometric measurements in male specimen were as follows: standard length 83.4%, disc length 26.7%, disc width 29.9%, preorbital length 15.3%, preoral length 16%, all TL (Table 1). Additionally, all measurements, counts, and color patterns herein determined are in total agreement with previous studies carried out by Norman (1926), Capapé et al. (1981), McEachran and Capapé (1984), Mejri et al. (2004), and Ben Souissi et al. (2007).

The male described in this paper is the largest male *R. cemiculus* recorded to date in the eastern Mediterranean; the female is a little smaller than the female caught off Syria (Table 2). The specimens from the eastern Mediterranean are smaller than those reported from the western basin, the coast of Tunisia, and especially from the eastern tropical Atlantic (Table 2). These intraspecific latitudinal differences in size could be due to the fact that in some areas specimens mature at a smaller size and consequently reach a larger maximal size (Mellinger, 1989). Capapé et al. (2004b) noted that environmental factors probably play a role with special regard to size at sexual maturity and maximal size in elasmobranch species, but this remains

Table 1. Morphometric measurements in mm and as percentage of total length (% TL) recorded in the large male of *Rhinobatos cemiculus* (ref. ESFM-PIS/2013-001), captured in İzmir Bay.

Measurements	mm	% TL
Total length (TL)	1571	100.0
Standard length (SL)	1310	83.4
Disc length	420	26.7
Disc width	470	29.9
Eye diameter	16	1.0
Preorbital length	241	15.3
Interorbital width	85	5.4
Spiracle length	33	2.1
Preoral length	252	16.0
Snout to nostrils	228	14.5
Snout to first gill slit	353	22.5
Snout to disc	219	13.9
Snout to first dorsal	940	59.8
Snout to pelvic	558	35.5
Snout to spiracle	272	17.3
First to second dorsal	235	15.0
Between dorsal bases	156	9.9
Pelvic to anal	83	5.3
Second dorsal to upper caudal	158	10.1
Anal to lower caudal	655	41.7
Pelvic to median tip	278	17.7
Upper caudal	265	16.9
Lower caudal	94	6.0
Mouth width	106	6.7
Internasal width	47	3.0
Interspiracular width	80	5.1
Width between first gill slit	196	12.5
Width between fifth gill slit	146	9.3
1st gill slit	22	1.4
2nd gill slit	23	1.5
3rd gill slit	24	1.5
4th gill slit	24	1.5
5th gill slit	20	1.3

Table 2. Sizes at sexual maturity and maximal sizes of *Rhinobatos cemiculus* reported from different marine areas of the eastern tropical Atlantic and the Mediterranean Sea (in mm).

Ocean or sea	Area	Size at sexual maturity		Maximal size		Authors
		Males	Females	Males	Females	
Eastern Atlantic	Coast of Senegal	1550	1630	2330	2450	Seck et al. (2004)
Eastern Atlantic	Coast of Mauritania	1533	1547	2120	2900	Valadou (2003)
Mediterranean	Coast of Tunisia	1000	1100	1920	2300	Capapé and Zaouali (1994)
Mediterranean	Tunis Southern Lagoon	-	-	-	823	Mejri et al. (2004)
Mediterranean	Coast of Syria	>828	>873	1385	1646	Ali et al. (2008)
Mediterranean	Rhodes Island	-	-	-	-	Corsini-Foka (2009)
Mediterranean	İskenderun Bay, Turkey	-	-	-	1490	Başusta et al. (2012)
Mediterranean	İzmir Bay, Aegean Sea, Turkey	-	-	1571	1635	This study

difficult to assess. For instance, *R. cemiculus* specimens from the Senegalese coast are larger than those collected off the Tunisian coast; conversely, *R. rhinobatos* specimens are larger in the latter area than in the former (Capapé et al., 1999). Biological environment cannot be totally excluded, as availability of food considerably reduces intra- and interspecific competition pressure for prey (Heithaus, 2004; Wetherbee and Cortes, 2004), but also affects reproductive mode, especially in deep-sea waters where prey is rather scarce (Capapé et al., 2003). In Table 2, it appears that in all areas females are larger than males, and Mellinger (1989) noted that this phenomenon is especially marked in viviparous species. This is due to the fact that the female carries the brood throughout gestation and consequently contributes to embryonic development by providing organic and inorganic nutrients; this is probably the case for *R. cemiculus* from İzmir Bay, even if such a hypothesis is only supported by 2 records.

R. cemiculus was not reported in the recent rare fish list resulting from observations carried out between 1969 and 2008 (Akyol et al., 2011); consequently, this ichthyological note represents a clear indication of first records of *R. cemiculus* in the northernmost part of the Aegean Sea.

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