

RANGE EXTENSION AND ADDITIONAL RECORDS OF THE YELLOWMOUTH BARRACUDA, *SPHYRAENA VIRIDENSIS* (ACTINOPTERYGII: PERCIFORMES: SPHYRAENIDAE) IN THE EASTERN ADRIATIC SEA

Jakov DULČIĆ¹, Marcelo KOVAČIĆ², and Branko DRAGIČEVIĆ^{1*}

¹ *Institute of Oceanography and Fisheries, Split, Croatia*

² *Prirodoslovni Muzej Rijeka, Šetalište Vladimira Nazora 3, 53000 Rijeka, Croatia*

Dulčić J., Kovačić M., Dragičević B. 2009. Range extension and additional records of the yellowmouth barracuda, *Sphyraena viridensis* (Actinopterygii: Perciformes: Sphyraenidae) in the eastern Adriatic Sea. Acta Ichthyol. Piscat. 39 (1): 59–61.

Abstract. One specimen (TL = 532 mm, *W* = 662 g) of the yellowmouth barracuda, *Sphyraena viridensis*, was caught by an angler on 3 August 2008 in front of the Port of Rijeka (Northern Adriatic). Being caught at the geographic latitude of 45°17'N, makes this record the northernmost occurrence of this species in the Mediterranean.

Keywords: additional record, range extension, yellowmouth barracuda, *Sphyraena viridensis*, Adriatic Sea

The yellowmouth barracuda, *Sphyraena viridensis* Cuvier, 1829, has been known to occur in the Eastern Central Atlantic and Mediterranean (De Sylva 1990). It has also been reported from the Azores islands (Barreiros et al. 2002). However, because of its similarity to *Sphyraena sphyraena* (L.), this species is rarely reported and therefore its exact distribution and abundance is poorly known in the Mediterranean. Moreover, even in scientific literature these two species were often considered as two forms of *S. sphyraena* (cf. Relini and Orsi Relini 1997). The first record of *S. viridensis* in the Adriatic was based on three specimens that were caught in September 2003 off Dubrovnik (southern Croatia) (Kožul et al. 2005). Additionally, three specimens were caught in July 2004 off the shore of Herceg Novi, Montenegro (Dulčić and Soldo 2004).

The aim of this paper is to present new records including the northernmost record of the yellowmouth barracuda for the Mediterranean and to discuss its distribution in the Adriatic.

A single specimen (TL = 532 mm, *W* = 662 g) (Fig. 1) of the yellowmouth barracuda, *S. viridensis*, was caught by an angler on 3 August 2008 in front of the Port of Rijeka (Northern Adriatic) (Fig. 2). Being caught at the geographic latitude of 45°17'N, makes this record the northernmost occurrence of this species in the Mediterranean Sea. The specimen is deposited in the collection of the Natural History Museum Rijeka (PMR VP 1940). Additionally, after re-examination of the *Sphyraena* specimens, it was found that specimen under collection number PMR VP 590, previously determined as *Sphyraena sphyraena*, is actually *S. viridensis*. This specimen (TL = 607 mm,



Fig. 1. Specimen of *Sphyraena viridensis*, 532 mm TL, captured in front of the Port of Rijeka (Northern Adriatic) on 3 August 2008

* Correspondence: Branko Dragičević, Institut za oceanografiju i ribarstvo, POB 500, Šetalište Ivana Meštrovića 63, 21000 Split, Croatia, phone: (+385) 21 408 013, fax: (+385) 358 650, e-mail: brankod@izor.hr

Table 1

Morphometric and meristic characters of two specimens of *Sphyræna viridensis* from the Kvarner area, Northern Adriatic Sea

	Character	Value	
		specimen 1*	specimen 2**
Morphometric [mm]	TL (Total length)	532	607
	SL (Standard length)	462	531
	LC (Head length)	145	157
	LPD1 (First predorsal length)	211	239
	LPD2 (Second predorsal length)	329	385
	LPP (Prepectoral length)	147	159
	LPV (Preventral length)	214	233
	LPA (Preanal length)	347	384
	Maximal body depth	57	71
	Depth D1 (Depth of fish under the first dorsal fin)	56	69
	Depth D2 (Depth of fish under the second dorsal fin)	53	65
	Snout to orbit	71	79
	Eye horizontal diameter	18	18
	Meristic	D1 (First dorsal fin)	V
D2 (Second dorsal fin; the last bifid counted as 1)		I/8	I/8
V (Pelvic fins)		I/5	I/5
A (Anal fin; the last bifid counted as 1)		I/8	Damaged
P (Pectoral fins)		14	14
LL (Linea lateralis)		153	157
Scales above lateral line at D1		22	21

Voucher specimen numbers: *PMR VP1940; **PMR VP590.

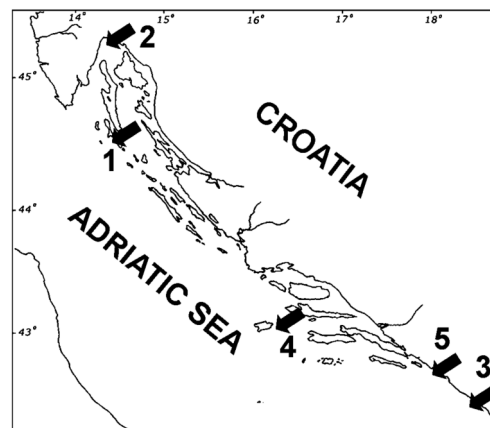


Fig. 2. Map showing localities where the specimens of *Sphyræna viridensis* were caught; the numbers on the map are in chronological order of captures; for additional data see Table 2

$W = 987$ g) was caught by a spear gun on 18 November 1997 near Koludarc Island (Island Mali Lošinj, Northern Adriatic) at about 3 m depth. Both specimens were weighed to the nearest 1 g and all morphometric measurements were measured to the nearest 1 mm. These measurements, as well as meristic counts, are presented in Table 1 and are consistent with those presented by Relini and Orsi Relini (1997). According to the date of capture of the latter specimen, it is clear that it should be consid-

ered as the earliest date of collection of *S. viridensis* in the Adriatic, since the previously published first record by Kožul et al. (2005) was based on specimens caught in 2003. Additionally, one specimen of female *S. viridensis* (TL = 751 mm, $W = 1234$ g) was caught on 25 April 2008 by gillnet in the Zagrav Bay (Island of Vis, middle Adriatic). This specimen was identified from the photographs which clearly showed that the area behind the eye and the back margin of the preoperculum were free of

Table 2

Complete list of localities where *S. viridensis* occurred in the Adriatic Sea

Record No.	Date	Coordinates	Locality	Reference
1	18 Nov 1997	44°32'N 14°25'E	Koludarc Island (Island Mali Lošinj, Northern Adriatic)	This paper
2	Sep 2003	42°38'N 18°06'E	Dubrovnik, southern Croatia (3 specimens)	Kožul et al. 2005
3	July 2004	42°26'N 18°32'E	Off the shore of Herceg Novi (Montenegrin coast)	Dulčić and Soldo, 2004
4	25 Apr 2008	43°01'N 16°13'E	Zaglav Bay (Island of Vis, middle Adriatic)	This paper
5	3 Aug 2008	45°17'N 14°28'E	In front of the Port of Rijeka (Northern Adriatic)	This paper

scales and distinctive cross bars on the flanks were present which, according to Relini and Orsi Relini (1997), are a determinative traits of *S. viridensis*. This specimen also had well developed female gonads in pre-spawning stage which indicate the approach of the spawning period for this species, probably in May or June.

Description of the Adriatic specimens: tip of pelvic fins not reaching the bases of ventral fins; 35–36 lateral line scales in front of vertical of first dorsal fin anterior end; no scales in the ventral area of preoperculum and along posterior margin of preoperculum; dark bars along upper half of body ending downwards below lateral line.

Some of these characteristics can also be used to distinguish *S. viridensis* from *S. sphyraena*. The latter have continuous scale covering on the preoperculum and the colour is dark above and silvery below the lateral line without pronounced cross bars on the flanks. Furthermore, in *S. viridensis* the anal fin is grey, sometimes with white margins, while in *S. sphyraena* it is all whitish (Relini and Orsi Relini 1997).

Maximum reported length for this species in its area of distribution is 1280 mm (fork length FL) and maximum weight 8200 g according to IGFA (Anonymous 2001). Until now, maximum reported length of *S. viridensis* for the Adriatic Sea was 515 mm TL ($W = 419$ g) (Dulčić and Soldo 2004), but according to this study, this should be changed to TL = 751 mm ($W = 1234$ g).

It is clear from Fig. 2 that *S. viridensis* has wide latitudinal distribution in the Eastern Adriatic, being recorded in its southern, middle and northernmost part. Complete list of localities where *S. viridensis* occurred in the Adriatic Sea are given in Table 2. Furthermore, these new records suggest that this species has wider distribution and is more abundant in the Adriatic than previously thought. It is also evident that this species occurs in the Adriatic much earlier (in 1997) than previous investigations shows (in 2003 and 2004). The possibility that *S. viridensis* is not a recent immigrant, but rather common

and overlooked inhabitant of the Adriatic should not be totally excluded. Because of the confusion with closely related Mediterranean species *S. sphyraena*, status and distribution of this species in the Mediterranean and the Adriatic is still poorly known.

ACKNOWLEDGEMENTS

We thank to the Ministry of Science, Education and Sport of Republic Croatia for financial support of Project 001-0013077-0844. We also thank Mirza Matuljan and Igor Morin for providing us with the specimen.

REFERENCES

- Anonymous 2001. Database of IGFA angling records until 2001. IGFA, Fort Lauderdale FL, USA.
- Barreiros J.P., Santos R.S., De Borba A.E. 2002. Food habits, schooling and predatory behaviour of the yellowmouth barracuda, *Sphyraena viridensis* (Perciformes: Sphyraenidae) in the Azores. *Cybio* **26**: 83–88.
- De Sylva D.P. 1990. Sphyraenidae. Pp. 860–864. In: Quero J.C., Hureau J.C., Karrer C., Post A., Saldanha L. (eds.) Check-list of the fishes of the eastern tropical Atlantic. Vol. 3. (CLOFETA). JNICT, Lisbon; SEI, Paris; and UNESCO, Paris.
- Dulčić J., Soldo A. 2004. On the occurrence of the yellowmouth barracuda, *Sphyraena viridensis* Cuvier, 1829 (Pisces: Sphyraenidae), in the Adriatic Sea. *Annales, Series Historia Naturalis*, **14**: 225–228.
- Kožul V., Tutman P., Glavić N., Skaramuca B., Bolotin J. 2005. First record of the yellowmouth barracuda, *Sphyraena viridensis* (Sphyraenidae) from Adriatic Sea. *Cybio* **29**: 201–202.
- Relini M., Orsi Relini L. 1997. The two species of barracuda (Sphyraenidae) in the Western Mediterranean. *Cybio* **21**: 216–222.

Received: 23 December 2008

Accepted: 23 March 2009

Published electronically: 20 May 2009