

**EASTERNMOST RECORD OF THE LANCET FISH, *NOTOSCOPELUS KROYERI*  
(ACTINOPTERYGII: MYCTOPHIFORMES: MYCTOPHIDAE),  
IN THE MEDITERRANEAN SEA**

Cetin KESKIN <sup>1\*</sup> and Lütfiye ERYILMAZ <sup>2</sup>

<sup>1</sup> *Department of Marine Biology, Fisheries Faculty, Istanbul University,*

<sup>2</sup> *Department of Biology, Science Faculty, Istanbul University Istanbul, Turkey*

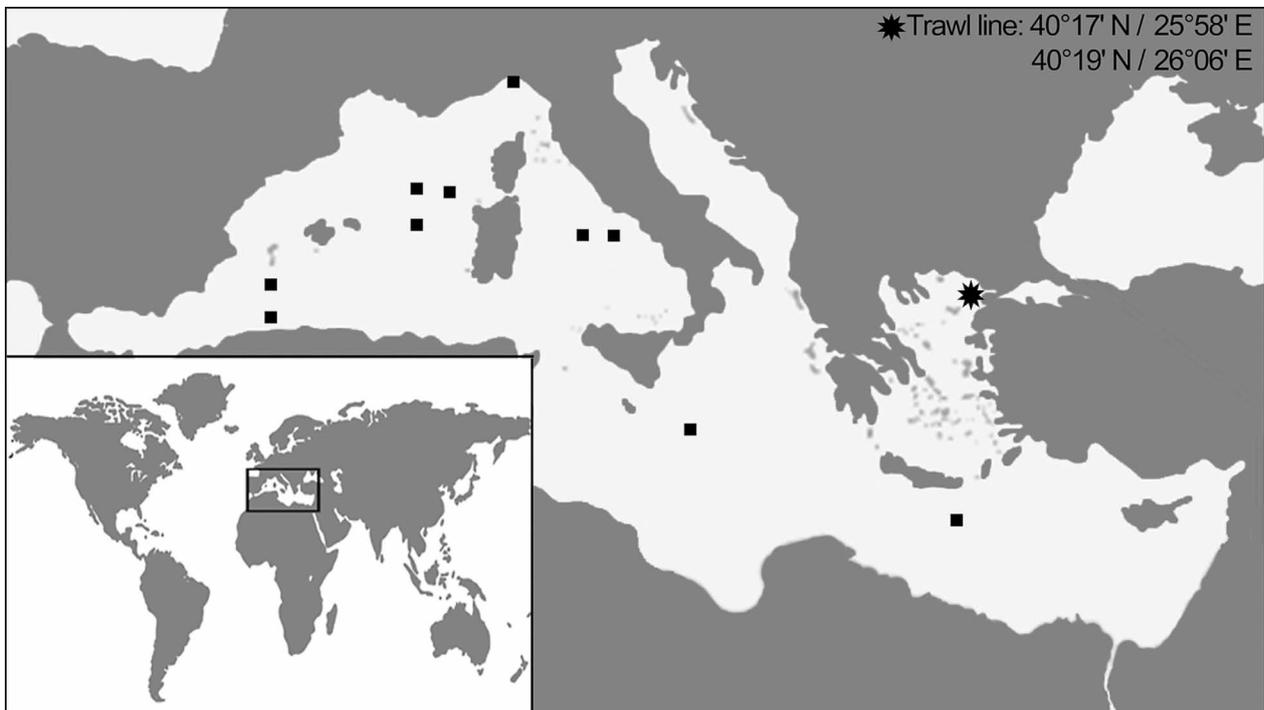
Keskin C., Eryilmaz L. 2010. Easternmost record of the lancet fish, *Notoscopelus kroyeri* (Actinopterygii: Myctophiformes: Myctophidae), in the Mediterranean Sea. *Acta Ichthyol. Piscat.* 40 (1): 79–81.

**Abstract.** One specimen of lancet fish, *Notoscopelus kroyeri* (Malm, 1861), was collected in March 2007 by commercial bottom trawl in the Aegean Sea. This record consists the easternmost record of lancet fish in the Mediterranean Sea. Morphometric and meristic characteristics of this species are given.

**Keywords:** *Notoscopelus kroyeri*, lancet fish, Myctophidae, first record, deep-sea fish, easternmost Mediterranean Sea

The Lancet fish, *Notoscopelus kroyeri* (Malm, 1861), is a species of the family Myctophidae. This family includes about 32 genera with at least 240 species (Nelson 2006). Five species are recognized in the genus *Notoscopelus* in the North-eastern Atlantic and the Mediterranean (Hulley 1984): *N. bolini* Nafpaktitis, 1975; *N. caudispinosus* (Johnson, 1863);

*N. elongatus* (Costa, 1844); *N. kroyeri* (Malm, 1861); and *N. resplendens* (Richardson, 1845). *N. kroyeri* is a mesopelagic species found in depths ranging from 325 m to deeper than 1000 m. During the day, it is nyctoepipelagic at surface and down to 125 m (maximum abundance at 0–40 m) (Hulley 1984).

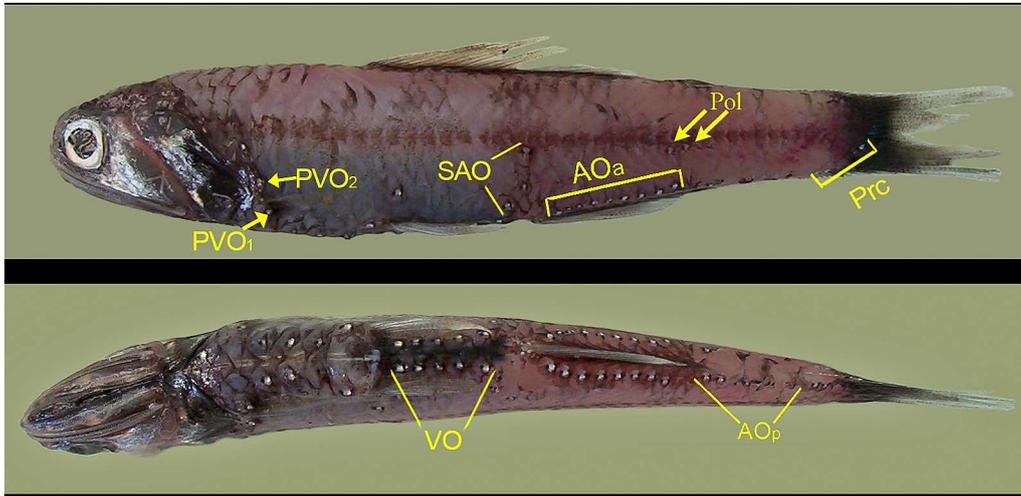


**Fig. 1.** Museum records of *Notoscopelus kroyeri* in the Mediterranean Sea (■) by Froese and Pauly (2009), and sampling location in the present study (\*)

\* Correspondence: Dr. Cetin Keskin, İstanbul Üniversitesi, Su Ürünleri Fakültesi, Ordu C. 200, Laleli, 34470 İstanbul, Turkey, phone: +90 212 455 57 00, fax: +90 212 514 03 79, e-mail: seahorse@istanbul.edu.tr.

*N. kroyeri* has been reported so far from western North Atlantic (Nafpaktitis et al. 1977) and the Flemish Cap (an area of shallow waters in the North Atlantic Ocean centred roughly at 47°N, 45°W or about 350 miles (560 km) east of St. John's, Newfoundland and Labrador) (Bañón et al. 2001). Although Hulley (1984) reported that distribution area of *N. kroyeri* is restricted to the northern Atlantic, in the east-

ern sector between 37°N and the Arctic Circle and in the western sector between 40°N and 60°N, this species is given such records based on museum collections also in the western Mediterranean Sea (e.g., Malta, West Italy, Southern Crete) (Froese and Pauly 2009) (Fig. 1). *N. kroyeri* was included in the list of Mediterranean fish biodiversity by Quignard and Tomasini (2000) who did not indi-



**Fig. 2.** Specimen of *Notoscopelus kroyeri* (IUSHM 37920-255; TL: 140 mm) caught in the Mediterranean Sea

**Table 1**

Comparisons of morphometric and meristic characteristics of *Notoscopelus kroyeri* in the present study and other studies (measurements in mm)

Characteristics	Present study	Nafpaktitis et al. 1977	Hulley 1984	Bañón et al. 2001
Total length	140	23–133	143	84–132
Standard length (SL)	117			
Fork length	125			
Head length (HL)	31			
Upper jaw length	23.2			
Lower jaw length	23.1			
Snout length	4.6			
Eye diameter	8			
Predorsal length	43.8			
Dorsal fin base length	30			
Preanal length	70			
Anal fin base length	21.1			
Head length in SL	3.8	3.5–3.8		
Upper jaw length in SL	5.0	4.5–5.2		
Eye diameter in SL	14.6	12.5–15		
Snout length in HL	6.7			
Eye diameter in HL	3.9	3.8–4		
Upper jaw length in HL	1.3	1.3–1.4		
Eye diameter in upper jaw length	2.9	2.8–3		
Dorsal fin rays	22	21–22	22(21)	22(21)
Anal fin rays	18	19(18–20)	19(18–20)	19(18–20)
Pectoral fin rays	13	13	12–13	12–13
Ventral fin rays (left/right)	7/9			
Gill rakers	8+1+17 total 26	(8–9)+1+(17–19) (20) total 26–29 (30)	8+1+17(18) total 26 (27)	(8–9)+1+(17–18) total 26–28
AO (AOa+AOo)	9+7 total 16	9(8–10)+7(6–8) total 16 (15–17)	9(10)+7(6–8) total 16 (15–18)	9(8–10)+7(6–8) total 16 (15–18)
Lateral-line organs	42	42–43		

cate where it was found in this sea nor did they give its morphomeristic characters. Considering to the above-mentioned knowledge on the distribution areas of *N. kroyeri*, this paper represents the easternmost record of this species in the Mediterranean Sea.

A 140 mm (TL) specimen was caught between 40°17'N and 25°58'E, and between 40°19'N and 26°06'E in the North Aegean Sea in March 2007 during the day by commercial bottom trawl, at depth between 475 m and 350 m (Fig. 1). The specimen was fixed and preserved in 5% formalin solution and deposited in the Istanbul University, Science Faculty, Hydrobiology Museum, Istanbul (IUSHM 37920-255) (Fig. 2). Measurements were made with dial callipers and recorded to 0.1 mm. The species name was attributed following Eschmeyer (1998).

Diagnostic characters of the specimen were measured following Nafpaktitis et al. (1977) and Hulley (1984). The diagnostic characters of the lancet fish in this study and in accordance with those observed in other areas are given in Table 1.

**The description of the captured specimen is as follows:** Head and body compressed, eyes large and lateral; mouth large, jaws extending more than one eye diameter behind posterior margin of orbit; AO series divided into AOa and AOp, the last AOa raised, AOp behind base of anal fin; two Pol, horizontally arranged at lateral line; VO 5; SAO 3; VO<sub>5</sub>, SAO<sub>1</sub> and SAO<sub>2</sub> equidistant and nearly in a straight line. PVO 2, PVO<sub>2</sub> well above level of upper end of base of pectoral fin; last Prc below level of lateral line. Origin of dorsal fin slightly in advance of ventral fin base. Origin of anal fin behind of middle of dorsal fin base. Pectoral fins short, not reaching the bases of ventral fins; ventral fins extending to anus. Adipose fin origin slightly in advance of end of anal fin base.

All counts and measurements agree with descriptions of *N. kroyeri* given by Nafpaktitis et al. (1977) and Hulley (1984). *N. kroyeri* can be distinguished from other Atlanto-Mediterranean co-generic species of the genus *Notoscopelus* (*N. caudispinosus*, *N. resplendens*, and *N. elongatus*) by the large number of gillrakers (26–30; see Table 1), as compared to 25 or less in these species;

while from *N. bolini*, it can be separated by having 21–22 dorsal fin rays as compared to 23–26.

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#### REFERENCES

- Bañón Díaz R., Cerviño S., Campelos J.M.** 2001. Composición, distribución y descripción de mictófidios (Pisces, Myctophidae) encontrados en Flemish Cap (Atlántico noroeste) en verano de 1998. *Boletín, Instituto Español de Oceanografía* **17**: 287–294.
- Eschmeyer W.N.** 1998. Catalog of Fishes on-line [updated July 02, 2009]. <http://www.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>.
- Froese R., Pauly D.** Editors. 2009. FishBase. [version 06/2009] <http://www.fishbase.org>.
- Hulley P.A.** 1984. Myctophidae. Vol. I. Pp. 429–483. *In*: Whitehead P.J.P., Bauchot M.-L., Hureau J.-C., Nielsen J., Tortonese E. (eds.) *Fishes of the North-eastern Atlantic and the Mediterranean*. Paris, UNESCO.
- Nafpaktitis B.G., Backus R.H., Craddock J.E., Haedrich R.L., Robison B.H., Karnella C.** 1977. *Fishes of the western north Atlantic, Order Iniomi (Myctophiformes)*. Memoir 1, Part 7, 287 pp. Sears Foundation for Marine Research, Yale University, New Haven.
- Nelson J.S.** 2006. *Fishes of the world* (4th edn.). John Wiley and Sons, New York.
- Quignard J.P., Tomasini J.A.** 2000. Mediterranean fish biodiversity. *Biologia Marina Mediterranea* **7**: 1–66.

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