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

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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 Northeastern 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 nycotoipelagic at surface and down to 125 m (maximum abundance at 0–40 m) (Hulley 1984).

![Map showing museum records and sampling location](image-url)

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

| 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          | 125                      | 125         | 125               |
| Fork length                            | 125          | 125                      | 125         | 125               |
| Head length (HL)                       | 31           | 31                       | 31          | 31                |
| Upper jaw length                       | 23.2         | 23.2                     | 23.2        | 23.2              |
| Lower jaw length                       | 23.1         | 23.1                     | 23.1        | 23.1              |
| Snout length                           | 4.6          | 4.6                      | 4.6         | 4.6               |
| Eye diameter                           | 8            | 8                        | 8           | 8                 |
| Predorsal length                       | 43.8         | 43.8                     | 43.8        | 43.8              |
| Dorsal fin base length                 | 30           | 30                       | 30          | 30                |
| Preanal length                         | 70           | 70                       | 70          | 70                |
| Anal fin base length                   | 21.1         | 21.1                     | 21.1        | 21.1              |
| Head length in SL                      | 3.8          | 3.5–3.8                  | 3.5         | 3.5               |
| Upper jaw length in SL                 | 5.0          | 4.5–5.2                  | 4.5         | 4.5               |
| Eye diameter in SL                     | 14.6         | 12.5–15                  | 12.5        | 12.5              |
| Snout length in HL                     | 6.7          |                         |            |                   |
| Eye diameter in HL                     | 3.9          | 3.8–4                    | 3.8         | 3.8               |
| Upper jaw length in HL                 | 1.3          | 1.3–1.4                  | 1.3         | 1.3               |
| Eye diameter in upper jaw length       | 2.9          | 2.8–3                    | 2.8         | 2.8               |
| 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                       | 13          | 13                |
| Ventral fin rays (left/right)          | 7/9          |                          | 7/9         |                   |
| Gill rakers                             | 8+1+17       | (8–9)+1+(17–19) (20)     | 8+1+17(18)  | (8–9)+1+(17–18)   |
| total 26                               |              | total 26–29 (30)         | total 26   | total 26–28       |
| AO (AOa+AOp)                           | 9+7          | 9(8–10)+7(6–8)           | 9(10)+7(6–8)| 9(8–10)+7(6–8)   |
| total 16                               |              | total 16 (15–17)         | total 16(15–18)| total 16 (15–18) |
| Lateral-line organs                    | 42           | 42–43                    | 42          | 42–43             |

Table 1

Comparisons of morphometric and meristic characteristics of *Notoscopelus kroyeri* in the present study and other studies (measurements in mm)
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 fine; two Pol, horizontally arranged at lateral line; VO 5; SAO 3; VO3, SAO1 and SAO2 equidistant and nearly in a straight line. PVO 2, PVO2 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 \( \text{Notoscopelus} \) (\( N. \) 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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