

First Record of Thin-lipped Mullet, *Liza ramada* (Risso, 1827) (Actinopterygii: Mugilidae), in the Bulgarian Stretch of Maritsa River

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Abstract: Two specimens of *Liza ramada* have been caught in Maritsa River (Aegean Sea basin) at the town of Svilengrad in June 2016. This is the first record of the species in Bulgaria from a locality outside the Black Sea and its estuaries. The locality is situated at approximately 207 km from the mouth of the Maritsa (Evros) River making this record the farthest ever detected upstream migration of this species.

Key words: *Liza ramada*, Mugilidae, Maritsa River, Aegean Sea basin, upstream migration.

Introduction

The Thin-lipped Mullet, *Liza ramada* (Risso, 1826), is a pelagic species found in the Mediterranean Sea and the Black Sea as well as in the Eastern Atlantic from the Azores, Madeira, Portugal and Morocco northwards to the British Isles and Scandinavia, rarely in the Baltic Sea (TREWAVAS 1973, BEN-TUVIA 1986). It inhabits mainly coastal but also brackish waters of lagoons and estuaries, being more euryhaline than the other European mugilids. The species tolerates a wide range of salinities, from hypersaline conditions to pure fresh water, and has a pronounced tolerance for polluted waters (HARRISON 2003).

In Bulgaria, *L. ramada* is reported for the first time by CHICHKOFF (1912) from the Black Sea near Burgas. Later, NECHAEV (1933) found the species in Beloslav Lake, where in October 1932 he caught 28 adult specimens of both sexes, all with ripe gonads. Another specimen with a total length of 17 cm had been brought to him from the Burgas fish market. DRENSKY (1951) stated that he had never found the species near the Bulgarian coast of the Black Sea. According to GUEORGUIEV et al. (1960), *L. ramada* is very rare along the Bulgarian coast and only single specimens were caught in Mandra, Burgas and Varna Lakes. ALEKSANDROVA (1961) completed a

detailed study of the mugilids in the Bulgarian part of the Black Sea catching and tagging a total of 4387 specimens in the period 1956-1959 and not even a single specimen of thin-lipped mullets had been among them. STOYANOV et al. (1963) and, recently, KARAPETKOVA & ŽIVKOV (1995) stated that the species is rare in the Black Sea and only single individuals had been caught. The only author who reported that *L. ramada* is abundant and increased its numbers in the Bulgarian part of the Black Sea is SIVKOV (2000a, 2000b, 2003). He found the species in the coastal area of Cape Kaliakra as well as in Varna Bay and reported that its numbers had recently increased significantly (SIVKOV 2000a, 2003). In another paper, the same author made a morphological survey of the species from the Bulgarian part of the Black Sea (SIVKOV 2000b). According to him, in the autumn of 1991 in Varna Bay and later in winter in Varna Lake many thin-lipped mullets had been caught by the local fishermen and the following years the species became common all over the Bulgarian coast of the Black Sea. However, the latter paper is somehow ambiguous in terms of the morphological description of the species. In the text, it is mentioned that the head of the studied fish (a total of 100 specimens)

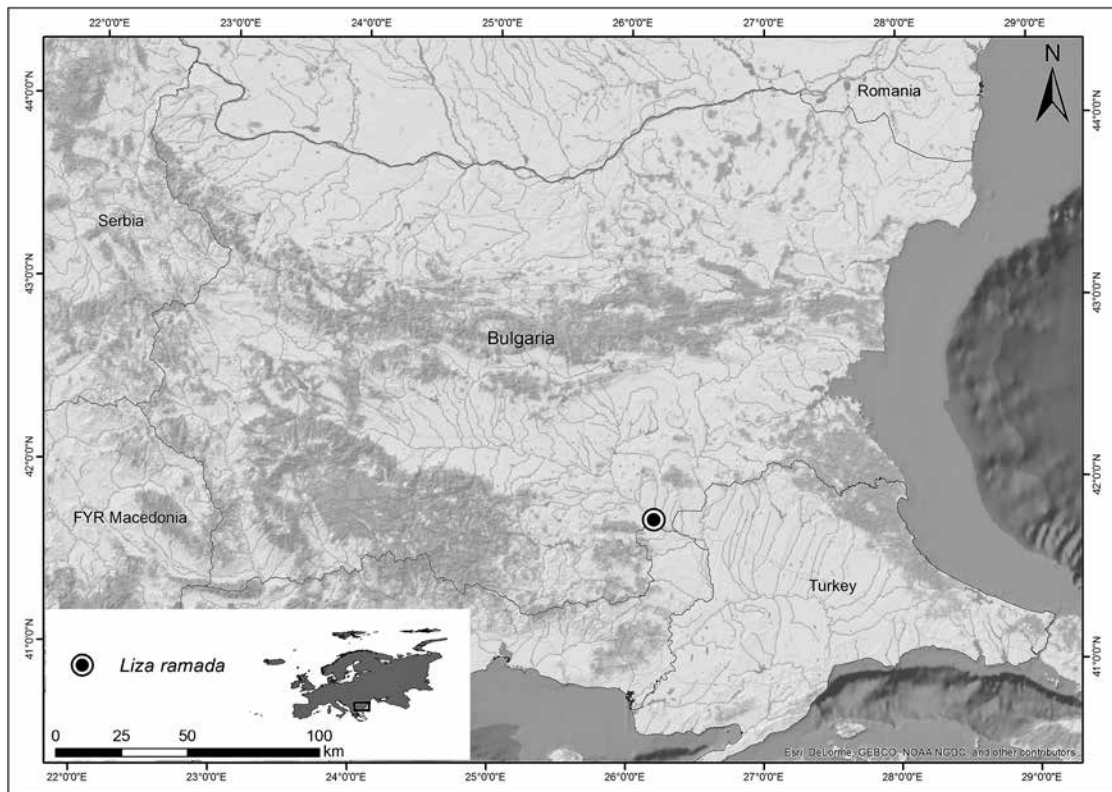


Fig. 1. Map of the locality where *L. ramada* was captured in Maritsa River.

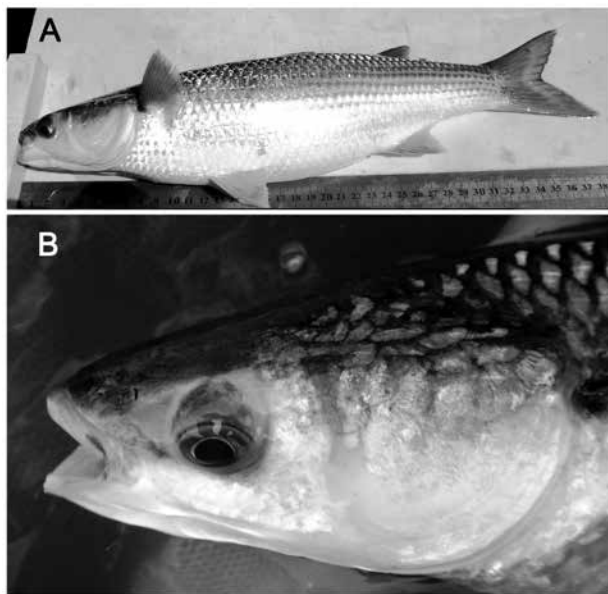


Fig. 2. *L. ramada* (395 mm TL) caught in Maritsa River in the town of Svilengrad. A. Lateral view of the body. B. View of the head.

had greater width than height as well as the pyloric caeca in all specimens were 6, which is not typical for *L. ramada*. The pyloric caeca in this species are usually 7-8 and extremely rarely they could be 6 or 9 (SVETOVIDOV 1964, HARRISON 2003). In the original illustration in the paper, few more features are

clearly visible: the tail fin is only slightly forked, the upper jaw is reaching beyond the anterior rim of the eye and the pectoral fin is somehow long and pointed but not typically rounded as it should be in *L. ramada*. In a personal conversation, the author confirmed that there is a lapsus in the title of the paper and the morphological description should refer to the species *Liza haematocheila* (TEMMINCK & SCHLEGEL, 1845) (Sivkov, pers. comm.). This fully coincides with the introduction of this species into the Black Sea basin. In the periods 1972-1980 and 1978-1984, the species has been translocated into lagoons of the Black Sea and the Sea of Azov, respectively, followed by three years of direct releases of hatchery produced fry. As a result, a self-reproducing population was established (STARUSHENKO & KAZANSKY 1996). Shortly after that, *L. haematocheila* became the most abundant mullet in the Black Sea basin (KAYA et al. 1998). Exactly in this period, Sivkov found it in big numbers near the Bulgarian coast.

In our opinion, the thin-lipped mullet is still rare along the Bulgarian coast of the Black Sea and only single specimens have been caught recently. Nowadays, the main catch of mugilids by Bulgarian fishermen is formed mainly by *Mugil cephalus* and *Liza aurata* and, to a lesser degree, by *Liza saliens*. Till now, no mugilid species has been caught outside the Black Sea basin in Bulgaria.

In this communication, we report the first case of capturing *Liza ramada* from the Bulgarian stretch of Maritsa (Evros) River, which belongs to the Aegean Sea basin.

Materials and Methods

On 24th of June 2016, two adult specimens of *Liza ramada* were caught in the Maritsa River at the town of Svilengrad (GPS coordinates: N 41° 46,364'; E 026° 11,602'; Fig. 1). They were caught during a field survey in the main river, from a place with high water velocity and sand-gravel bottom and with a depth of about 60 cm. Both fish were caught near the surface. The sampling was conducted using electro-fishing equipment (Hans Grassl IG 200-2) following the CEN standard (European standard EN 14011: 2003).

Results

Both specimens were adult females and their ovaries were not ripe. Their total length was 395 and 410 mm. They possessed the following morphological characters: Body with dark greyish dorsal coloration and silvery grey flanks with few darker longitudinal grey stripes. Blurred yellowish marking on both sides of the operculum and pale dark spot at the bases of pectoral fins. Pectoral fins relatively short and rounded (Fig. 2a). Both specimens with three spinous and nine articulated rays on the anal fin, four spinous rays on the first dorsal fin and nine articulated rays on the second dorsal fin. Lateral series of scales 46, body scales with only one lon-

gitudinal groove. Head scales extend anteriorly to the level of nostrils with some small scales in front of eyes. Anterior nostril closer to the posterior than the upper lip (Fig. 2b).

Discussion

All above-mentioned morphological features are typical for *L. ramada* (HARRISON 2003).

Although the ichthyofauna of the Maritsa River in Bulgaria is comparatively well studied (KOVACHEV 1921, CHICHKOFF 1939, MICHAJLOVA 1965, 1970, VELCHEVA & MEHTEROV 2005), there are no data about the presence of *L. ramada* in this river. The captured specimens belong to the first mugilid species found in the Bulgarian stretch of the Maritsa River and also the first record of *L. ramada* in Bulgaria in a locality outside the Black Sea and its estuaries.

It is well known that the thin-lipped mullet displays greater tendency among all the European mugilids to ascend far upstream the rivers (HARRISON 2003). According to BARBIERI et al. (2015), in Greece this is the most frequent mugilid migrant into freshwater, often entering lowland rivers, including Evros (Maritsa) River and migrating at least up to 50 km from the river mouth. Anyway, the locality where we found *L. ramada* is situated approximately at 207 km from the mouth of Maritsa (Evros) River, which makes it the farthest ever detected upstream migration of this species.

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References

- ALEKSANDROVA K. 1961. Distribution et migrations des muges (Mugilidae, Pisces) devant le littoral Bulgare de la Mer Noire. Bulletin de l'Institut Central de Recherches Scientifiques sur la Pisciculture et la Peche – Varna 1: 117-131 (In Bulgarian, French summary).
- BARBIERI R., ZOGARIS S., KALOGIANNI E., STOUMBOUDI M. T., CHATZINIKOLAOU Y., GIAKOUMI S., KAPAKOS Y., KOMMATAS D., KOUTSIKOS N., TACHOS V., VARDAKAS L. & ECONOMOU A. N. 2015. Freshwater Fishes and Lampreys of Greece: An annotated checklist. Monographs on Marine Sciences No. 8. Hellenic Centre for Marine Research, Athens, Greece, 130 p.
- BEN-TUVIA A. 1986. Mugilidae. – In: WHITEHEAD P., BAUCHOT M.-L., HUREAU J.-C., NIELSEN J. & TORTONESE E. (Eds.): Fishes of the North-eastern Atlantic and the Mediterranean 3: 1197-1204.
- CHICHKOFF G. 1912. Contribution à l'étude de la faune de la Mer Noire. *Archives de Zoologie exper. et générale*, 10 (2): 1-39.
- CHICHKOFF G. 1939. [Fish fauna in our rivers entering the Aegean Sea]. *Fisheries Review [Ribarski Pregled]*, 4: 1-3 (In Bulgarian).
- DRENSKY P. 1951. Fishes of Bulgaria. In: Fauna of Bulgaria. Vol. 2. Sofia: Bulgarian Academy of Sciences, 270 p. (In Bulgarian).
- GUEORGUIEV G., ALEXANDROVA K. & NIKOLOFF D. 1960. Observations sur la reproduction des poissons le long du littoral Bulgare de la Mer Noire. Bulletin de l'Institut Zoologique de l'Academie des Sciences de Bulgarie 9: 255-292. (In Bulgarian, French summary).
- HARRISON I. 2003. *Liza ramada* (Risso, 1826). In: P. MILLER (ed.). The Freshwater Fishes of Europe, Vol. 8/I, Mugilidae, Atherinidae, Atherinopsidae, Blenniidae, Odontobutidae, Gobiidae 1: 29-35.
- KARAPETKOVA M. & ŽIVKOV M. 1995. [The fishes of Bulgaria]. Sofia: Gea-Libris, 246 p. (In Bulgarian).
- KAYA M., MALTER S. & KORKUT A. Y. 1998. A new grey mullet species "*Mugil so-iuy* Basilewsky" (Teleostei: Mugilidae) from the Aegean Coast of Turkey. *Turkish Journal of Zool-*

- ogy 22: 303-306.
- KOVACHEV V. 1921. [An attempt for studying the ichthyofauna of the Maritsa River and its tributaries]. Travaux de la Soci t  Bulgare des Sciences Naturelles 9: 90-94 (In Bulgarian).
- MICHAJLOVA L. 1965.  ber die Ichthyofauna Thrakiens. In: PASPALEV G. (Ed.): Die Fauna Thrakiens. 2. Verlag der Bulgarischen Akademie der Wissenschaften, Sofia, 265-288. (In Bulgarian, German summary).
- MICHAJLOVA L. 1970. Ichthyofauna in the rivers of the Aegean Sea catchment area. Priroda 4: 62-65. (In Bulgarian, English summary).
- NECHAEV A. 1933. [Preliminary report on the mugilid survey.] Bulletin of the Experimental Ichthyological Station in Sozopol for 1932 [Trudove na opitnata ihtiologichna stantsiya v grad Sozopol za 1932 g.]: 5-24 (In Bulgarian)
- SIVKOV J. 2000a. The Ichthyofauna in the Coastal Area of the Reserve Kaliakra. Bulletin du Musee National de Varna 30-31 (45-46): 293-297.
- SIVKOV J. 2000b. Morphological characteristics of the thin lip mullet *Liza ramada* (Risso, 1826) (Pisces, Mugilidae) from the Bulgarian Black Sea coast. Bulletin du Musee National de Varna, 30-31 (45-46): 306-309. (In Bulgarian, English summary).
- SIVKOV J. 2003. The Ichthyofauna of the Bay of Varna. Bulletin du Musee National de Varna 34-35 (49-50): 369-376. (In Bulgarian, English summary).
- STARUSHENKO L. I. & KAZANSKY A. B. 1996. Introduction of mullet harder (*Mugil so-iuy* Basilewsky) into the Black Sea and the Sea of Azov. *Stud. Rev. Gen. Fish. Counc. Mediterr.* 67: 1-29.
- STOYANOV S., GUEORGUIEV G., IVANOV L., HRISTOV D., KOLAROV P., ALEXANDROVA K. & KARAPETKOVA M. 1963. [The fishes of Black Sea]. Varna, 246 p. (In Bulgarian).
- SVETOVIDOV A. N. 1964. [The Fishes of the Black Sea]. Moscow-Leningrad: Nauka, 551 p. (In Russian).
- TREWAVAS A. 1973. Mugilidae. In: HUREAU J.-C. & MONOD T. (Eds.): Check-list of the fishes of the north-eastern Atlantic and of the Mediterranean, Vol. 1, pp. 567-574.
- VELCHEVA I. & MEHTEROV N. 2005. A study on the ichthyocenosis diversity in the downstream of the Maritsa River. *Animalia, Scientific Studies – Biology, University of Plovdiv “P. Hilendarski”* 41: 69-78 (In Bulgarian).

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