

Rapid Communication**First record of the Montague's blenny *Coryphoblennius galerita* (L., 1758) (Actinopterygii: Blenniidae) in the mesohaline waters of the North-Western Black Sea, Ukraine**

Sergii Khutornoy and Yuriy Kvach*

Institute of Marine Biology, National Academy of Science of Ukraine, Vul. Pushkinska 37, 65048 Odessa, Ukraine

Author e-mails: kalkan@ukr.net (SK), yuriy.kvach@gmail.com (YK)

*Corresponding author

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OPEN ACCESS**Abstract**

This is the first report of Montague's blenny (*Coryphoblennius galerita* (L., 1758) (Actinopterygii: Blenniidae) from the Gulf of Odessa, Black Sea, Ukraine. Previous records of this species were restricted to the Eastern Crimean and Turkish coasts. Three male fish of approximately the same size, all with spawning coloration, were found in October 2018. The morphology of the found fish was typical for the representatives of this species. However, the crest morphology indicated that the specimens from the Gulf of Odessa were morphologically closer to the Atlantic populations (i.e., a crest covered by small filaments along the entire margin), than to the Mediterranean ones (i.e., a crest with filaments limited to the top margin of the crest). Although the salinity during the sampling period was between 15 and 17‰, this region can experience salinities as low as 5‰. Continued monitoring of this location is needed to confirm that *C. galerita* forms a self-sustaining population in these lower salinity waters.

Key words: Atlantic species, blennies, brackish waters, Gulf of Odessa**Introduction**

The introduction of species native to the adjacent Mediterranean waters into the Black Sea, the so called Mediterraneanization process (Puzanov 1965; Gomoiu 1981; Cvetkov and Marinov 1986), is a part of an ongoing process observed in the Baltic Sea (Leppäkoski 1991) and Black Sea (Miller 1965; Zaitsev 1998; Kvach and Kutsokon 2017). Mediterranean and Boreal-Atlantic fishes that increase their range into the Black Sea are considered as non-indigenous (Boltachev et al. 2009). However, species that expand their ranges within the Black Sea (i.e., from east to west) are not considered as non-indigenous, but rather are indicative of a range expansion (Kvach and Kutsokon 2017).

A total of 10 blenny species (Actinopterygii: Blenniidae) are known in the Black Sea ichthyofauna, mainly distributed near the Turkish coasts (Bilecenoğlu et al. 2014). One of these, an Atlantic blenniid species, is the Montague's blenny (*Coryphoblennius galerita* (L., 1758) which was discovered

near the Turkish and Crimean coasts in the early and mid 1900s (Slastenenko 1934; Svetovidov 1964). The Montague's blenny has a native range from the western British Islands in the north to the Canary Islands in the south, including the Mediterranean basin (Zander 1986; Bath 1990). This is an intertidal fish which inhabits rocky substrates and can remain out of water during low tides and breathe air (Martin and Bridges 1999). The diet of this fish in its native range consists of mainly benthic invertebrates, such as copepods and barnacles, but it also consumes algae (Zander 1986; Froese and Pauly 2019). The fish reproduce between May and August; males spawn with many females and protect the territory (Zander 1986). However, the life history traits of this species in the Black Sea are unknown (Movchan 2011). In last decade, new occurrences were reported from Turkey (Bat et al. 2006). Here we report a new record of *C. galerita* from the North-Western Black Sea, near the Ukrainian coasts.

Materials and methods

Fish communities were sampled in October 2018 from a pier located on Cape Langeron, Gulf of Odessa (46.47503N; 30.76654E). The water depth of the sampling locality was approximately 2–5 m. A 1 × 0.5 m frame dipnet with 5 mm mesh-size, attached to a 2-m stick, was swept through the water column adjacent to the pier by hand at 1 m depth. In total, about 60 m² of the pier wall was sampled. Environmental parameters (i.e., salinity and temperature) for the pier were monitored by the Institute of Marine Biology of the National Academy of Science of Ukraine.

All sampled fish were identified to species and counted. The standard length (SL, cm) was measured in the field, and all identified fish were released alive. Individuals with problematic species identification were transported live to the laboratory and preserved in 4% formalin for further study.

Montague's blenny individuals were sexed, sized (total length, TL, cm, and standard length, SL, cm) and weighed (M, g). Standard deviation (SD) was calculated for mean parameters. Frequency was calculated as the number of individual fish per square meter (F, ind. × m⁻²). The numbers of fin rays were counted in dorsal (D), anal (A), ventral (V) and pectoral paired fins (P). In D, spines and soft rays were counted separately. After the study, the Montague's blennies were deposited in the National Natural History Museum of the NAS of Ukraine, Kyiv, ichthyological collection, as voucher specimens (No 10386).

All fish scientific names were used in accordance with FishBase (Froese and Pauly 2019).

Results

In total, 26 individual fish ascribed to 7 species were recorded (Table 1). This included a syngnathid, black-striped pipefish (*Syngnathus abaster* Risso,

Table 1. Total (n) and relative number (N, %), standard length (SL \pm SD, mm) and frequency (F, ind. \times m⁻²) of fish sampled from the fouling community of a pier at Cape Langeron, Gulf of Odessa.

Species	n	N	SL	F
<i>Syngnathus abaster</i>	1	3.1	11	0.02
<i>Aidablennius sphinx</i>	10	31.3	49.6 \pm 6.4	0.17
<i>Coryphoblennius galerita</i>	3	9.4	60.0 \pm 5.0	0.05
<i>Parablennius tentacularis</i>	6	18.8	49.3 \pm 0.4	0.1
<i>Parablennius zvonimiri</i>	1	3.1	48	0.02
<i>Ponticola cephalargoides</i>	4	12.5	58.3 \pm 14.7	0.07
<i>Ponticola ratan</i>	1	3.1	50	0.02

Table 2. Size, weight and meristic parameters of the sampled Montague's blennies (*Coryphoblennius galerita*) from the Gulf of Odessa. No – number of examined fish; SL – standard length, mm; TL – total length, mm; M – weight, g; D – number of fin rays in dorsal fin; A – number of fin rays in anal fin; V – number of fin rays in ventral fin; P – number of fin rays in pectoral paired fins.

No	SL	TL	M	D, Spines/soft rays	A	V	P
1	65	78	6.245	XII/17	18	2	12
2	60	70	4.080	XII/17	18	2	12
3	55	64	2.645	XIII/17	19	2	12



Figure 1. Total view of a male Montague's blenny caught in the Gulf of Odessa (in aquarium). Photo by Yuriy Kvach.

1827), four blenniids – sphinx blenny (*Aidablennius sphinx* (Valenciennes, 1836)), Montague's blenny (*Coryphoblennius galerita* (Linnaeus, 1758)), tentacled blenny (*Parablennius tentacularis* (Brünnich, 1768)) and Zvonimir's blenny (*Parablennius zvonimiri* (Kolombatovic, 1892)), two gobiids – Pinchuk's goby (*Ponticola cephalargoides* (Pinchuk, 1976)) and ratan goby (*Ponticola ratan* (Nordmann, 1840)). The sphinx blenny was the most numerous and frequently encountered (Table 1). Only one individual each of the black-striped pipefish, Zvonimir's blenny and ratan goby was present. The Montague's blenny comprised 9.4% of the total fish assemblage, with a frequency of 0.05 ind.m⁻².

All three Montague's blennies were males of approximately the same size (Table 2; Figure 1), exhibiting morphology typical of the species. A large fleshy triangular crest, decorated with a row of small filaments extending along the margin, was apparent on the top of the head (Figure 2). The colour of the fish body was usually from completely dark to marbled with tiny



Figure 2. Front view of a male Montague's blenny from the Gulf of Odessa in aquarium (A) and a drawing of the crest with details of the filaments (B). Photo by Yuriy Kvach.

bluish-white spots (Figure 1). The posterior extremities of upper lips were white and enlarged. The number of dorsal spines was fewer ($n = 12\text{--}13$) than that of soft rays ($n = 17$).

The water salinity in the sampling site ranged between 15 and 17‰ during October 2018.

Discussion

This is the first record of the Montague's blenny in the Gulf of Odessa, Black Sea, Ukraine, and from the transitional waters of the North-Western Black Sea in general. This region experiences a wide range of salinities, from 5–10‰ in winter to 15–18‰ in summer (Zaitsev 1992; Garkavaya et al. 2000), which is atypical of the habitat of Atlantic fish such as Montague's blenny. In most of its native range, the Montague's blenny inhabits euhaline waters (30–35‰) (Zander 1986; Bath 1990). Previously in the Black Sea, the Montague's blenny had been found near the Turkish, Bulgarian, Crimean and Caucasian coasts, all of which have polyhaline waters (Rass 1987; Bat et al. 2006; Karapetkova and Zhivkov 2010; Yankova et al. 2014). In the Ukraine it was found near the South-Eastern Crimean coasts where the salinity is consistently $\sim 18\text{‰}$ (Slastenenko 1934; Svetovidov 1964; Rass 1987; Bat et al. 2006). However, it must be noted that this report only encompasses a single sampling period (October 2018), and it is possible that recurrent sampling will not discover individuals, especially after a long period of reduced salinities.

The Montague's blenny was found as a component of the typical fish fouling assemblage inhabiting rocky substrates (Zander 1986; Movchan 2011; Vinogradov et al. 2017). Its abundance and frequency is in the same range as other fish in the habitat (i.e., it did not dominate the samples in

terms of abundance or density). Along the Atlantic coast of Europe, this fish is a common inhabitant of the intertidal zone (Martin and Bridges 1999). All males collected in October had spawning coloration (dark color of the body, white lips; see Figure 1). However, the reported reproduction period of this species in its native range is between May and August (Zander 1986). The appearance of spawning colors late in the season may indicate relatively good conditions for reproduction in the Gulf of Odessa.

The meristic parameters of the fish sampled here were in agreement with previous records (Svetovidov 1964; Zander 1986; Movchan 2011). However, the total length of all three individuals (see Table 2) was close to the maximum known for this species (74–80 mm; Svetovidov 1964; Zander 1986). The attainment of large body size could also indicate favourable conditions for this species in the Gulf of Odessa. The crest morphology (see Figure 1) indicated that the individuals from the Gulf of Odessa were morphologically closer to Atlantic populations than to Mediterranean ones (Domingues et al. 2007). The crest was covered by small filaments along its entire margin, similar to individuals from the Azor coasts, while Mediterranean specimens have filaments mainly on the top of the crest. However, further genetic testing of these specimens from the Gulf of Odessa is needed to validate site or region of origin.

This is the sixth blenny species reported from the Ukrainian near-shores of the North-Western Black Sea and the fifth found in the Gulf of Odessa. The Montague's blenny is the third introduced blenniid species in the Black Sea, after the sphinx blenny (*A. sphynx*) and the Zvonimir's blenny (*P. zvonimiri*), that has expanded its range into the Gulf of Odessa and adjacent mesohaline waters about 20 years ago (Khutornoy 1998). Previously, the rusty blenny (*Parablennius sanguinolentus* (Pallas, 1814)) and tentacled blenny (*Parablennius tentacularis* (Brünnich, 1768)) were commonly observed throughout the North-Western Black Sea (Vinogradov and Khutornoy 2013; Vinogradov et al. 2017), and the peacock blenny (*Salaria pavo* (Risso, 1810)) occurred in the Snake Island coastal waters only (Snigirov et al. 2012; Vinogradov and Khutornoy 2013; Vinogradov et al. 2017). All of these species were common everywhere in the Black Sea. Another species, the Mystery blenny (*Parablennius incognitus* (Bath, 1968)), known from Crimean, Caucasian and Turkish coastal waters, is likely to spread throughout the Black Sea (Boltachev et al. 2009; Keskin 2010; Bilecenoglu et al. 2014; Yankova et al. 2014), but has not yet been found in the brackish waters of the North-Western Black Sea.

In addition to blennies, several other Atlantic and Mediterranean fishes have been recorded in the transitional waters of the North-Western Black Sea for the first time over the last two decades, e.g. chestnut goby (*Chromogobius quadrivittatus* (Steindachner, 1863)), Salema porgy (*Sarpa salpa* (L., 1758)) and gilt-head bream (*Sparus aurata* L., 1758) (Boltachev et al. 2009; Vinogradov and Khutornoy 2013). All of these species, as well as

the Montague's blenny, are marine species of Atlantic origin. Their presence in transitional waters and estuaries is normally impossible or, at least rare and untypical. The possible vector of the blenny introduction is natural range expansion, which observed for several Atlantic and Mediterranean fish species in the Black Sea in last decades. Among the possible sources is a population from the Bulgarian near-shores (Karapetkova and Zhivkov 2010), which is closest to the North-Western Black Sea. Continued monitoring of this location is needed to confirm that *C. galerita* forms a self-sustaining population in the mesohaline waters of the North-Western Black Sea. The finding of the typical marine species, Montague's blenny, in the mesohaline water region of the Black Sea, confirms the high tolerance of this fish to low salinity. Therefore, the further laboratory testing of salinity tolerance of this fish species is needed.

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