First record of dogtooth grouper *Epinephelus caninus* (Valenciennes, 1834), Perciformes, Serranidae, in the Black Sea

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Abstract

A single specimen of dogtooth grouper *Epinephelus caninus* Valenciennes, 1834 (Perciformes, Serranidae) was captured along the southwest Crimean Peninsula, in the Black Sea. It was captured by using a trap-net at a depth 40 m, on 26 April 2013. This is the first record of *Epinephelus* genus in the Black Sea.

Key words: *Epinephelus caninus*; dogtooth grouper; Black Sea; Crimean Peninsula

Introduction

The family of Serranidae is quite diverse and includes 3 subfamilies, 64 genera and 475 species (Nelson 2006). It is widely distributed in the tropical and subtropical waters of 3 oceans. The genus *Epinephelus* is itself very diverse and includes 98 species, of which 9 inhabit the Eastern Atlantic Ocean and the Mediterranean Sea (Heemstra and Randall 1993). To date Serranidae were strictly represented by three species of the *Serranus* genus in the Black Sea. The most common being the painted comber *Serranus scriba* (Linnaeus, 1758), which is found on all marine shores of the Black Sea (Vasil’eva 2007; Boltachev and Karpova 2012). *Serranus cabrilla* (Linnaeus, 1758) known commonly as the comber, is found infrequently near Turkish, Bulgarian and Romanian shores. The third species, the brown comber *Serranus hepatus* (Linnaeus, 1758), which is native of the Mediterranean Sea and Eastern Atlantic ocean from Portugal to Senegal, was observed only once, after the capture of a single individual in March 2012 in the region of the Şile coast, approx. 38 km east of Bosphorus (Dalgiç et al. 2013).

In this study the first record of the dogtooth grouper *Epinephelus caninus* (Valenciennes, 1834) in the Black Sea is reported. *E. caninus* is a subtropical species distributed widely in the Eastern Atlantic Ocean from Portugal to Angola and in the Mediterranean Sea (Heemstra and Randall 1993). To date there is no published evidence of the occurrence of this species in the Black Sea.

Methods

A single specimen was caught using a trap net on 26 April 2013, in the southwest Crimean coastal waters, near Cape Ay-ya (2.7 km east of the Balaclava Bay, Grid reference: 44°28,8’ N, 33°37,4’ E), at a depth of 40 m. The live specimen was brought to Sevastopol public aquarium, where it was identified using the basic manual of Heemstra and Randall (1993) and supported by additional identification keys to marine fishes by Fischer et al. (1981) and Whitehead et al. (1986). The specimen has been kept alive and is currently used for demonstration purposes (Figure 1).
Figure 1. Dogtooth grouper *Epinephelus caninus* (Valenciennes, 1834) caught near the southwest coastal zone of Crimea in the Black Sea. Photograph by E. Karpova.

Figure 2. Spines and dark bands on the head of the dogtooth grouper *Epinephelus caninus* (Valenciennes, 1834). Photograph by E. Karpova.

Results and discussion

The collected specimen was measured and identified as a dogtooth grouper *Epinephelus caninus* (Valenciennes, 1834) (Figure 1). Total length (TL) was 410 mm with a standard length (SL) of 360 mm. The dorsal fin had 11 spines and 13 soft rays. Membranes are deeply incised between spines. The anal fin had 3 spiny rays and 8 soft rays. The third spine of the dorsal fin was the largest one. Soft rays of the dorsal fin are quite high, which is characteristic for young specimens of groupers; the length of the tallest soft ray was equal to the length of the third spiny ray. Pectoral fins were rounded, symmetrical and had 18 more rays than the ventral fins. Pectoral fin length was two times the head length. The head length was 2.5 times the standard body length. Ventral rays were quite short, ending far from the anus. The caudal fin was truncate with edges slightly rounded. In the lower preopercle, there were 4 notable, densely packed spines, while in the back part of operculum, there were three spines, which were separated (Figure 2). The back edge of the operculum was sharpened. Two small, ventrally orientated spines were present in front of the eye. Scales were of average size.

The fish was evenly dark in color when in a calm state. Three clusters of large white spots occurred along the upper half of the body, near the base of dorsal fin (behind the back of the head) (Figures 1 and 2). A further small cluster of white spots was situated near the end of the soft rays of the dorsal fin. There also were white spots of average size below the lateral line. They registered seldom white points lower the lateral line. There were white spots on the dorsal fin spines, developed directly above clusters on the upper part of the body that are mentioned above. There was a wide white band along the edge of the dorsal fin spines. Several small white spots also existed in the lower part of the soft rays of the dorsal fin. Other fins were evenly-colored and dark. There was a thin, weakly expressed white rim along the edge of the soft part of the dorsal and anal fins (more pronounced on the caudal fin).

Fish color weakened considerably under stress, and acquired a motley camouflage with the
Dogtooth grouper *Epinephelus* in the Black Sea

domination of grey colors of different intensity. Under weak light the body color had dark tints from black, dark-brown to dark-grey, with separate white spots in the upper half of the body. There were three dark bands on the head, characteristic for young fish of standard length less than 450 mm for this species (Whitehead et al. 1986; Heemstra and Randall 1993). The upper band was the widest and began near the posterior edge of eye, went through the spines in the preopercle and ended near the lower rear edge of the operculum. The second band commenced from the middle of the lower edge of the eye and continued through to about the end of the lower part of the preopercle, before the spines. The third band was situated above the upper jaw. Both upper bands were orientated at about 45° ventrally.

Dogtooth grouper can reach a standard length (SL) of 1500 mm, but generally they grow up to 1000 mm, with a total length of 1570 – 1640 mms; maximum body mass is up to 78 kg (Fischer et al. 1981; Whitehead et al. 1986; Heemstra and Randall 1993). Life span can be up to 75 years (IUCN Red List 2012).

The dogtooth grouper is an eastern Atlantic species that is distributed from Portugal to Angola, including the Mediterranean and the Canary Islands (Spain). It has not been previously found in the Marmara, Black or Azov seas (Whitehead et al. 1986; Heemstra and Randall 1993). The geographic position of the Crimean peninsula is an important factor in relation to the apparent invisibility of this area. The most southern point of the Crimean Peninsula, Cape Sarych, lies only 258 km from the Anatolian peninsula of Turkey where a surface longitudinal current, going northwards from Turkey to Crimea exists. This current declines near Foros, and follows along the southwest and west coast of Crimea (Zenkevich 1963). It is possible that Mediterranean species are carried with this current and move into the southwest and western coast of the Crimean peninsula. Such species as the yellow-headed goby *Gobius xanthocephalus* (Heymer and Zander, 1992) and Bath’s goby *Pomatoschistus bathi* (Miller, 1982) were both found near the Tarkhankut peninsula, which several years ago were only registered near the more southern Sevastopol shores.

The potential of a substantial established population of dogtooth grouper in the Black Sea may have its challenges due to low salinity, averaging 18 with low winter temperatures, and dropping to 7 near the southwest Crimean coast. However, some other recent Eastern Atlantic or Mediterranean species, such as salema porgy *Sarpa salpa* (Linnaeus, 1758) and gilthead seabream *Sparus aurata* (Linnaeus, 1758), were first reported near Balaklava in 1999, and are now regularly recorded and most likely established along the coast of southwest Crimea (Appendix 1). This process of Mediterraneanization of the species into the northernmost part of the Black Sea is not known. Introduction via ballast water or as an aquarium release is unlikely. The presence of this fish is probably due to a gradual extension of its range, reaching the Black Sea from the Mediterranean, through the straits of Dardanelles and Bosphorus. Long-distance migrations are, however, not normal behaviour for this species (Whitehead et al. 1986; Heemstra and Randall 1993).

From 1999 to 2012, fourteen new species were recorded along the southwest Crimean coast. Six species are new for the Black Sea in principle and nine species are new for the Crimean peninsula coastal zone. Out of these species, 12 species have primarily Mediterranean origin; three others are exotic species: Indian – Pacific red barracuda *Sphyraena pinguis* (Günther, 1874) (identified according Doiuchi and Nakabo 2005), pennant coralfish *Heniochus acuminatus* (Linnaeus, 1758) and north-western Pacific chameleon goby *Tridentiger trigonocephalus* Gill, 1859 (Boltachev and Yurakhno 2002; Boltachev 2009; Boltachev et al. 2009; Boltachev and Karpova 2012) (see also checklist in Appendix 1).

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Black Sea (Boltachev and Yurakhno 2002; Boltachev et al. 2009) shows some interesting parallelisms with the northward expansion of southern Mediterranean fishes (Azzurro et al. 2012).

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Supplementary material

The following supplementary material is available for this article:

Dagtouth grouper *Epinephelus* in the Black Sea

**Appendix 1.** List of new fish species reported for coastal waters of south-western Crimea during 1998 – 2013.

<table>
<thead>
<tr>
<th>Species name</th>
<th>Date of first record</th>
<th>Location Name</th>
<th>Coordinates</th>
<th>Reference/Collector</th>
<th>Origin, Status (Pathway)</th>
<th>Modern occurrence in the coastal zone of the Crimea</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Sphyraena pinguis</em> Günther, 1874, red barracuda</td>
<td>20.08.1999</td>
<td>Balaclava bay</td>
<td>44°29.7’ N, 33°35.6’ E</td>
<td>Boltachev 2009</td>
<td>Indian ocean, western Pacific; lessepsian migrants: eastern Mediterranean, Aegean Sea. Exotic (Canals)</td>
<td>Single record</td>
</tr>
<tr>
<td><em>Sarpa salpa</em> (Linnaeus, 1758), bamboo fish, salema</td>
<td>20.09.1999</td>
<td>Balaclava bay</td>
<td>44°29.7’ N, 33°35.6’ E</td>
<td>Boltachev and Yurakhno 2002</td>
<td>Mediterranean, Atlantic, southern Black Sea. Rare. Range extending</td>
<td>Established</td>
</tr>
<tr>
<td><em>Sparus aurata</em> Linnaeus, 1758, gilthead seabream</td>
<td>04.08.1999</td>
<td>Balaclava bay</td>
<td>44°29.7’ N, 33°35.6’ E</td>
<td>Boltachev and Yurakhno 2002</td>
<td>Mediterranean, eastern Atlantic, southern Black Sea. Rare. Range extending</td>
<td>Likely established</td>
</tr>
<tr>
<td><em>Chelon labrosus</em> (Risso, 1827), thicklip grey mullet</td>
<td>04.08.1999</td>
<td>Balaclava bay</td>
<td>44°29.7’ N, 33°35.6’ E</td>
<td>Boltachev and Yurakhno 2002</td>
<td>Mediterranean, eastern Atlantic, southern Black Sea. Rare. Range extending</td>
<td>Migrants, registered in the warm season not every year</td>
</tr>
<tr>
<td><em>Gobius xanthocephalus</em> Heymer et Zander, 1992, yellow headed goby</td>
<td>12.06.2007</td>
<td>Kazach’ya bay</td>
<td>44°35.3’ N, 33°24.5’ E</td>
<td>Boltachev et al. 2009</td>
<td>Mediterranean, eastern Atlantic, Black sea (Caucasus, single record). Range extending</td>
<td>Established</td>
</tr>
<tr>
<td><em>Gobius cruentatus</em> Gmelin, 1789, red mouthed goby</td>
<td>06.05.2002</td>
<td>Martynova bay</td>
<td>44°36.9’ N, 33°30.1’ E</td>
<td>Boltachev et al. 2009</td>
<td>Mediterranean, eastern Atlantic, Black sea (Turkish, single record). Range extending</td>
<td>Established</td>
</tr>
<tr>
<td><em>Heniochus acuminatus</em> (Linnaeus, 1758), pennant coralfish</td>
<td>27.10.2003</td>
<td>Balaclava bay</td>
<td>44°29.7’ N, 33°35.6’ E</td>
<td>Boltachev et al. 2009</td>
<td>Indian ocean, western Pacific. Exotic (shipping)</td>
<td>Single record</td>
</tr>
<tr>
<td><em>Millerigobius macrocephalus</em> (Kolombatovic, 1891), Miller’s goby</td>
<td>25.04.2009</td>
<td>Sevastopol bay</td>
<td>44°37.0’ N, 33°31.4’ E</td>
<td>Boltachev and Karpova 2012</td>
<td>Northern Mediterranean, Aegean sea. Range extending</td>
<td>Established</td>
</tr>
</tbody>
</table>