
A New Maximum Length for the Forkbeard, *Phycis phycis* (Linnaeus, 1766) in the Mediterranean Sea

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Abstract

A specimen of the forkbeard, *Phycis phycis* (Linnaeus, 1766), with 71.0 cm total length (TL) and 4600.0 g total weight (TW), was caught on 21 May 2013 at Karaburun (Izmir Bay, Aegean Sea). Its total length and weight were the maximum observed values for the species.

Keywords: Aegean Sea, maximum length and weight, *Phycis phycis*, forkbeard

INTRODUCTION

Maximum length is important theoretical parameter in fisheries science. Directly and indirectly, this measurement enters into most of the models used in stock assessments. The maximum observed length is a use tool for a rapid evaluation of growth rates in the absence of basic data. Therefore, updating information about the maximum size of a species that might be commercially or recreationally exploited in the future is important (Filiz, 2011).

The forkbeard, *Phycis phycis* (Linnaeus, 1766) (Actinopterygii, Gadiformes, Phycidae), is an Atlanto-Mediterranean, a bottom dwelling species mainly in rocky habitat but found on soft substrate (Golani et al., 2006). Its habitat extends from the 13 m depth down to 650 m (Golani et al., 2006; Froese and Pauly, 2014), but more common in depths between 100 and 200 m (Froese and Pauly, 2014).

Forkbeard is distributed in Turkish coasts of Aegean (Öğretmen et al., 2005; Karakulak et al., 2006; Akyol et al., 2011; Filiz et al., 2013) and Mediterranean Sea (Fricke et al., 2007). It's also recorded from Köycegiz Lagoon/Dalyan River system by Akin et al. (2005). Although forkbeard reported as very rare and little-known fish for Izmir Bay (Akyol et al., 2011), it is mainly caught in the Aegean Sea by bottom trawls, gill and trammel nets, longline and sometimes spearfishing as a target species. Very little is known about the species biology and ecology. Due to target species in various fisheries, habitat loss and pollution, the forkbeard population has been evaluated as "Least Concern (LC)" in the Mediterranean (Abdul Malak et al., 2011) and "Vulnerable (VU)" in Turkey (Fricke et al., 2007), thus making any biological data that we could possess like maximum length and weight of great importance.

MATERIALS AND METHODS

On 21 May 2013, one specimen of *P. phycis* was captured by spearfishing in a marine cave at 12 m depth at Karaburun (Izmir Bay, Aegean Sea). The sea temperature was 21 C°. The specimen (Figure 1) total length was measured to the nearest centimeter and weighed to the nearest gram. The scientific name of the species was also checked against FishBase (Froese and Pauly, 2014).

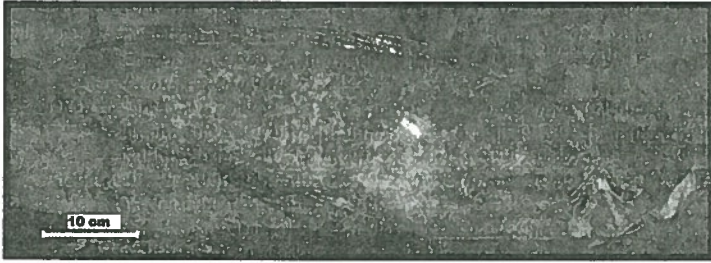


Figure 1. General view of *Phycis phycis*, 71.0 cm TL and 4600.0 g, captured at Karaburun (Izmir Bay, Aegean Sea)

RESULTS AND DISCUSSION

The forkbeard was of 71.0 cm TL and weighed 4600.0 g (Table 1). Although previous maximum length and weight were reported as 65.0 cm TL and 3900.0 g (Froese and Pauly, 2013), there are various studies providing information about maximum lengths (and also maximum weight) of the species both in Mediterranean and Atlantic. These studies give us a chance to make a comparison (Table 1). As it is seen, our specimen proves that this species can grow above the previous maximum data found. If we consider that most of the studies are made in fisheries areas, fisheries pressure can lead to these smaller maximum lengths. As well known, individuals in populations exposed to high levels fisheries mortality/pressure will respond by reproducing at smaller average sizes and ages (Helfman et al., 2009) and thus reached maximum lengths may getting and getting smaller. In Turkey, forkbeard has commercial value and is one of the target species of the small-and large-scale fishery.

Also, predation on the forkbeard may another reason these smaller lengths. *Conger conger* (Morato et al., 1998) and *Galeorhinus galeus* (Morato et al., 2003) documented as predator of forkbeard, where fisheries activities intensive in deeper waters. Contrarily to “bigger-deeper” phenomenon (Polloni et al., 1979) and Mediterranean nanism (Zenetos et al., 2002), our shallower specimen may reached the maximum length and weight observed both since the area may not an intensive fisheries zone or no predator of forkbeard this shallow waters. So, an individual that faced no high fisheries pressure or predation may be reached that kind of length and weight. On the other hand, any factor that might possibly influence growth has been shown to have an effect, including temperature, food availability, nutrient availability, light regime, oxygen, salinity, pollutants, current speed, predator density, intra-specific social interactions and genetics (Helfman et al., 2009). These factors, often working in combination, create large variations in size of fishes of the same and different ages (Helfman et al., 2009), which were not accounted for in the present case.

Since the forkbeard population has been evaluated as “Least Concern (LC)” in the Mediterranean Regional Red List (Abdul Malak et al., 2011) and “Vulnerable (VU)” in Turkey (Fricke et al., 2007), thus making any biological data that we could possess like maximum length and weight of great importance. Our specimen (71.0 cm TL and weighed 4600.0 g) proves that this species can grow above the previous maximum data unless it faced both fisheries and predator pressure.

Table 1. Comparison of the maximum total lengths

References	A ¹	B ²	n	Length range (cm)	Weight range (g)	Locality
Morato et al. (1998)	LL	50-150	23	24.0-64.0	-	Azores (Atlantic)
Duicic & Krajevic (1996)	LL	-	58	26.2-56.4	-	Croatian water (Adriatic)
Morato et al. (1999)	LL	-	356	24.0-64.0	-	Azores (Atlantic)
Uiblein et al. (1999)	BT, BTr	295-330	37	19.0-49.0	-	Great Meteor Seamount (Atlantic)
Morey et al. (2003)	TN, BTr, LL, SF	-	96	410.6-8.4	9.4-1650.0	Balearic Islands and the eastern coast of the Iberian Peninsula (western Mediterranean)
Mendes et al. (2004)	GN, TN	30-350	45	17.2-50.5	54.0-1600.0	western coast of Portugal (Atlantic)
Ögretmen et al. (2005)	Various nets	-	1	23.7	-	Gökova Bay (S Aegean Sea)
Karakulak et al. (2006)	GN, TN	<30	59	13.7-44.5	-	Gökçeada Island (N Aegean Sea)
Akyol et al. (2011)	TN	50	1	27.0*	-	Izmir Bay (Central Aegean Sea)
Filiz et al. (2013)	BTr	0-600	11	6.7-11.4	2.7-14.7	S. Aegean Sea
This study	SF	12	1	71.0	4600.0	Karaburun (Aegean Sea)

A1: Sampling Method (LL: Longline, BT: Bottom trap, BTr: Bottom trawl, TN: Trammel net, GN: Gill net, SF: Spearfishing)

B2: Depths where P. phycis found (m)

*: indicates standard length (SL)

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