



Threatened brill species in marine waters of Turkey: *Scophthalmus rhombus* (Linnaeus, 1758) (Scophthalmidae)

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Abstract

Scophthalmus rhombus is rarely occurred and restricted to marine and estuarine sites in the eastern Marmara Sea and western Black Sea coast of Turkey. *S. rhombus* is occasionally caught in low numbers and continuously decreased in abundance due to overfishing and habitat degradations. This species should be considered to be threatened for Turkish marine waters. This species might also be recorded in the IUCN Red List of Threatened Species as Near Threatened (NT).

Keywords:

Scophthalmus rhombus, Threatened species, Marmara Sea, Western Black Sea, Turkey.

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Introduction

Brill *Scophthalmus rhombus* (Linnaeus, 1758) is a flatfish species belong to the family of Scophthalmidae. There are two more species of the genus *Scophthalmus* as *Scophthalmus maximus* and *Scophthalmus maeticus* for European fisheries and aquaculture. These three species are closely related congeneric species (Pardo *et al.*, 2005; Azevedo *et al.*, 2008; Turan, 2007) which show a similar distributional range (Blanquer *et al.*, 1992; Pardo *et al.*, 2001). *S. rhombus* is a commercial species and distributed on the parts of the Mediterranean Sea and Black Sea to the northeast Atlantic. To date, little is known about the biology of *S. rhombus* and there have been scarce published literature such as length-weight (Dulcic and Glamuzina, 2006), age (Robert and Vianet, 1988; Arneri *et al.*, 2001) and reproductive biology (Caputo *et al.*, 2001) data conducted from the Atlantic and to Adriatic.

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In the past literatures, *S. rhombus* was occurred mainly in marine and estuarine sites in the Turkish part of Black Sea, Marmara Sea and Aegean Sea (Erazi, 1942; Nielsen, 1986; Akşiray, 1987; Fischer *et al.*, 1987; Torcu and Aka, 2000; Fricke *et al.*, 2007). Up to date, little is known about the biology of *S. rhombus* in the Sea of Marmara and Black Sea coast of Turkey (Samsun *et al.*, 2001). According to the field studies (TÜBİTAK 112O920) and personal communications with fishermen and scientists, *S. rhombus* populations were severely declined and rarely found in the Black Sea and Marmara Sea. The primary threats are overfishing, habitat degradation and pollution. The species is now occasionally caught in low numbers and continuously decreasing in abundance. This species should be considered to be threatened in the Black Sea and Marmara Sea in Turkey. Moreover, this species might be recorded in the IUCN Red List of Threatened Species as Near Threatened (NT).

Common names

Brill (English), Çivisiz Kalkan (Turkish)

Conservation status

Least concern (Golani *et al.*, 2011), *S. rhombus* should be considered to be threatened for the Turkish Black Sea Coast and Marmara Sea.

Identification

Scophthalmus rhombus have slender bodies, skin with small, smooth scales, without bony tubercle, brown covered with lighter and darker coloured flecks, excluding the tailfin; the underside of the fish is usually cream coloured or pinkish white (Figure 1). Like other flatfish the brill has the ability to match its colour to the surroundings (Muus and Nielsen, 1999). Part of the dorsal fin of the fish is not connected to the fin membrane, which gives the fish a frilly appearance. Dorsal fin is 72-85, Pectoral fin is 11-12, Anal fin is 53-65, Pelvic fin is 6 (Slastenenko, 1956; Nielsen, 1986). *S. rhombus* is on average between 30 cm and maximum 75 cm in length and up to 8 kg in weight (Muus and Nielsen, 1999).



Figure 1. *Scophthalmus rhombus* collected from the Marmara Sea (photo by Cemal Turan).

Distribution

S. rhombus occurs in the east and central Atlantic, Adriatic Sea, Mediterranean and Black Sea (Bauchot, 1987). It is also known from Iceland (Jonsson, 1992). In the Mediterranean Sea, it is reported in the Gulf of Lion (Arneri *et al.*, 2001; Pranovi *et al.*, 2001; Dulcic and Glamuzina 2006; Letourneur *et al.*, 2001; Dumay *et al.*, 2004). In the Turkish coast, *S. rhombus* is occasionally found in the west Black Sea and Marmara Sea. *S. rhombus* were reported from the east Levant basin (Egypt, Israel, Lebanon, Syria and Mediterranean Sea coast of Turkey) by Golani (1996) that are possibly erroneous.

Abundance

Although no precise data on population trends are available in literatures, with the field studies for turbot species (TÜBİTAK 112O920) based on about three years observation and personal communications with fishermen and scientists this species is locally rare occurred mainly in marine and estuarine sites in the Turkish western part of Black Sea and Marmara Sea. The species is occasionally caught in low numbers on Gölcük coast in the Marmara Sea and Akçakoca in the west part of the Black Sea.

Habitat and ecology

S. rhombus has a demersal lifestyle living on sandy and muddy bottoms, ranging in depth from 5 to 50 m in shallow water (Muus and Dahlstrøm, 1989; Riede, 2004; Franco *et al.*, 2006). It is also found in lagoons. It is carnivorous with a rather narrow prey-spectrum; juveniles feed on molluscs and crustaceans, and adults mainly on other bottom-living fish (such as sandeels and gobies) and cephalopods, and to a lesser extent on crustaceans and bivalves (Holmes and Gibson, 1983; Besyst *et al.*, 1999; Froese and Pauly, 2015).

Reproduction

Movement on the nursery grounds seems to be associated with tidal cycles and foraging activity. An increase in the offshore migration distance is observed in adults of *S. rhombus*, likely associated with spawning behaviour. Spawning is sequential, every 2 to 4 days, and the spawning season occurs between April and June in the Mediterranean region and between May and August in the Atlantic region. Females reach maturity at 3 years of age and males at 2 years (at a length of about 46 cm and 30 cm, respectively). Maximum reported age is 6 years (Robert and Vianet, 1988). Each spawning season more than 5 million eggs are produced. The eggs are pelagic and demersal in the Atlantic, Mediterranean and Black Sea (Muus and Nielsen, 1999).

Threats

S. rhombus is a commercial species and caught with beach seines, trammel nets, longlines and trawls in Turkish coasts. Serious shifts have occurred in the Black Sea ecosystem in the last 25 years (Turan *et al.*, 2010). The ecosystem was also affected by bottom trawling, which destroys the seabed communities and affects the links between the benthic and pelagic components of the system. Therefore, over-fishing pressure, pollution and excessive harvesting of brill populations in these regions result in further declines in the occurrence of brill. Thus, monitoring studies and conservation policies must be developed and restorations of the habitats of this species must be achieved immediately.

Conservation action

No current conservation action has been implemented (IUCN, 2015).

Conservation recommendations

More information on biology and ecology of *S. rhombus* is required. Moreover, a detailed knowledge on current population status is needed, and conservation measures for the protection of the local population are strongly suggested. Genetic analysis should also be conducted to determine its genetic structure as defined for other marine species (Turan, 2006; Turan, 2008). This species should be protected along the Turkish Black Sea and Marmara Sea. In addition, this species might be recorded in the IUCN Red List of Threatened Species as Near Threatened (NT).

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