

## **Some remarks on the catches of anchovy, *Engraulis encrasicolus* (Linnaeus, 1758), in Georgian waters by Turkish fleet between 2003 and 2009**

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### **Abstract**

The Turkish anchovy catch in the Georgian waters between 2003 and 2009 was estimated as 60,968 tons. Total quota for pelagic fish was declared as 60,000 tons by the Georgian authorities in 2007. Although the anchovy fishing in the Georgian Black Sea by the Turkish fleet started in 1996, there is no information on anchovy fisheries which were made according to the bilateral agreement between Turkish and Georgian companies. In the Black Sea, there are several shared stocks occurring within the exclusive economic zones of the two or more coastal states. These resources need to be sustainable, managed by riparian countries with regional cooperation. An urgent anchovy stock assessment study is needed in order to manage Georgian fisheries in a sustainable manner. It is recommended that fishing in the Abkhazia region also needs to be managed in order to respect sovereignty of the coastal states and international law.

**Key words:** Anchovy, Catch, Georgia, Black Sea

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### **Introduction**

*Engraulis encrasicolus* (Linnaeus, 1758) is a pelagic and thermophilic marine fish. It forms large schools in the coastal water along the European and African coasts in the eastern Atlantic Ocean and in the

Mediterranean, Black and Azov Seas. The fish tends to move further north and into surface waters in summer, retreating and descending in winter. It can tolerate salinities of 5-41 ppm and in some areas, enters lagoons, estuaries and lakes, especially during spawning (Froese and Pauly 2011). The spawning takes place in summer in the warm upper layer (16-28°C). Reproduction occurs mostly in low saline (7-18‰) coastal waters, especially in estuarine areas. The embryonic period lasts for about 24 hours (at 22.0-23.4°C) and the pelagic eggs are elliptical (long axis: 1.5-1.9 mm; short axis: 0.8-1.2 mm) (Lisovenko and Andrianov 1996).

The anchovy is the most abundant species in the Black Sea supporting commercial fishery and it has a significant role in the Black Sea ecosystem for energy transfer to higher trophic level. It is also important as a consumer of zooplankton and a competitor of other planktivores in the system (Daskalov *et al.* 2007). Two anchovy subspecies exist in the Black Sea: the Azov anchovy, *Engraulis encrasicolus maeoticus* Pusanov and the Black Sea anchovy, *Engraulis encrasicolus ponticus* Alexandrov. The Black Sea anchovy is more abundant and important for commercial fishery. Recently, the Black Sea anchovy has been considered one of the populations of the European anchovy by some authors, while others consider it a distinct subspecies (Prodanov *et al.* 1997)

The Azov anchovy spawns and feeds in the Azov Sea from May to August. It migrates through the Kerch Strait to the Black Sea in September-October with cold waters of autumn, and hibernates along the northern Caucasian (Novorossiik-Sochy) and southern coast of the Crimea Peninsula. Sometimes, the shoals reach to the Turkish coast (Bingel and Gücü 2010). Spring migration of the Azov anchovy start in mid-April through the Kerch Strait and is over by the end of May (Chashchin 1996 and references there in).

The Black Sea anchovy covers nearly all over the sea during summer. It migrates to warmest waters in the southern Black Sea from October to March (Ivanov and Beverton 1985). The migration route usually

takes place along the Romanian and Bulgarian coastlines and followed by the approach of the wintering schools to Turkish Anatolian and Georgia. The Black Sea anchovy migrates in April toward north, thereby across the open sea as well as following the east and west coast of the Black Sea. From the end of May to September, the Black Sea anchovy spawns in the shallow waters along north shelf of the Black Sea (Ivanov and Beverton 1985; Prodanov *et al.* 1997; Daskalov *et al.* 2007). However, some studies have revealed that the anchovy spawns also in the south Black Sea along the Turkish coast (Einarson and Gürtürk 1960; IMS-METU 1993).

The anchovy is the main fishery resource in the Black Sea and its total catches had reached the maximum level of 606,000 tons in 1984 (FAO, 2011). The predator and competitor effects of *Mnemiopsis leidyi* mainly on anchovy eggs and larvae was a general fishery problem for all riparian countries around the Black Sea during the 1980s (Öztürk and Öztürk 2005).

The anchovy shoals are subject to the intensive commercial fishery along the Turkish and Georgian coasts during the winter period (Komakhidze and Mazmanidi 1998; Gücü and Bingel 2010). Considering the catch fluctuation of the anchovy in Turkey between 2000 and 2008, it was the lowest in 2003 with 163,549 tons while the highest in 2007 with 407,991 tons (Figure 1). Anchovy comprises of more than 70% of total fishery yield in Turkey (Figure 2).

Anchovy fishery is performed with purse seiners in the Turkish part of the Black Sea and the boat size generally varies from 15 to 50 m and net mesh size is 16 mm (net length: 730-1460 m; height: 110-180 m). There are several speculations, questions and wrong information for the anchovy catch in Georgia by Turkish fishermen in the Turkish public opinion and abroad.

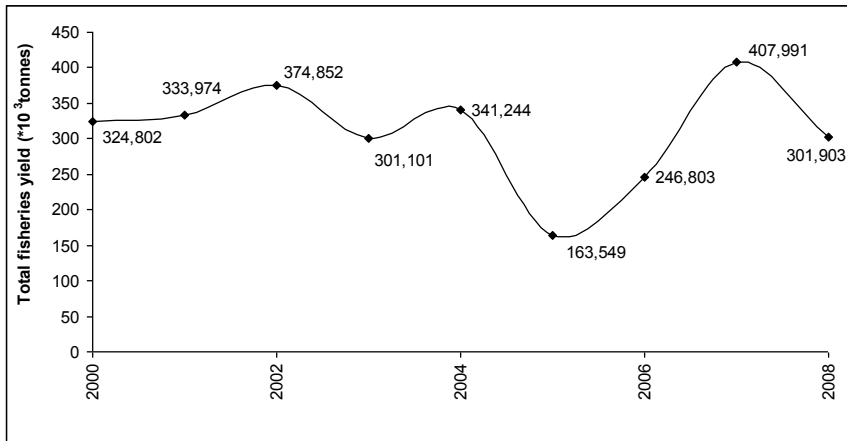
The aim of the study is to examine actual situation of the anchovy fishery in the Georgian water by the Turkish purse seiners to better

understand the catch amount by the Turkish fishermen and to propose some recommendations for sustainable fishing activities in Georgia.

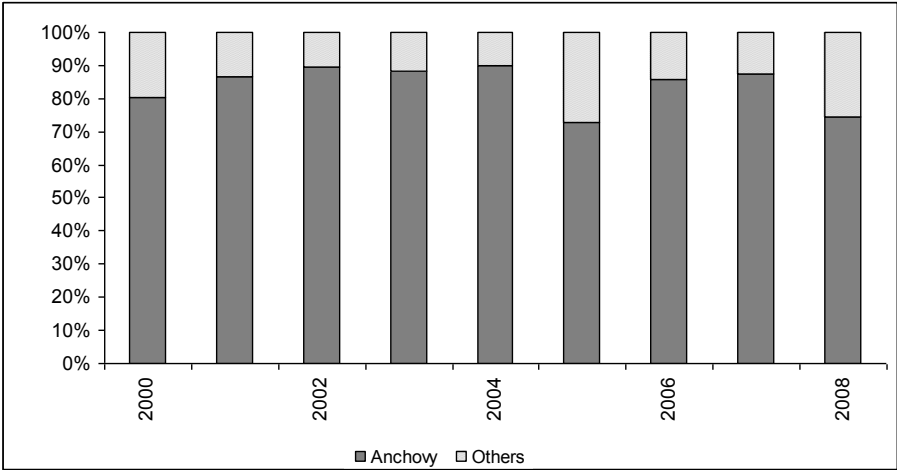
### ***Georgian Fisheries***

The coastline of Georgia on the Black Sea is 310 km, territorial waters extend from coastal line to 12 NM, while the exclusive economic zones (EEZ) extends to 200 NM (Figure 3). The total Georgian territorial sea area is about 6900 km<sup>2</sup>, while the area of its EEZ is about 115,000 km<sup>2</sup>. The Black Sea coast of Georgia is characterized by narrow shelf area. Poti and Batumi are the most important ports for Georgian fisheries.

There are 75 marine fish species and subspecies recorded from the Black Sea coast of Georgia and anchovy, sprat, whiting, spiny dogfish, scad, pickerel, red mullet, some gobies and Pacific mullet are the most important commercial species (Prodanov *et al.* 2004; Khavtasi *et al.* 2010).



**Figure 1.** Total fisheries yield of Turkey in Black Sea coast from 2000 to 2008 (Source: FAO, FishstatJ, 2011).



**Figure 2.** Percentage of the anchovy in the landings from the Turkish Black Sea from 2000 to 2008 (Source: FAO; FishstatJ 2011)



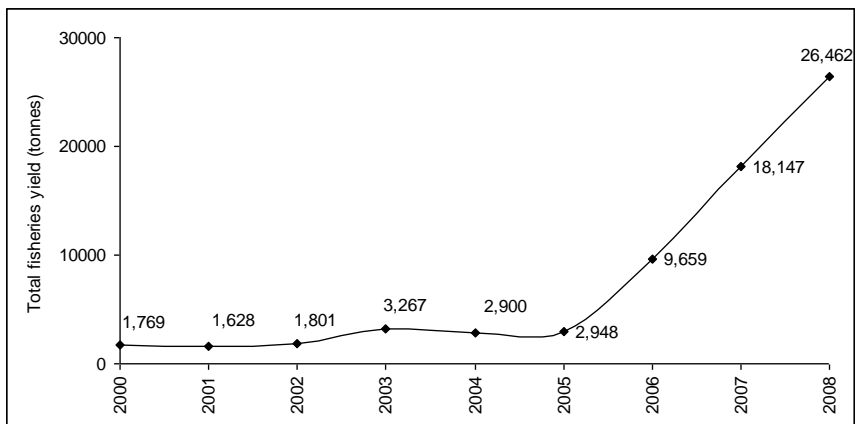
**Figure 3.** Map of Georgia (Source: <http://commons.wikimedia.org>)

In Georgia, the diversity of commercial fish decreased during the last 30 years. However, the catch increased, despite a near collapse in 1990, but this was almost entirely owing to the large anchovy fishery of Turkey (Khavtasi *et al.* 2010). Georgian fishing fleet consists of 36 medium sized seiners (110-225 HP) built in the Soviet era lack maintenance and modernization, and there are nearly 342 small-scale

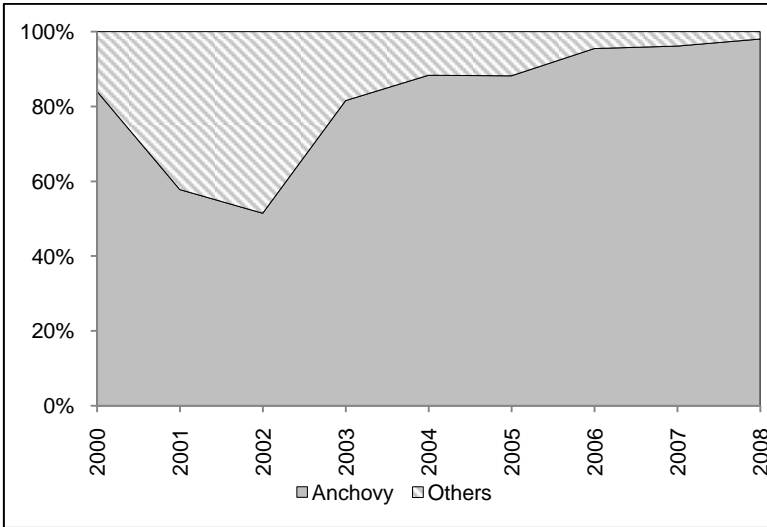
fishing vessels, most of which are motorized and wooden for coastal fishery (Khavtasi *et al.* 2010). These are equipped with seine nets (103), gillnets (324), bottom lines (12), cast nets (12) and fishing rods (100) for coastal fisheries activity (Van Anrooy *et al.* 2006).

While the average annual catch of anchovy in the Georgian Black Sea water was about 80,000 tons before 1988, this figure decreased to 2,000 - 7,000 tons during the 1990s. Small and insufficient fishing fleet in Georgia did not have the capacity to utilize its yearly anchovy quota (60,000 tons) (Khavtasi *et al.* 2010). Georgia did not struggle with decreasing fisheries trend during the 1990s. For this reason, Turkish fishermen have started to catch the anchovy in the Georgian Black Sea since 1996 by purchasing the permission from the Georgian authorities to catch fish, as well as receiving the permission from the Turkish authorities for operating overseas, their catch has started to increase since 2000.

The catch amount in Georgia has shown an increasing trend since 2005 (Figure 4). The proportion of anchovy in the total fisheries yield was the lowest (51%) in 2002 but increased to 98% in 2008 (Figure 5), as a result of increasing fishing effort. After 2007, a quota system started in Georgia for all fishing fleet and this quota was fixed as 60,000 tons for ten years.



**Figure 4.** Total fish yield off the Georgian Black Sea coast between 2000 and 2008 (Source: FAO; FishstatJ, 2011)



**Figure 5.** Percentage of anchovy in the total fishery yield from the Georgian Black Sea coast between 2000 and 2008 (Source: FAO; FishstatJ, 2011).

## Discussion

The official numbers of the Turkish purse seiners and transport vessels from 2003 to 2009 are shown in Table 1, based on the data provided by the Turkish Ministry of Agriculture and Rural Affairs (MARA). In spite that several boats have a yearly permission by the Turkish authorities, it is not obligatory to catch fish in Georgia every year. The fish landing port was designated only at Poti.

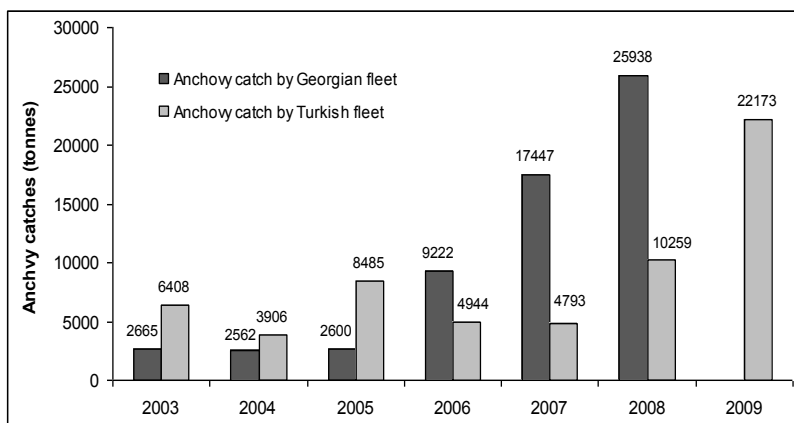
Total yearly quota has been 60,000 tons since 2007 for all fishing fleet, and this number has not been exceeded by the Turkish fishermen. Furthermore, the anchovy catch by Turkish fleet was the maximum in 2009 with over 22,000 tons (Fig. 6). In 2004, the catch amount was 3,906 tons with the minimum level. The total amount of the anchovy catch by Turkish fleet was 60,968 tons from 2003 to 2009. The anchovy is supplied to the fish oil and meal factories but this amount is not included. Some Turkish and Georgian companies established a joint venture for processing and producing fish oil and

meal in Georgia. Anchovy fishery in Georgia by Turkish fisherman is done generally from January to March.

**Table 1.** The number of Turkish vessels taking the permission for catching the anchovy in the Georgian Black Sea waters (Source: MARA)

Year	Number of fishing boats	Number of transport vessels
2003	27	7
2004	55	4
2005	68	24
2006	74	28
2007	55	15
2008	23	11
2009	18	9

According to Van Anrooy *et al.* (2006), Turkish and Ukrainian fleets started anchovy fisheries in the Georgian EEZ in the Black Sea in 1997, and there are some catch data. Considering the fisheries yield in 2003, the anchovy catch of Turkish fleet (4,235 tons) in this report was less than that in the present study (6,408 tons).



**Figure 6.** The anchovy catches by Georgian fleet from 2003 to 2008 (Source: FAO; FishstatJ 2011) and Turkish fleet from 2003 and 2009 (Source: Hopa Custom Directorate).



In addition, the same authors stated that the number of Turkish vessels for anchovy fishing increased from 200 to 316 in the waters near the Turkish-Georgian boarder and coast, and these vessels are threat to anchovy resources. However, this information is not confirmed and the officially reported number of boat is given in Table 1. Khavtasi *et al.* (2010) also claimed that the Turkish hired fleet would have a capacity to catch from 120,000 to 200,000 tons of anchovy per month. But, this estimation is not accurate and reliable considering that yearly permissible allowable anchovy quota was maximum 60,000 tons for all pelagic fish species for all fleet (Georgian, Ukrainian and Turkish) in Georgian waters. It seems that the authors did not carefully examine all information collected from the fishermen as well as with interviews.

Besides, the existence of illegal and unreported fisheries have also been reported from Georgia and 32 Turkish purse seiners were arrested between 2000 and 2010 due to the violation of relevant Georgian marine acts. Most of the Turkish fishermen and crew complained that Georgian detained procedures were not legally clear, their claims were weak, and the local authorities abused their rights.

The Bucharest Convention on environmental protection was signed in 1992 by six coastal states, and the Black Sea Strategic Action Plan was signed in 1996. The riparian states, however, have been unable to agree on a joint fishery convention so far, and cross-border fishing activities remain largely unregulated. All Black Sea states have established EEZs stretching up to 200 nautical miles beyond their territorial waters, where they generally treat vessels of different nationalities as trespassers (Knudsen and Toje 2008).

Fisheries management is fairly poor within the Black Sea states and there are no any legal banding documents for the fisheries management or sustainable fisheries. First fishery convention concerning the Black Sea was signed in Varna on 7 July 1959 between Bulgaria, Romania and Soviet Union but Turkey was excluded from this convention in that time. Besides, the anchovy was not a regulated

species in that convention. The Black Sea Economic Cooperation (BSEC) has taken some limited initiatives concerning maritime affairs. In the early 2000s, negotiations took place within the BSEC on whether a BSEC-wide agreement on a fisheries convention could be reached. Although extensive discussions took place, it was decided that BSEC should not conclude a fisheries agreement. However, BSEC takes part as an observer in continued negotiations about fisheries conventions under the auspices of the Black Sea Commission (Knudsen and Toje 2008). Duzgunes and Erdoğan (2008) also reported that the fishery resources need to be managed in the Black Sea.

In recent years, Romania and Bulgaria have become members of the European Union and a part of the common fishery policy of the European Union even though they have very few purse seiners and fishing fleet in the Black Sea. Except for these two states, the Black Sea riparian countries are not members of the European Union and to harmonize common strategies seem to be difficult in terms of living resource management. Moreover, Georgia has an agreement with Ukraine to catch fish, mainly anchovy, in the Georgian waters with otter trawlers. The catch statistics, however, were not reliable due to insufficient implementation at the fish landing harbours. As a consequence, even though some figures have been provided by several organizations such as FAO, these figures were not consistent and agreeable with each other and may not be reflecting actual situations.

In addition, Abkhazia has become *de facto* state and recognized by some countries at the political level as an independent state. Georgian state authorities do not have control over the area beyond the Anaklia River to Russian Border in the north of Abkhazia. In fact, more than 150 km shoreline and significant high sea area is under the control of Abkhazia and the fishing permission is given to whoever wants to fish by the local Abkhazian authorities with payment. Several Russian and Ukrainian trawlers and Turkish purse seiners caught anchovies at the beginning of 2011 with 30 fishing boats and the catch of 50,000 tons of small size anchovy was estimated. However, this type of fisheries is

continuing somehow and real catch figures are not recorded at the Turkish or Abkhazian market as fresh fish or materials for fish oil and meal. Russian and Ukrainian fishery in Abkhazia also needs detailed examination. This unreported and illegal fisheries needs to be managed and regulated according to the bilateral and regional cooperation to preserve anchovy stocks with respect of sovereignty of the neighbouring countries.

An urgent anchovy stock assessment study is suggested in order to manage Georgian fisheries in a sustainable manner. Because allocated 60,000 tons quota for pelagic fish for ten years is not based on scientific evidence, but on the necessity due the economical difficulties. This quota allocation may cause depletion of the anchovy stocks in the Georgian waters. Chashchin (1996) reported that in Georgian coast in 1991 total biomass of anchovy was 165,000 tons. But this information is quite old.

Finally, in the Black Sea, there are several shared stocks occurring within the economic zones of the two or more coastal states such as anchovy, bluefish, bonito and horse mackerel. These resources need sustainable management by riparian countries. GFCM should play more effective role for the fisheries regulations and to collect accurate fisheries information such as landing data, accurate catch records etc with the help of the riparian states.

# 2003 -2009 yılları arasında Türk balıkçı filosunun Gürcistan sularındaki hamsi (*Engraulis encrasicolus* (Linnaeus, 1758), avcılığı üzerine bazı tespitler

## Özet

Gürcistan sularında Türk balıkçıları tarafından 2003-2009 yılları arasında 60,968 ton hamsi avlanmıştır. Gürcistan, 2007 yılından beri pelajik balıklar için on yıl süreyle 60,000 ton kota uygulaması getirmiştir. Türk balıkçı filosunun Gürcistan sularında hamsi avcılığı 1996 yılında başlamış olmasına rağmen, 2003 yılından önceki av miktarları Türk ve Gürcü şirketleri arasındaki ikili anlaşmalara göre yapıldığından bilinmemektedir. Karadeniz’de iki veya daha fazla kıyıdaş ülkenin sularında birçok ortak balık stoğu bulunmaktadır. Ortak stokların korunması için bölgesel işbirliği önerilmektedir. Gürcistan balıkçılığının sürdürülebilirliğinin sağlanması için hamsi stoklarının acilen hesaplanması gerekmektedir. Abazya’daki avcılığın uluslararası hukuk ve devletlerin egemenliğine saygı göstererek denetim altına alınması da tavsiye edilmektedir.

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