



SCIENTIFIC, TECHNICAL AND ECONOMIC COMMITTEE FOR FISHERIES (STECF)

Review of Scientific Advice for 2011 Part 3b Advice on Stocks of Interest to the European Community in the Black Sea

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In Turkey, harvesting of Rapa whelk has been firstly permitted by MARA in 1983. The fishery sector expanded including fishermen, commission agents, industrial enterprises, especially in the Eastern Black Sea. In the beginning, 225 artisanal fishermen were operating with dredges (algarna) along eastern Black Sea, but the number of fishermen reached 421 in the next ten years (Zengin and Knudsen, 2006). Analysis of fisheries along the eastern coast of Turkey (Samsun Province) showed that number of vessels using dredges for Rapa whelk harvesting increased in 2000 - 2005, especially in the vessel group 33 -149 HP. These are typical boats that combine Rapa whelk dredging, bottom trawling and net fishing (Knudsen and Zengin, 2006). The large-scale implementation of dredges has a destructive effect on the bottom biocenoses.

The Turkish fishermen, working on Rapa welk, mostly have vessels with 6-17 m in length. A single dredge is used in vessels smaller than 8 m and the larger ones previously have used a pair of dredges. At present, the use of double dredges is prohibited by government regulations, but fisherman use them when fishing at night illegally. The number of vessels in Samsun district was 421 by 2005 and nearly half of them (232) had no licences for Rapa whelk fishing. These vessels intensely operate in inshore waters between depths of 5 and 33 m of dept (but mostly around 13 m).

The landings of Rapa whelk in Eastern Black Sea was 10 000 t in 1989, averagely changed around 3 000 tons (1 - 6 tonnes) between 1990 and 2000 according to TUIK official data. In the following decade landing of Rapa whelk increased and reached its maximum as 14 000 t in 2004. This trend continued more or less stable (11 000-14 000 tons) until 2009. A sudden decrease was recorded in 2009, as the landings dropped to 6 000 t. The increase in 2000 - 2010 may be explained by the depletion of major demersal stocks in the area and switching to Rapa whelk to take advantage of its high export value.

Until the early 1990s, along the Ukrainian coast, Rapa whelk was harvested in an amateurish way for fine shells used as souvenirs (BSC SOE, 2008). At the same time the meat of harvested mollusks was thrown away, or rarely used to feed animals and more rarely as an exotic meals for humans. Along the coasts of Ukraine the densest concentrations of Rapa whelk are found in depth 3-15 meters along the coast of the Crimea from Mezhdnoye (the Karkinitzky Bay) to the Cape Takil and in the Kerch Strait. In this area a specialized harvesting (by Khizhyak's drags and hand harvesting by Scuba divers) for Rapa whelk has been conducted since 1995. In the Black Sea the maximum harvesting of Rapa whelk was observed in 2000 at the level of 913 tons, among which 325 tons were harvested on the ground Cape Takil – Feodosia by 19 teams of harvesters, equipped with aqualungs and by 7 drags. In the Kerch Strait the maximum harvest of Rapa Whelk made up 49 tons in 2007.

4.7.3 State of rapa whelk stocks

Research on biological parameters, distribution and stock assessment (by drags and visual divers surveys) of Rapa whelk in the Ukrainian territorial waters were undertaken in 1990, 1994 and 1998 in the area from Takil Cape to Chauda Cape. Stocks were respectively assessed as 2.8 thousand tons, 1.5 thousand tons and 1.3 thousand tons. The former two assessments belonged to the initial commercial exploitation of this ground, the latter – to the period of the intensive fisheries. Reduction in Rapa whelk stocks from 1.5–2.8 thousand tons (virgin population in 1990-1994) down to 1.3 thousand tons (exploited population in 1998) is the evidence of drag fisheries impact. At the same time it is known that instead of the permitted by the Fisheries Regulations Khizhnyak's drag which is a sparing (protective) fishing gear of this class, knife-edge drags were widely used, affecting greatly the bottom biocenoses. In 1994 Rapa whelk stocks were assessed along the southern and western coasts of the Crimea from Cape Ilya to the Cape Evpatoriisky. Rapa whelk stock was estimated in this area as 14 thousand tons, and the limit for its harvesting in the waters of Ukraine has been established to 3 000 t. After 2000 small-sized Rapa whelks of 50-60 mm were predominant in the catches from this ground. The causes of the observed rejuvenation of Rapa whelk population at present are difficult to establish without scientific research activities. The most probable cause is overfishing, accompanied by the intensive harvesting of individuals of older ages (more than 75 mm long) and great amount of the illegal harvest. Since 2002 annual limit for Rapa whelk harvesting in the Ukrainian waters has been reduced down to 400 tons. After this reduction the fishing intensity has greatly decreased and by mid 2000s some increase in abundance and individual size has been noticed near the coast of the Crimea. In Ukrainian waters of the Kerch Strait in recent years surveys of Rapa whelk are made regularly (Fig. 4.7.3.1).

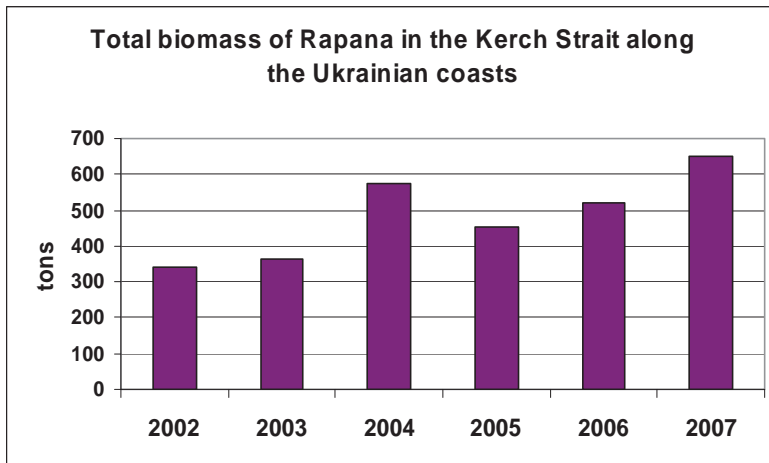


Fig. 4.7.3.1. The dynamic of Rapa Whelk biomass in the Kerch Strait, Ukraine.

The investigations conducted in the Black Sea shelf area and Kerch Strait found that the Rapa whelk age upper limit is 9 years and growth parameters in VBGF and natural mortality coefficients (M at age) are:

$$K=0.687 \quad t_0=-0.014; \quad L_\infty= 9.55 \text{ cm}; \quad M_t: \quad M_2= 0.12, \quad M_3= 0.54; \quad M_4= 1.28, \quad M_5= 1.40$$

Prior to the start of Rapa whelk regular harvesting in Bulgaria, the biomass on the coastal grounds between Kaliakra and Pomorie have been estimated at about 2 thousand tons (Prodanov and Konsulova, 1993). Taking into account all the area and the buried part of mollusks, its total biomass is assessed as 7.5 thousand tons. The average shell length of Rapa whelk in 1984 was 71.1 mm (Prodanov and Konsulova, 1995). Bottom trawling and dredging have officially been forbidden, but these fishing gears are still illegally used in Rapa whelk fishery. According to the assessments of the Private Bourgas Fishery Association, Rapa whelk landings are almost 7 times higher than the official report 8557 tons in 2005 (TDA Technical Task Team National Experts, Bulgaria report, Raykov, 2006).

Growth rate of *R. venosa* along Bulgarian Black Sea coast was investigated and population parameters and natural mortality coefficient were estimated (Prodanov et.al, 1995). The following values of von Bertalanffy parameters were established (Prodanov et.al, 1995):

$$\begin{array}{ll} L_\infty= 123.98 \text{ mm} & W_\infty = 423.75 \text{ g} \\ k = 0.214 & k = 0.1989 \\ t_0 = - 0.0822 & t_0 = - 0.2203 \end{array}$$

The mean value of natural mortality coefficient was estimated at 0.5 (Prodanov et.al, 1995).

Distribution of Rapa whelk catches by size and age groups during the survey in 1992 (Prodanov et.al, 1995) is given on Fig. 4.7.3.2.

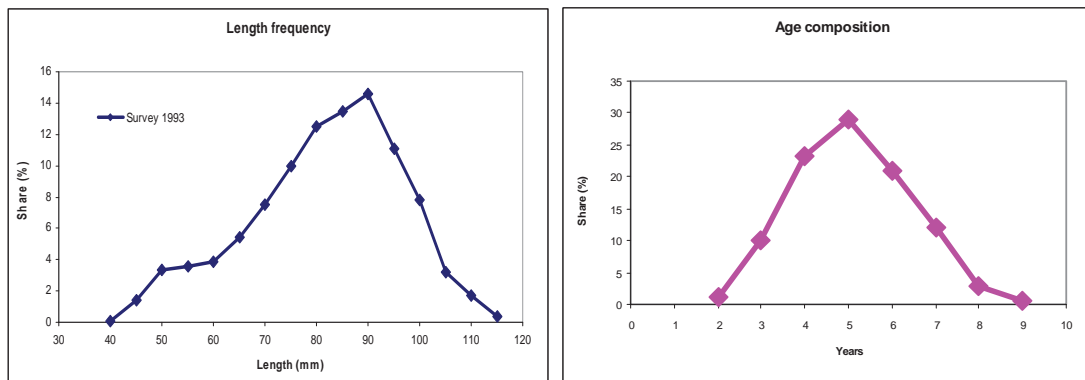


Fig. 4.7.3.2. Size and age structure of *R. venosa* in 1992 along the Bulgarian Black Sea coast (after Prodanov et.al, 1995).

Illegal bottom trawling for harvesting of *R. venosa* along the Bulgarian Black Sea shelf has raised ecological concerns with respect to the benthic communities and especially the mussel beds. The population decline of the habitat-structuring species *Mytilus galloprovincialis* in the impacted areas was accompanied by degradation of the associated benthic community from "mussel bed" type to "silt bottom" type dominated by opportunistic polychaetes and oligochaetes (Zenetos et al, 2003).

National Agency of Fisheries and Aquaculture start to collect data for export of Rapa whelk and CPUE data, which could be used for estimation of real value of landings – Table 4.7.3.1 and Table 4.7.3.2.

Table 4.7.3.1. Export data of Bulgaria for *R.venosa* in 2009.

Origin	Net weight (kg)
BULGARIA	
Frozen Rapa whelk	146164
frozen sweetbread from Rapa whelk	326178
frozen meat from Rapa whelk	572102
frozen meat from Rapa whelk with shells	59204
Total	1103648

Table 4.7.3.2. Catch per unit effort (kg/h) of Bulgaria on Rapa whelk fishery by fleet segments in 2008 and 2009.

Fleet Segment	LOA > 0 < 6		LOA => 6 < 12		LOA => 12 < 18		LOA => 18 < 24		LOA => 24 < 40	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
<i>Rapana</i>										
RPN	305.69	238.38	461.88	529.95	722.83	611.99	744.84	768.24	no	no

In the Romanian Black Sea sector, *R. venosa* was first found in 1961, in the Danube delta (Grossu, 1964), from where it rapidly spread towards the South, becoming a common species (Gomoiu, 1972). Today it is encountered on all types of substrate (rocky, sandy, or muddy) at depths between 3 and 45 m.