

## Characteristics of fish species of the Baltic Sea - Part 2

**Beata Draszawka – Bołzan, Piotr Daniszewski\***

Faculty of Biology, University of Szczecin, 13 Waska Street, 71-415 Szczecin, Poland

\*E-mail address: [daniszewski73@gmail.com](mailto:daniszewski73@gmail.com)

### ABSTRACT

The emergence of the Baltic Sea cemented the Scandinavian ice sheet. The sea began to form at the end of the Vistula glaciations when melt water from the glacier began withdrawing accumulate on today Gdańsk Bay and expanding, with time its surface. Around 10,200 years ago, there was a freshwater lake ice is also supplied with water running off lying to the south. After this period, the rapid warming, which caused a rise in the water level and connected to the waters of the North Sea today. Oldie sea arose, also called the mussel living in it. As a result of the disappearance of the ice caps caused by climate warming, followed the slow rise of Scandinavia. The Baltic Sea is one of the youngest seas in the catchment area of the Atlantic Ocean. Created 12,5-13 thousand. years ago, after the last glaciation. Today the Baltic Sea, such as we see it, is the result of changes occurring with time approx. 2.5 thousand. years ago. It is very specific, unique sea in the world.

**Keywords:** Baltic Sea; *Hyperoplus lanceolatus*; *Gadus morhua*; *Syngnathus typhle*; *Acipenser sturio*; *Acipenser oxyrinchus oxyrinchus*; *Agonus cataphractus*; *Salmo salar*

### 1. INTRODUCTION

The emergence of the Baltic Sea cemented the Scandinavian ice sheet. The sea began to form at the end of the Vistula glaciation when meltwater from the glacier began withdrawing accumulate on today Gdańsk Bay and expanding, with time its surface.

Around 10,200 years ago, there was a freshwater lake ice is also supplied with water running off obszerów lying to the south. After this period, the rapid warming, which caused a rise in the water level and connected to the waters of the North Sea today. Yoldi sea arose, also called the mussel living in it. As a result of the disappearance of the ice caps caused by climate warming, followed the slow rise of Scandinavia.

This has led to about 8900 years ago to the emergence of another lake that of living in the waters of the lake mollusk called ancylusowym. Further elevation of Scandinavia, and the simultaneous reduction of the southern coast of the Ancylus Sea has given rise to a new

connection to the North Sea. Littorina Sea were formed (from the name of the worm) with a greater range and more salty than the present Baltic waters. Baltic sizes of today was built around 2000 years ago. During this period, its area decreased as a result of continuous improvement of the land, which had an impact on the more limited contact with the North Sea in shallow Danish straits.

The Baltic Sea is a sea of the Atlantic Ocean in continental, cutting in the northern part of the continent of Europe. It is highly elongated and fragmented, separated from the world's ocean shallow, narrow and winding straits, greatly limiting the inflow of saline water. It is the sea salty relatively shallow - average depth of 53 meters, with a unique, albeit limited, of biodiversity. It has a very large catchment area - 4.5 times the area of the Baltic Sea. Is surrounded by eight countries of the European Union and Russia, although in its catchment area are also areas of Belarus, Ukraine, Czech Republic and Norway.

The Baltic Sea is currently one of the most polluted and exploited robbery seas in the world. Overfishing, imbalance of oxygen as a result of eutrophication, as well as the work of mining and pollution with toxic substances, affect the entire ecosystem imbalance. The sea is the world's largest brackish water tank. Salt water passes through the narrow strait only Danish and therefore its replacement may take up to 30 years. Difficult biological conditions cause the reproductive capabilities of some species are very limited, and thus dramatically reduces the biodiversity of the Baltic Sea.

## 2. *HYPEROPLUS LANCEOLATUS*



**Photo 1.** *Hyperoplus lanceolatus*

### **Range**

North-East Atlantic Ocean along the European coast and the Baltic Sea, to a depth of approx. 60 m. Numerous in the Polish coastal waters.

### Description

Body elongated oval in cross section. Long head, the lower jaw hanging. The dark spot on each side of the mouth. Short and long dorsal fin reaches the base of the tail. Silver coloration, dark ridge. The lateral line is clear.

Reaches an average of 20-30 cm, maximum 35 cm in length. It feeds on zooplankton and small fish.

### The economic importance

Species of minor economic importance, caught in angling.

### 3. *GADUS MORHUA*

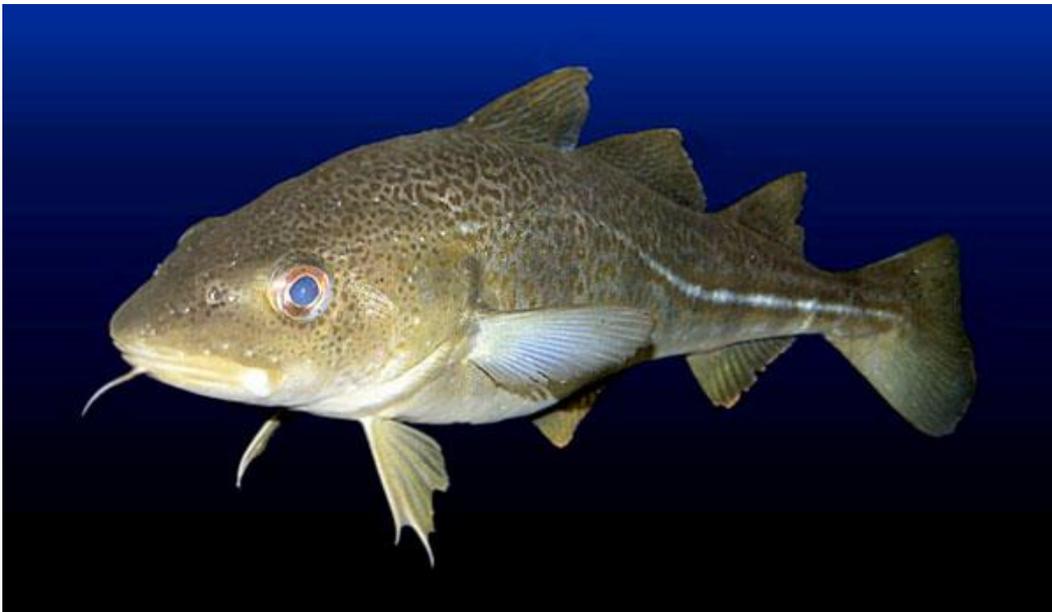


Photo 2. *Gadus morhua*

In Poland, as cod is usually referred to the three subspecies of the Atlantic cod, of which the most famous is the Baltic cod (*G. morhua callarias*) also called pomuchlą. Related to the Atlantic cod species are: Pacific cod (*G. macrocephalus*), ogak (*G. ogac*) as well as the kind of arctic cod *Arctogadus*.

As is readily accessible and nutritious fish cod Fair game was of great importance in the development of civilization coast of the North Atlantic, being the "bread and butter" of many societies. For many countries, the fishing industry is still one of the most important fish caught.

In the competition for the dwindling international conflicts occurred. Today cod has become a symbol of unsustainable fishing - due to overfishing, especially of the population in the western Atlantic Ocean and the North Sea and the Baltic, the more recent common species is vulnerable to extinction. In Poland, the mid and management of fisheries are a major concern and an important political issue.

#### 4. *SYNGNATHUS TYPHLE*



**Photo 3.** *Syngnathus typhle*

An elongated body, a very narrow cross-section siedmiokątnym covered rings armor with the bone plate, three per side and one on the stomach. At the end of the body can be seen clearly, Ripiphoridae caudal fin. The body length of 35 cm. The mouth is laterally strongly flattened, with a length greater than half the length of the head, turned into a tube, mouth directed obliquely upwards. On the sides of the chest pletewki fine. No anal fin.

#### **Procreation**

During spawning season in the final part of the body grows bag breeding male. During mating the female lays her eggs tens. There followed their conception. After a month of young fish with a length of 2-3 cm, moving in the bag, tear it and flow into the water.

#### **Protection**

Polish complex species is strictly protected species.

## 5. *ACIPENSER STURIO*



**Photo 4.** *Acipenser sturio*

### **Occurrence**

Along the shores of the Atlantic Europe, the Mediterranean and the Black Sea. In lakes Ladoga and Onega only creates a form of freshwater. His presence in the Baltic Sea has been questioned by molecular studies conducted on laborious caught up in 1996 in Estonia. These studies indicate that the population of the Baltic sturgeon comes from the Atlantic sturgeon (*Acipenser oxyrinchus*).

### **Morphological characteristics**

The back is blue-gray or gray-green, covered with a row of bony plates 10-13 clear that in young individuals often narrow spikes. On the silvery sides occurs from 24 to 40 charts, white belly 10-13. The snout is pointed, elongated. Mouth almost square, it takes almost 2/3 of the width of the mouth. Whiskers are devoid of appendages and circular in cross section. The first ray of chest fin is very thick. Sturgeon typically reaches a length of 1.5-2.5 m, record up to 4 m 300 kg weight.

### **Nutrition**

Young sturgeon initially feed on invertebrates bentonicznymi. Later, their food is benthic animals that dig in soft ground ryjkowatym mouth. These are mainly molluscs, crustaceans, insect larvae, and sometimes small fish.

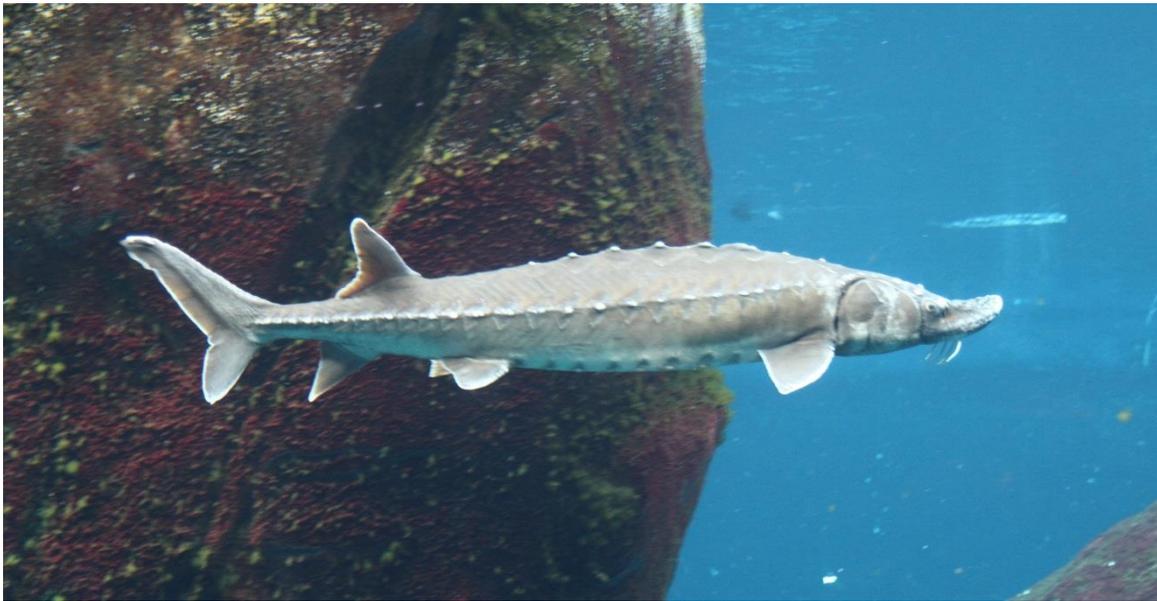
### Procreation

Males reach sexual maturity at the age of 7-9 years and 8-14 females. Hiking spawning take place in April and May, and the same spawn in June and July. For reproduction needs water at a temperature of at least 20 ° C. The roe is made deep pits that are dug in the gravel in places with slow current. The female lays between 400 000 and 2 500 000 grains. After spawning broodstock flow into the sea. The larvae hatch after 3-5 days. Remain in freshwater for 1-3 years. In the sea spends at least 7-8 years.

### Protection

In Poland, the sturgeon is covered by strict protection. According to the Polish Red Book of Animals (2001.) Stops, the status of the species is in Polish. For about thirty years these fish probably not in Polish waters. Last sturgeon were observed or were caught in the Gulf of Gdansk and the Vistula River between Chetmno and Torun. To eradicate sturgeon in Poland contributed to overfishing, pollution of the Baltic strong and larger rivers, construction of ports and firewalls.

## 6. *ACIPENSER OXYRINCHUS OXYRINCHUS*



**Photo 5.** *Acipenser oxyrinchus oxyrinchus*

In the Baltic Sea sturgeon probably appeared 15 000-10 000 BC From the Neolithic and the Early Middle Ages known documentary evidence of the presence of the fish in the Baltic Sea - petroglyphs at Besov Nos peninsula and the remains discovered sturgeon bone parts, among others, in Wolin and Gdansk. Research shows that most sturgeon were caught in the eighth century. Since then, the size of the population continued to fall. At the beginning of the twentieth century there was such a large decline in the population of the fish lost its economic importance. Partial bans on fishing was introduced in 1918 and 1932 in Western Pomerania in

the Vistula basin. Since 1936 a total ban on fishing in force, which did not protect the fish from extinction.

According to the Polish Red Book of Animals Baltic sturgeon is a species of atrophy in Poland (category S). Since the 40s of the twentieth century, there was no presence of juveniles. Last individuals recorded in Polish in 1965 in the lower Vistula, near the mouth of Chelmno and the Vistula River in 1972, and probably the last of the Baltic population caught in May 1996 in Estonia. Since 1996, work is underway aimed at restoration of sturgeon in Polish waters. This work is coordinated by the Inland Fisheries Institute in Olsztyn, in collaboration with the Institute of Water Ecology and Inland Fisheries in Berlin Restitution Project Migratory Fish in Poland.

Atlantic sturgeon spent most of his life in the Baltic Sea. For the spring spawning period affect the upper river (Vistula, Oder, Niemen, Dvina and Neva). He was a long-lived fish, late maturing sexually. Male reproductive reached between 12 and 15 years of age, females two to three years later. Young fed on zooplankton, invertebrates later, as adults ate molluscs, crustaceans and small fish.

An important distinguishing feature from other Baltic sturgeon sturgeon found in Polish waters is the mass of the body, which in adults Baltic sturgeon greatly exceeds 100 kg, compared to a few pounds for refugees from breeding - usually sturgeon, Russian and their hybrids. Dorsal coloration of variables - from ciemnooliwkowego to almost black, sides silvery, belly almost white. Bone plates contrast with the rest of the body.

## 7. *AGONUS CATAPHRACTUS*



**Photo 5.** *Agonus cataphractus*

### **Range**

European North Atlantic coast and the adjacent sea, the Baltic Sea in the south.

### Characteristic

Body covered with rows of bone forming charts difficult to remove the armor. Head wide, triangular, with two appendages over the opening mouthparts. Pectoral fins large, rounded. Gray-brown back and sides, with four dark streaks. Do not have a swim bladder. It grows up to 21 cm in length.

### Lifestyle

It prefers cool coastal waters with a sandy bottom, winter flows at greater depths. It feeds on crustaceans and polychaetes. Sexual maturity is reached approx. 1 year old. Spawning takes place from February to April. Spawn in the amount of up to 3,000 eggs is made in seaweed. The larvae float in the water for 10 to 11 months, feeding on plankton.

## 8. *SALMO SALAR*



Photo 6. *Salmo salar*

### Occurrence

In the northern part of the Atlantic, in the rivers of North America, in Europe, from Portugal to the White Sea, the North Sea and the Baltic. In lakes Ladoga and Onega created exclusively freshwater forms.

### Description

It grows up to 150 cm in length and 24 kg body weight. According to oral tradition Drawsko salmon population (also called royal) reached 150 cm and up to 46 kg weight. Scales small, firmly attached. The lateral line is clearly visible. On the back line there is a small, reddish-gray adipose fin (typical for salmonids). The head of a large and strongly toothed jaws. During spawning males change to reddish coloration, and takes the shape of a hook jaw. Young are on the sides of dark and red spots. Adults have irregular black spots on the upper half of the body.

## **Nutrition**

Salmon is a fish predatory initially feeds planktonic crustaceans and insect larvae, then fish and crustaceans quent.

## **Procreation**

Typical anadromous fish, ie. At the time of breeding wandering the seas rivers. During this journey the salmon are guided by the scent of water in the place where the future of the world. While crossing the border freshwater and saline taking place in their bodies biochemical and physiological changes. During the journey does not take food. Spawning takes place in autumn, in the cold, well-oxygenated water with a strong current. Roe with up to 30 000 grains (diameter 4-7 mm) is folded into a pit dug by the female in the sandy or rocky bottom. The larvae hatch in the spring. They have a length of about 2 cm. Yolk sac resorption period lasts about 40 days. After spawning many animals are killed. Juveniles spend 2-3 years in rivers, then migrate to the sea, then take the gray-green color on the back and silvery on the sides and belly (ie. Smolt). In the sea to spend the next 2-3 years, after which they return to the same river to spawn.

## **9. CONCLUSIONS**

Because the Baltic Sea catchment area inhabited by tens of millions of people, ecosystems of this small, shallow seas are exposed to many dangers. On the Baltic Sea transport is growing in the Baltic cities - industry, in the resorts - tourism. With agricultural land flows into the sea huge loads of nitrogen, phosphorus and other pollutants. The intensity of industry, agriculture and tourism around the Baltic Sea, as well as transport in its waters, far exceeds the strength of the marine environment and threatens his little biodiversity. In addition, excessive fishing pressure and irresponsible fishing practices in the sea so much exploited, could lead to the collapse of the major vertebrate populations in the Baltic. Therefore, species found in the Baltic and the quality of its waters require effective and far-reaching protection.

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