

# Morphometric Assessment of the South Caucasian Pillowbill (*Blicca Bjoerkna* Linnaeus, 1758) Found in the Araz Reservoir

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## Abstract

The study is focused on identifying fish species of fishery importance that are distributed across part of the Araz water reservoir within the Nakhichevan Autonomous Republic. The study was conducted between 2018 and 2021. Samples were collected using nets, strainers, and fishing rods, and materials (samples) captured by the "Nakhchivan Fish Farm" were also used in the study. The South Caucasian fish is found in the middle and lower reaches of the Kura River, in the swamps around Ganikhchay, in the lakes around the Kura, the Akhmaz, the Mingachevir reservoir, the Araz, Nakhchivanchay, Arpachay, as well as in the rivers of the Lankaran natural region, and in the port of Devechi within the borders of Azerbaijan. The fish has also been recorded in rivers flowing into the Caspian Sea [1-3]. Based on years of research conducted in the Araz reservoir, it was determined that the South Caucasian carp is distributed across all areas and biotopes of the reservoir. It is more commonly found in shallow areas, such as Garachug, Shorsuchay, and Yamkhana. According to the results of Vatega fishing, the carp ranks third among the fish caught.

## Introduction

The age composition of adult carp in the reservoirs consists of 2-8 year-old fish. Both female and male individuals reach sexual maturity at 3-4 years of age. In the reservoirs, the body length of carp individuals that have reached sexual maturity ranges from 10-29 cm, with most being between 16-22 cm. In those years, the average body length of carp individuals in the reservoir was 17.4 cm. At the end of the first year of life, the body length of carp was, on average, 4.9 cm; at the age of 2, it was 8.8 cm; and at the age of 3, it was 15.2 cm. Starting from the fourth year of life, the growth rate of body length decreases. In groups with the same body length, the mass of females is slightly higher than that of males. This is due to the higher degree of gonadal maturation in females [5]. The yastigarin is distinguished by its rapid mass growth in

the Araz reservoir. In the second and third years of life, the mass of the fish increases by 2.5 times, and by the end of the third year, it reaches an average of 102.7 g, with a range of 75-117 g. In 4-year-old individuals, the mass increase was 50.8 g, and in 5-year-old individuals, it reached 104.7 g. The maximum mass increase was 113.3 g and was recorded in the seventh year of the yastigarin. The growth rate of yastigarin distributed in different regions of the country until reaching sexual maturity is almost the same. Differences in growth rate begin at the age of 2 and are most pronounced at the age of 3 [5] (Table 1).

The fact that juvenile individuals of the common eel, located in different geographical zones, have a similar intensive growth rate is probably due to the similar characteristics of their nutrition in the first year of life (during this period, they feed intensively on zooplankton).

**Table 1:** Age dependence of growth rate in individuals

Indicators	Age, in years							
	1	2	3	4	5	6	7	8
Length, cm	4,9	8,8	15,2	18,4	20,4	22,5	24,0	25,2
Height, cm	4,9	3,9	6,4	3,2	2,0	2,1	1,5	1,2
Average length increase, %	100	79,6	130,6	65,3	40,8	42,9	30,6	24,5
Mass, g	9,3	11,9	82,3	50,8	104,7	90,3	11,3	71,2
Growth, g	100	127,9	403,4	43,5	68,2	34,9	31,9	15,5
Average mass increase, %	1,7	2,2	15,5	9,7	19,7	17,0	20,9	13,4
Number of fish	61	60	60	52	50	50	50	30

Note: The table shows the average value of the calculations.

Parts of plant origin in the diet were found in the intestinal contents of fish with a body length of more than 9.8 cm. The value of the annual growth rate is determined by the richness of the food base in the reservoirs, the temperature regime of the water, and the feeding of fish during the long vegetation period. Due to the abundance of the natural food base in the Araz reservoir, the length and mass growth of the carp living here is significantly higher than that of the carp individuals distributed in other reservoirs. Especially, the fish belonging to the upper age group are fully provided with food, so their growth is also rapid [6].

## Materials and Methods

The samples taken from the lakes where the study was conducted were cleaned with water from the area where they were caught and separated according to their sizes. The fish were laid on their sides and shaped as neatly as possible. A 4% formaldehyde solution was added until the samples were covered, and they were allowed to harden for 2-3 days. Morphometric measurements of the fish were carried out using calipers. The obtained fish were processed using the variation-statistical method, and the variation rows were corrected and calculated using the arithmetic mean formula. The exterior dimensions of the caught animals were recorded, and the accuracy of the results was determined. Both systematic and ecological analyses of the species were performed. To neutralize the acidic nature of formaldehyde, which causes discoloration over time, one



Figure 1: Blicca bjoerkna.

**Table 2:** Evaluation of some characteristic features of the species Blicca bjoerkna

Assessed symptoms	is being evaluated
Standard length mm (n=10)	70,42
Standard height in %	
Head length	25,94
Head height	37
Predorsal distance	55,82
Pectoral-pelvic distance	22,53
Dorsal fin height	30,26
Anal fin height	21,30
Pectoral fin length	23,30
Pleural fin	21,07
Tail body length	10,32
Tailstock height	12,79
Nose length	6,58
Eye diameter	8,25
Distance between eyes	9,23

tablespoon of boric acid solution ( $\text{Na}_2[\text{B}_4\text{O}_5(\text{OH})_4] \cdot 8\text{H}_2\text{O}$ ) was added to every 5 liters of the 4% formaldehyde solution. The hydrochemical parameters of the water were measured using a "Horiba" device.

**Morphological characteristics of the species:** The body is tall, flattened, and short from the sides. The length of the head is 25.94% of the standard body length. The mouth is located ventrally. The eyes are quite large. The diameter of the eye is 8.25% of the standard length, and the height of the caudal fin is 12.79% of the standard length. There are 46 scales on the lateral line; 8 scales between the beginning of the dorsal fin and the lateral line; and 9 scales between the beginning of the anal fin and the lateral line. The dorsal fin (I) has simple, 7-branched rays, and the free edge of this fin is bent inward. The anal fin (II-III) has simple, 19-branched rays, and its free edge is bent inward. The pectoral fin (I) has simple, 7-branched rays, with the free edge convex (bent outward). The pelvic fin

(I) has simple, 8-branched rays, with the free edge convex. The caudal fin is forked, with rounded lobe tips (Figure 1).

**Characteristic evaluation:** There are 45-49 scales on the side. The anal fin is characterized by the presence of 19-23 branched rays, and the body is flattened from the sides. Additionally, in living individuals, the paired fins are red or orange in color (Table 2).

**Body color and pattern:** The overall body color of the specimens obtained is yellowish. The top is brown, while the sides and abdomen are yellowish. The fins are generally dirty white. The first ray of the dorsal fin is dark brown, and the others are dirty white. The lateral line is prominent.

**Habitat:** They generally prefer to live in shallow, vegetated, and warm areas of lakes and rivers.

**Geographic distribution:** They are distributed in the Kura and Araz rivers in the Marmara and Thrace basins.

## Results and Discussion

As a result of the research conducted from 2018 to 2022, considering the materials collected and literature data, it was determined that 33 species of fish inhabit the area, belonging to 6 orders, 9 families, and 28 genera. The identified species belong to the following 9 families: Acipenseridae, Salmonidae, Cyprinidae, Balitoridae, Cobitidae, Siluridae, Poeciliidae, Cobiidae, and Percidae. The morphometric characteristics of *Blicca bjoerkna*, a species widespread in the Araz reservoir, were calculated.

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