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BIOCHEMICAL PARAMETERS OF BLOOD IN CARP CULTURED IN ARTIFICIAL RESERVOIRS

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ABSTRACT

This study investigates the biochemical parameters of blood in carp cultured in artificial reservoirs in the Samarkand district, taking into account the hydrochemical characteristics of the water and the fish's living conditions. One of the key aspects of fish reared in artificial water bodies is the state of their blood, which makes the study of biochemical parameters particularly important. The biochemical composition of blood varies depending on the habitat and lifestyle of different fish species.

Keywords: *carp, blood, phosphorus, glucose, protein, creatinine cholesterol.*

INTRODUCTION

Meeting the population's demand for animal-derived products, including fish proteins and vitamins, is of great importance. In recent years, particular attention has been paid to the development of the fisheries sector in our country. Ensuring the supply of livestock products, including fish proteins and vitamins, for the population of Uzbekistan remains a priority [1].

In Uzbekistan's water bodies, fish farming focuses on the intensive breeding of fast-growing species. With the transition of fisheries to an industrial basis, the study of how suboptimal growth conditions affect fish remains highly relevant [2].

Fish require water bodies that not only support their survival but also provide adequate nutrition, promote growth, rapid weight gain, and reproduction. The closer the water quality and feed match the fish's physiological needs, the more successful their growth and development will be.

Objective of the Study. To analyze the adaptation of carp cultured at the "Oq Amur Fishery" in the Samarkand district to the influence of abiotic and biotic factors.

MATERIALS AND METHODS

The study was conducted from October 2025 to April 2026 on two-year-old carp cultured in artificial reservoirs. Water temperature was recorded daily, and hydrochemical parameters were measured every two weeks at a depth of 1 meter using standard methods.

The biochemical parameters of fish blood were analyzed using standard laboratory procedures [6]. A biochemical analyzer was employed to determine the blood parameters. Specifically, total protein was measured by the biuret method, glucose by the glucose oxidase method, creatinine by a picric acid-based reaction, cholesterol by an enzymatic method, and phosphorus using the UV method.

The fish were fed twice daily. In addition to the aforementioned measures for proper fish maintenance, the fish were captured once a month. The captured fish were weighed, and their biochemical status as well as the presence or absence of diseases were recorded [7].

For each blood parameter, the mean, minimum, and maximum values, as well as the standard error, were calculated. The experiments were processed and analyzed using standard statistical methods.

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RESULTS

According to our experiments, water quality parameters for carp breeding must meet the standards established for artificial reservoirs. The following hydrochemical characteristics of the water were recorded (values in parentheses correspond to GOST 15372-87 standards): pH 7.4–7.5 (7.0–8.0); color 26° (30–32); dissolved oxygen 6.5–10.2 mg/L (not less than 6 mg/L); nitrogen of ammonium compounds 0.46 mg/L (0.5); total hardness 3.8 mg/L (3.5–4.1).

The biochemical parameters of the blood plasma of the carp in the experiment were found to be within normal ranges. When analyzing the protein content in carp blood (Table 1), we observed that while protein levels were generally consistent, slight variations were present not only among individual fish but also within fish of the same species.

Table-1

Biochemical Parameters of Blood in Two-Year-Old Carp

Biochemical Parameters of Blood in Two-Year-Old Carp	Reference Rangr e	march	april	may	june
Phosphorus, mmol / l	0,5-9,4	4,21±0,14	5,1±0,03	5,3±0,01	5,11±0,02
Glucose , mmol / l	1,7-4,1	1,59±0,01	1,57±0,017	2,20±0,002	2,23±0,011
Cholesterol , mmol / l	1,98-4,1	2,8±0,3	2,7±0,08	3,1±0,19	2,69±0,01
Creatine , mkmol / l	0,27-0,8	0,35±0,02	0,41±0,012	0,60±0,07	0,58±0,071
Total protein , g / l	9-30	9,8±0,09	15,1±0,32	24,5±0,33	29,1±0,44

These parameters are closely associated with metabolism and are determined by the intensity of feeding. Protein deficiency in the fish body can lead to infectious diseases and cause kidney damage in carp. The results of the study indicate that during the spawning period in artificial reservoirs, the total protein concentration in the blood plasma of two-year-old carp typically ranges from 10 to 30 g/L, with 9.7 g/L in April, 14.4 g/L in May, 24.1 g/L in September, and 28.91 g/L in October. Phosphorus levels were within the normal range (0.5–9.4 mmol/l), with concentrations of 4.21 ± 0.14 mmol/l in March, 5.10 ± 0.03 mmol/l in April, 5.30 ± 0.01 mmol/l in May, and 5.11 ± 0.02 mmol/l in June.

Our study demonstrated that the biochemical parameters of protein and phosphorus in the blood plasma of carp remained within normal limits. During the experiment, as the carp grew and gained body weight, an acceleration of metabolism was observed. This was accompanied by significant increases in the concentrations of total protein, glucose, phosphorus, and cholesterol in the blood plasma.

The results of our study showed that the total protein concentration in carp blood plasma increased from 9.7 to 28.91 g/L, while glucose rose from 1.57 to 2.30 mmol/ l. Furthermore, phosphorus levels remained within the normal range, varying from 4.20 to 5.81 mmol/ l.

One of the key biochemical indicators is blood glucose. Our research demonstrated that glucose levels in carp blood increase with age. In the studied carp, glucose concentrations ranged from 1.57 to 2.30 mmol/ l (Table 3). Although glucose levels remained within physiological limits, they showed a dynamic increase. The cholesterol concentration in carp blood plasma ranged from 2.6 to 3.3 mmol/ l, which is within the normal biochemical range.

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CONCLUSION.

The results of the study indicated that the biochemical parameters of protein and phosphorus in the blood plasma of two-year-old carp remained within normal limits. This can be explained by the acceleration of metabolism in the fish as they grew and gained body weight. Significant increases were also observed in the concentrations of total protein, glucose, phosphorus, and cholesterol in the blood plasma.

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