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Serum Biochemical Parameters of common carp(Cyprinus carpio)

Hamideh Ghodrati Azadi*

*Department of basic Sciences, School of Veterinary Medicine, Ferdowsi University of Mashhad, Mashhad, Iran. P.O. Box 91775-1793, Mashhad, Iran

e-mail: ghodrati@ferdowsi.um.ac.ir

چکیده- ماهی کپور اهمیت زیستی زیادی داشته و به طور وسیع در سراسر دنیا استفاده می شود. اطلاعات در مورد پارامتر های بیوشیمیایی خون این آبزی کمک شایانی به ارزیابی سلامت آنان و بقا در محیط زیست می نماید. بدین منظور مقادیر بیوشیمیایی سرم 60 ماهی کپور (از هر دو جنس)مورد ارزیابی قرار گرفت. محدوده مقادیر گلوکز (GLC; 0/42 ± 0/015 g/L) ، کلسترول (CHL; 1/.7± 0/07g/L) ، پروتئین تام (TOP; 33/2±0/6 g/L)،آلبومین (ALB; 15/1±1/5g/L)، کراتی نین (CRT; 0/035±0/002 g/L) ، اوره (0.04±0/002g/L)، لاکتات دئیدروژناز (LDH; 115/2±8/22 U/L)، آسپارتات ترانس آمیناز (AST;48/2±3/6 U/L) ، آلانین ترانس آمیناز (ALT;21/2±3/6 U/L)،تری گلیسیرید(TRG; 1/01± 0/1g/L)، آلکالین فسفاتاز (ALP;37/2±5/5 IU/L)واسید اوریک (UA;0/01± 0/003 g/L) آنها مورد ارزیابی قرار گرفت.

کلید واژه: بیوشیمی سرم، خون ،ماهی کپور

Abstract

The common carp (Cyprinus carpio), has great commercial importance because it is the most common fish that is widely consumed worldwide. Knowledge of the blood biochemical parameters of this animal would be helpful for evaluations of their health. In this regard, the serum biochemical values were measured in 60 common carp (of either sex). Serum values of glucose (GLC; 0.42 ± 0.015 g/L), cholesterol (CHL; 1.7± 0.07g/L), total protein (TOP; 33.2±0.6 g/L), albumin (ALB; 15.1±1.5g/L), creatinine (CRT; 0.035±0.002 g/L),urea 0.04±0.002g/L, lactate dehydrogenase (LDH; 115.2±8.22 U/L), aspartate transaminase (AST;48.2±3.6 U/L), alanine transaminase (ALT;21.2±3.6 U/L), triglyceride (TRG; 1.01± 0.1g/L , alkaline phosphatase (ALP;37.2± 5.5 IU/L) and uric acid (UA;0.01± 0.003 g/L)were determined respectively.

Key words: Blood, Cyprinus carpio (Common carp), Serum Biochemistry

Abbreviations

GLC: glucose,CHL: cholesterol,TOP: total protein, ALB: albumin,CRT: creatinine, LDH: lactate dehydrogenase , AST: aspartate transaminase , ALT: alanine transaminase

, TRG: triglyceride, ALP:alkaline phosphatase, UA: uric acid

Introduction

The common carp [Cyprinus carpio Linnaeus (1758)] is perhaps the best known fish in the world. This is due partly to a long history of domestication and worldwide introductions that have resulted in numerous locally adapted wild and cultured. It has been one of the oldest domesticated species of fish for food. Culture of carp in China dates back to at least the 5th century

BC, although domestication began much later (Komen 1990).

Among the diseases of fish, alterations of blood parameters have not been reported completely. The analysis of blood parameters is one of the most valuable modern methods because it has shown that their physiological values are species-specific (Anver Celik 2004; Asadi et al. 2006).The aim of the present study was to determine the serum values of glucose (GLC), cholesterol (CHL), total protein (TOP), albumin

(ALB) L, creatinine (CRT),urea , lactate dehydrogenase (LDH), aspartate transaminase (AST),Alanine transaminase (ALT), triglyceride (TRG) , alkaline phosphatase (ALP) and uric acid (UA) in these fish.

Materials and methods

Sixty apparently healthy carp, of either sex and body weight 60-80g, were obtained from the north of Iran, Khazar, and kept in the closed conditions for at least one week before experimentation during the last December 2011.To ensure the health of fish, parasites and bacteria in a number of them has done. The fish were fed normal diet. But to reduce possible dietary influence on metabolic status,fish were not fed on the day before blood collection (Kiffer and Tufts 1998; Baker et al. 2005). They were kept in water 20 ± 2 ° C temperature , oxygen 5-6 ppm and pH = 7 ±0.5.

Fish were anesthetized in diluted (Finquel^{R},Tricaine methanesulfonate)MS-222. Blood samples were taken in heparinized tubes for the indicated biochemical determinations. In all sera samples, the values of GLC, CHL, TOP, ALB, CRT, urea, LDH, AST,ALT, TRG, ALP and UA were measured. TOP concentration was measured based on the biuret method, a formation of a violet complexing between cupric ions and protein (Silverman and Christenson, 1995). ALB concentration was determined using a dye-binding technique between ALB and bromocresol green, which results in a colored complex (Rothwell et al., 1976).GLC concentration was measured using glucose oxidize p-aminophenazone method. Urea concentration was measured by means of the diacetylmonoxime reagent and converted thereafter to BUN by timing at 0.467(Dawson 1990). CRT concentrations were measured based on the Joffe reaction, which is a colorimetric reaction between CRT and alkaline picrate (Palm and Lundblad, 2005). AST and ALT activities were measured by the direct combination of oxalacetic acid with dinitrophenyl hydrazine and measurement of the color in an alkaline solution (Anver CE, 2004). Uric acid levels were determined by uricase method (Christopher 1999). All reagents were prepared by diagnostic kits biochemical company as Pars Azmun(Tehran, Iran).

Results and Discussion

The values of different routine serum biochemical parameters in common carp have been shown in Table 1 (as mean±SD).

Table1:Serum parameters of common carp (Cyprinus carpio).Values are expressed as mean ± SD

Weight(gr)	70± 15
GLC(g/L)	0.42 ± 0.015
CHL(g/L)	1.7± 0.07
TOP(g/L)	33.2±0.6
ALB (g/L)	15.1±1.5
CRT(g/L)	0.035±0.002
Urea(g/L)	0.04±0.002
LDH(IU/L)	115.2±8.22
AST (IU/L)	48.2±3.6
ALT(IU/L)	21.2±3.6
TRG(g/L)	1.01±0.1
ALP(IU/L)	37.2±5.5
UA(IU/L)	0.01±0.003

Numerous studies have shown that factors such as age, sex, environmental conditions and diet can influence fish blood values. However, Sakomoto et al. (2001) have proposed that variations in blood parameters among fish could be affected by other variables such as the sampling technique, the capturing method, the condition of captivity and the analysis techniques. Therefore, it will be necessary to investigate these parameters in future researches.

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