

Effect of LAS on Plasma Parameters of *Oncorhynchus mykiss*

LAS'ın Alabalık (*Oncorhynchus mykiss*) Plazma Değerleri Üzerindeki Etkisi

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Abstract: In this work the influence of LAS was investigated on plasma parameters of *Oncorhynchus mykiss*.

The values of GPT, ALP, VLDL, triglyceride, cholesterol, total bilirubin creatinine, albumin, total protein, uric acid and urea increased but GOT and glucose largely decreased in 7 days after addition of LAS.

Keywords: LAS, plasma parameters.

Introduction

LAS is an anionic detergent. It has the common property of lowering the surface tension of aqueous solutions. There is no relation between surface tension-lowering ability and damage of organisms. The mechanism of damage is not clear.

LAS is an important pollutant of rivers and seas. The toxicity of LAS on fish and rainbow trout (*Oncorhynchus mykiss*) was studied by various authors (Abel and Skidmore, 1974; Calamari and Marcetti, 1973; Grand and Mehrle, 1973; Tsai and McKee, 1978; Ludwig and Sekaran, 1988; Gupta *et al.*, 1989; Kimerle, 1989; Koç and Güven, unpublished data).

The alkylbenzene sulfonates are readily absorbed across the intestinal tract of mammals (Black and Howes; 1980). Comotto *et al.* (1977) reported the muscle tissue of fish in water containing 0.5 ppm LAS contained 20 µg for an intake of 3 mg LAS day⁻¹ (150 g fish day⁻¹). The World Health Organization have set a maximum limit of methylene blue active substances (MBAS) (anionics) of 0.5 ppm in drinking water.

Surfactant affects blood, destroys red blood cells and renders permeable to the hemoglobin within the cell (hemolysis) (Schwartz, Perry and Berch; 1958). Many enzymes exist in multiple forms in fish. The blood enzymes of *Oncorhynchus mykiss* as GOT (Glutamic oxal acetic transaminase) and GPT (Glutamic pyruvic transaminase) values were determined in culture medium and in sea adapted fish in Beykoz (Bosphorus) (Bulum and Mengi, 1993).

In this work were investigated the effects of LAS on plasma parameters of *Oncorhynchus mykiss*.

Materials and Methods

Oncorhynchus mykiss (Richardson) were obtained from Bozüyük farm, maintained, aerated and kept in 240 L glass aquarium in dechlorinated Istanbul city tap water. The number of tested fish is 6. Fish was taken from this medium after 7 days. All experiments were conducted in an 18°C temperature. LAS was added in aquarium in a concentration of 12.5mg/L.

Blood sample of fish was obtained from caudal vena in tube and analysed for whole blood glucose, enzymes (GOT, GPT, ALP) and creatinine, total protein, albumin, cholesterol, VLDL, triglyceride, uric acid, total bilirubin, urea.

Apparatus: Hitachi 717.

Plasma parameters and analysis methods are:

GOT: Optimized UV-test according to IFCC.

GPT (Alat) FC: Optimized UV-test according to IFCC.
 ALP: Alkaline phosphatase FS optimized standard method according to DGKC.
 Glucose: Diasys. Enzymatic Colorimetric GOD method.
 Urea: Enzyme urease method.
 Creatinine: Jaffe Method.
 Albumin: PSI (Diasys).
 CPK : Bioclinic.
 Cholesterol: Diasys.
 Triglyceride: Biosystems.
 HDL: Diasys.
 Amilase: Enzymatic-colorimetric.
 Uric acid: Diasys.
 Total bilirubin: colorimetric.
 Direct bilirubin: colorimetric.
 Calcium: o-cresol phtalein complexon.
 Phosphore: Diasys. UV-test molybdate.

Results and Discussion

Table 1 shows the plasma parameters of *Oncorhynchus mykiss* in medium added LAS and without LAS as control.

Plasma parameter	unit	LAS omitted	LAS added
glucose	mg/dl	92	41
urea	mg/dl	5	6
creatinine	mg/dl	0.36	0.51
total protein	g/dl	4.3	4.9
albumin	g/dl	2.2	2.8
calcium	mg/dl	12.46	13.21
phosphore	mg/dl	16.1	20.8
cholesterol	mg/dl	192	258
triglyceride	mg/dl	100	201
GOT	U/l	720	96
GPT	U/l	38	146
ALP	U/l	21	164
uric acid	mg/dl	0.8	1.2
total bilirubin	mg/dl	0.27	0.85
VLDL	mg/dl	20	40

Table 1 Analyses in serum sample of *Oncorhynchus mykiss*

GOT-Glutamic oxal acetic transaminase

GPT-Glutamic pyruvic transaminase

ALP-Alcaline phosphatase

VLDL-Very low density of lipoprotein

Bulum and Mengi (1993) found for culture rainbow trout, GOT value 75.24 IU/L and GPT 17.72 IU/L and for sea adapted fish GOT value 233.64 IU/L and GPT 24.26 IU/L . In the present study GOT value showed significantly high. This is not in accordance with finding of Bulum and Mengi (1993). GPT, ALP, VLDL, triglyceride, cholesterol, total bilirubin creatinine, albumin, total protein, uric acid and urea values increased in LAS added aquarium. The values increased 2 fold for VLDL and triglyceride and decreased 2 fold for glucose and 7 fold for GOT.

Özet

Bu çalışmada alabalık plazma değerleri üzerine LAS'ın etkisi incelendi. Akvaryuma kloru giderilmiş ve havalandırma tertibatı olan su içinde alabalık üzerine LAS ilave edildi ve 7 gün sonra alabalığın kuyruk venasından kan alındı ve analiz edildi. Bunun sonunda plazmada GPT, ALP, VLDL, trigliserit, kolesterol, total bilirubin, kreatinin, albumin, total protein, ürik asit ve üre miktarının arttığı, fakat GOT ve glukoz miktarının düştüğü saptanmıştır.

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