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Effect of alloxan mixed diet on proximate aspects and its management by silkworm pupae meal diet in fish (Common carp)

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Abstract- **Present study Alloxan is a well-known and universally used agent for evoking experimental insulin dependent diabetes through its toxic effect on the Beta cells of the pancreas. Medical science has discovered how sensitive the insulin receptor sites are to chemical poisoning. This paper presents a brief overview on the entry of alloxan into foods and its fatal link to diabetes. In the silkworm pupae meal diet as on management to Alloxan induced diabetic fishes secluded the fish from the changes induced alloxan in proximate composition. The increase in the levels of alloxan affect of proximate is a sign of succession in diabetes. The Supplementation of silkworm pupae meal diet 40% management alloxan to almost normal by demonstrating anti-hypoglycemic and anti-lipidemic properties. The reduction in alloxan diabetic fish can be used as a marker in the evaluating the severity of diabetes.**

Keywords: Silkworm pupae meal, Alloxan, protein, carbohydrate and lipid,glycogen, etc.

I. INTRODUCTION

Maida or refine wheat flour is the “heart” of the ingredients in making of the multi various baked goods globally. It is also used to the fish pellet feed using as binding materials. Alloxan is an oxygenated pyrimidine derivative which is present as alloxan hydrate in aqueous solution. Alloxan was discovered by von Liebig and Wohler in 1828 and has been regarded as one of the oldest named organic compounds that exist. In diabetes, this causes the level of glucose in the blood to be too high. Alloxan is one of the usual substances which is a toxic glucose analogue. It is stable in dry form, but is easily oxidized and selectively destroys insulin-producing cells in the solution in the presence of air. Oxidation is accelerated by pancreas when administered to rodents and many other heat, light, alkalis and traces of copper and iron. This causes an insulin-dependent acid is a molecule composed of six carbon atoms, six diabetes mellitus (called "Alloxan Diabetes") in these oxygen atoms and eight hydrogen atoms, all linked animals, with characteristics similar to type I diabetes in together by chemical bonds (Ankur Rohilla,shahjad ali.,2012 and Federiuk et al,2004).

India has more than 40 million diabetic individuals which represents nearly 20% of total diabetes population worldwide. DM affects approximately 4% of the population worldwide and is expected to increase by 5.4% in 2025. A number of currently existing anti-diabetic agents have number of unfavorable effects on the body. Therefore, regulation of diabetes without any side effects is still a difficult task for health care researchers. Consequently, the exploration for more successful and safer hypoglycemic agents with lesser side effects has unremitting to be a momentous area of study. Much diabetes related metabolic alterations are reported.

MATERIALS AND MATHOD

Biochemical parameters like proteins, lipids and carbohydrates were estimated by following standard methods The amount of protein in the sample was estimated by (Lowry et al., 1951) Carbohydrate content was estimated by (Anthrone .,1955) and lipid was estimated by (Bragdon .,1951).

EXPERIMENTAL DESIGN

Five series of experiments were conducted to investigate the induced alloxan on biochemical composition the tank contain 0,0.01,0.1,1.0,10mg alloxan mixed diet . In 8th series of experiments, utilization of 0,0.01,0.1,1.0, 10mg alloxan with 40% Silkworm pupae meal diets on the reduction of alloxan toxicity on proximate composition was estimated (Fig. 1).

RESULTS

The proximate composition content in control fish was gradually increased with an increasing of time in tested tissues of L.rohita; however, The decline of proximate composition was concentrations dependent (Fig.6.1). Proximate composition protein content of control fish was 7.58 mg g-1 wet tissue and it declined to 5.96, 4.67, 4.60 and 4.32 mg g-1 wet tissue in fish exposed to 0.01, 0.1, 1 and 10mg alloxan respectively on day 60. Similar trend was obtained in carbohydrate and lipid also. There was about 1.12, 1.15, 1.26, 1.36 and 1.47% 0.88, 0.76, 0.63, 0.56, 0.43 decrease of glycogen content in liver, respectively in fish exposed to highest alloxan concentration as compared to control fish on day 60. Muscle contained more quantum of protein. reduced the protein content in different tissues of L. rohita and it was more pronounced in fish exposed to 10mg alloxan (Table 1; Fig1). Similar trend was obtained in carbohydrate and lipid also (Table 1; Figs. 1). Liver contained more quantum. Increased the glycogen 60.77, 62.25, 65.16, and 70.24 mg g-

1 wet tissue in liver in fish exposed to 0.01, 0.1, 1 and 10mg alloxan respectively on 60 day.

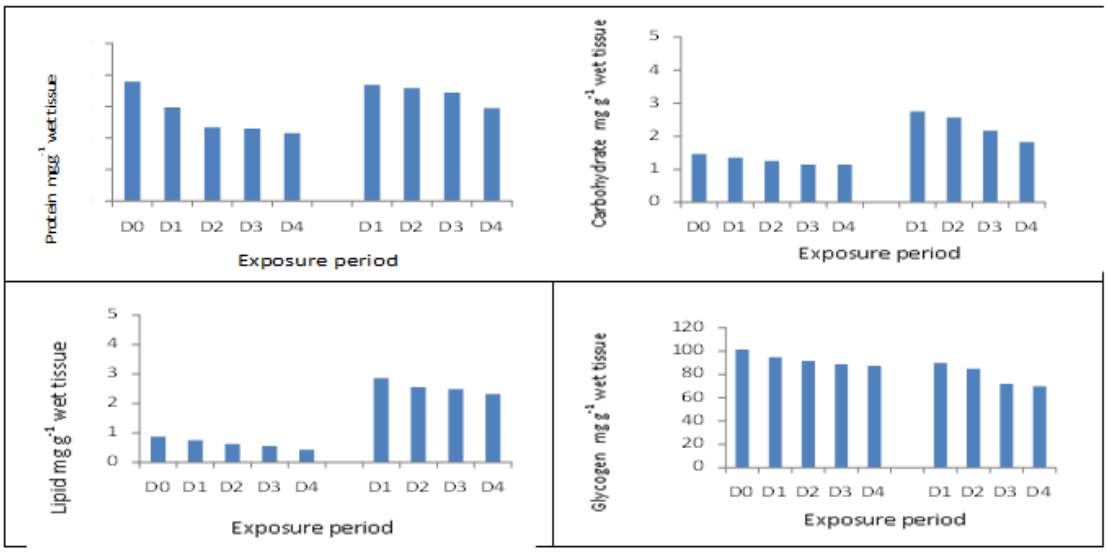

Fig1 Effect of silkworm pupae meal diet on proximate composition in alloxan exposed labeo rohita on 60 day.

TABLE1 Effects of silkworm pupae meal diets on proximate composition in alloxan exposed carp, Labeo rohita as a function of time. Each value is the mean of three estimations

Protein									
Rearing	**D0**	**D1**	**D2**	**D3**	**D4**	**D1**	**D2**	**D3**	**D4**
0	6.76 ± 0.28	6.76 ± 0.28	6.76 ± 0.28	6.76 ± 0.28	6.76 ± 0.28	6.76 ± 0.28	6.76 ± 0.28	6.76 ± 0.28	6.76 ± 0.28
20	7.29 ± 0.36	7.86 ± 0.27	7.93 ± 0.36	7.30 ± 0.36	6.96 ± 0.22	5.88 ± 0.25	5.74 ± 0.23	5.60 ± 0.28	5.38 ± 0.10
40	7.43 ± 0.69	6.02 ± 0.60	5.81 ± 0.58	5.74 ± 0.43	5.52 ± 0.27	6.45 ± 0.16	6.09 ± 0.20	6.24 ± 0.69	5.52 ± 0.18
60	7.58 ± 0.87	5.96 ± 0.39	4.67 ± 0.63	4.60 ± 0.26	4.32 ± 0.29	7.37 ± 0.17	7.16 ± 0.42	6.87 ± 0.19	5.89 ± 0.26
Carbohydrate									
0	1.54 ± 0.06	1.54 ± 0.36	1.54 ± 0.26	1.54 ± 0.26	1.54 ± 0.26	1.54 ± 0.26	1.54 ± 0.26	1.54 ± 0.6	1.54 ± 0.26
20	1.89 ± 0.04	2.03 ± 0.28	2.15 ± 0.34	2.18 ± 0.24	2.27 ± 0.24	2.12 ± 0.14	2.12 ± 0.18	2.03 ± 0.24	1.77 ± 0.14
40	1.65 ± 0.04	1.77 ± 0.27	1.83 ± 0.48	1.87 ± 0.23	1.92 ± 0.14	2.31 ± 0.19	2.37 ± 0.14	2.43 ± 0.23	1.62 ± 0.15
60	1.12 ± 0.04	1.15 ± 0.24	1.26 ± 0.53	1.36 ± 0.16	1.47 ± 0.22	2.75 ± 0.21	2.18 ± 0.19	2.57 ± 0.14	1.83 ± 0.22
Lipid									
0	0.13 ± 0.04	0.13 ± 0.04	0.13 ± 0.04	0.13 ± 0.04	0.13 ± 0.04	0.13 ± 0.04	0.13 ± 0.04	0.13± 0.04	0.13 ± 0.04
20	0.18 ± 0.08	0.20 ± 0.06	0.25 ± 0.06	0.26 ± 0.05	0.30 ± 0.07	1.71 ± 0.16	1.23 ± 0.12	1.46 ± 0.12	1.26 ± 0.34
40	0.31 ± 0.06	0.36 ± 0.03	0.35 ± 0.08	0.43 ± 0.07	0.48 ± 0.08	1.86 ± 0.18	1.61 ± 0.16	1.49 ± 0.13	1.29 ± 0.12

60	0.43 ± 0.09	0.56 ± 0.08	0.63 ± 0.09	0.76 ± 0.06	0.88 ± 0.02	2.33 ± 0.12	2.49 ± 0.12	2.56 ± 0.22	2.86 ± 0.32
glycogen in liver									
0	38.26 ± 3.12	38.26 ± 1.12	38.26 ± 1.12	38.26 ± 1.12	38.26 ± 1.12	38.26 ± 1.12	38.26 ± 1.12	38.26± 1.12	38.26 ± 1.12
20	44.63 ± 1.28	48.30 ± 2.45	51.67 ± 1.65	58.52 ± 2.23	64.40 ± 2.64	78.44 ± 2.25	98.16 ± 1.04	82.17 ± 5.54	94.38 ± 3.18
40	73.65 ± 2.37	77.61 ± 1.48	81.03 ± 2.61	83.27 ± 2.91	88.63 ± 1.93	72.68 ± 2.36	72.65 ± 2.05	78.55 ± 3.42	82.16 ± 2.55
60	87.26 ± 1.53	88.63 ± 1.93	91.63 ± 4.05	94.65 ± 3.86	101.31 ± 2.60	60.77 ± 3.18	60.25 ± 2.02	65.16 ± 2.32	70.24 ± 3.52

DISCUSSION

Results of present study shows the levels of the proximate composition changes in Common carp fed with different levels of alloxan incorporated diet. In the proximate composition, the protein content of muscle gradually decreased with increasing levels of alloxan carbohydrate levels also increased. These results are in agreement with the increasing levels of alloxan diets. These results are in agreement with those obtained by Nayeemunnisha ahmed 2009 who reported that protein content was significantly increased in the cerebrum of rats in diabetic animals compared with the control. In common carp increasing level of alloxan decrease proximate composition Similarly Kim et al 2005 reported that in diabetes mellitus induced rats by alloxan and steptozotocin, the protein expression, the protein expression was increased compared with the controls. In contrasts to the present study Young Heechoi et al 2008 started that in DMIA rats the total protein in the liver microsomes was significantly lower than the control animals. According to Nayeemunnisha ahmed 2009 an increased lipid peroxidation during diabetes in rats. Maqsood Ahmed et al 2008 the blood glucose concentration of diabetic rabbits increased significantly compared to the control. Similarly Nayeemunnisha Ahmed 2009 reported that diabetes caused significant increase in the level of blood glucose

CONCLUSION

The administration of silkworm pupae meal might be beneficial for the restoration of biochemical parameters, in the present study have revealed that incorporate silkworm pupae meal diet reduced proximate composition plasma enzymes and liver function parameters in Alloxan induced hyperglycemia in labeo rohita. On the other hand Alloxan-induced diabetes could increase the liver enzyme levels. The increase in these enzymes may occur due to peroxidation reactions, arising from Alloxan biotransformation during diabetes and these reactions may inflict oxidative injury to cellular components. Our data shows that the silkworm is a good edible resource of natural Silkworm pupae meal diet with hypoglycemic activity.

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