

Environmental Protection: Role Of Immunostimulants, Immunex Ds And H-Treat On The Immune Response Of Labeo Rohita During Aeromoniasis.

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Abstract: In aquaculture practices, a growing concern for high consumption of antibiotics initiated a search for alternative methods of disease prevention. Improved resistance against infectious diseases can be achieved by the use of immunostimulants. The objective of present study was to evaluate the effect of immunostimulants, Immunex Ds and H-treat on serological parameters like serum protein and IJM in *Labeo rohita* during aeromoniasis. These immunostimulants have beneficial activities like antistress, appetizer and antimicrobial. Moreover, they are cheaper and safer non-toxic, biodegradable and biocompatible. Marked changes were observed in all treated fish compared to controls and fish which received only infection.

Keywords: aeromoniasis, biocompatible, biodegradable, immunostimulants, immunex Ds, *Labeo rohita*

I. INTRODUCTION

The intensive aquaculture practices have expanded extensively in understanding fish diseases, so that they can be treated and/or prevented by using antibiotics. But they created many problems with drug resisting bacteria, toxic effects and accumulation both in fish and environment. So, there is a need to alter them with eco friendly disease prevents measures to promote sustainable environment for fish culture. There are studies on the inclusion of plant deserved materials or whole plants. Immunostimulants are the alternatives to vaccination and antibiotics. Immunotherapy is an approach that has been actively investigated in recent years as a method for disease prevention to improve fish health and reduce the losses by disease and other stress factors. It does not involve recognition of a specific antigen but causes an overall immune response that hastens recognition of foreign proteins. Efficiency of dieting doses of *Wothania somnifera* (L. Dunal) on immunological parameters and disease resistance to *A. hydrophilla* were immersed *L.rohita* (Hamilton) fingerlings (Arun Sharma et.al, 2010). The enchantment of immune system and resistance to *A. hydrophilla* in common carp (*Cyprinus carpio*) supplemented with plant extracts were mixed. Since, use of immunostimulants in Indian carps is an active area of research, an attempt was made to evaluate the effect of Immunex Ds and H-Treat in immunity in *L. rohita* during aeromoniasis.

II. Materials And Methods

Blood samples were collected from day 1 to 5 and tested for serum proteins following Biuret method and IgM according to the protocol given by Fish Immunoglobulin M(IgM) ELISA KIT (catalog No:CSB-E12045 ph). Blood was collected by caudal cut method and serum was separated following standard procedures.

III. RESULTS

Serum protein and IgM activity in Table.1

The fish treated with Immunex DS (40 mg/100 gm of feed) and infected with *A. liquefaciens* (10^{-5} CFU/fish) (group B) showed higher activity of serum protein on day 1 (2.84 gm/dl) and 2 (3.13 gm/dl) in comparison with control (2.71 gm/dl). The IgM levels are also showed higher activity in group A and group B

Serum protein and IgM activity in Table.1

The fish treated with H Treat (40 mg/100 gm of feed) and infected with *A. liquefaciens* (10^{-5} CFU/fish) (group b) showed higher activity of serum protein on day 1 (3.23 gm/dl) and 2 (3.52 gm/dl) in comparison with control (2.71 gm/dl). The IgM levels are also showed higher activity in group a and group b in comparison with control group.

IV. FIGURES AND TABLES

Table – 1: Serum protein (gm/dl), and Antibody level IgM (µg/ml) of control (group C, untreated and uninfected), treated (group A, treated with Immunex DS 40mg/100gm of feed) and infected (group B, infected with *A. liquefaciens* 10⁻⁵ CFU/fish) fish, *L. rohita* at different days of experiment. Values are expressed in mean derived from five observations.

Days of Necropsy	Experimental groups				Control group	
	Treated with H-Treat (group a)		Infected with <i>A. liquefaciens</i> @ 10 ⁻⁵ CFU/fish (group b)		Uninfected and untreated (group c)	
	Protein (gm/dl)	Antibody IgM (µg/ml)	Protein (gm/dl)	Antibody IgM (µg/ml)	Protein (gm/dl)	Antibody IgM (µg/ml)
1	3.23	4.87	2.62	3.74	2.71	3.63
2	3.52	4.85	2.59	3.74	2.71	3.65
3	3.94	4.99	2.59	4.10	2.70	3.70
4	3.78	5.05	2.55	4.56	2.70	3.72
5	4.45	5.22	2.42	4.90	2.70	3.71

Days of Necropsy	Experimental groups				Control group	
	Treated with Immunex Ds (group A)		Infected with <i>A. liquefaciens</i> @ 10 ⁻⁵ CFU/fish (group B)		Uninfected and untreated (group C)	
	Protein (gm/dl)	Antibody IgM (µg/ml)	Protein (gm/dl)	Antibody IgM (µg/ml)	Protein (gm/dl)	Antibody IgM(µg/ml)
1	2.84	3.75	2.62	3.74	2.71	3.63
2	3.13	3.71	2.59	3.74	2.70	3.65
3	3.75	4.02	2.59	4.12	2.70	3.72
4	3.75	4.33	2.56	4.54	2.71	3.70
5	3.82	4.71	2.43	4.90	2.70	3.71

Table – 2: Serum protein (gm/dl), Antibody level IgM (µg/ml) of control (group c, untreated and uninfected), treated (group a, treated with H-Treat (40 mg/100gm of feed)) and infected (group b, infected with *A. liquefaciens* 10⁻⁵ CFU/fish) fish, *Labeo rohita* at different days of experiment. Values are expressed in mean derived from five observations.

V. CONCLUSION

Both innate and acquired specific defense mechanisms exist in fish and the fish contain naturally occurring agglutinins ; these molecules, usually proteins or glycoproteins are often called antibodies (which may react to a wide variety of cellular antigens) and may confer immunity against infection. In case of infected fish (groups B and E), the level of serum proteins decreased and IgM increased significantly due to the pathogenic action of bacteria. In case of IDs and H-Treat treated fish, the level of serum proteins increased and IgM decreased significantly. These observations are in agreement with that of Cuesta et.al (2004) who also found significant increase of IgM levels in serum in fish fed on immunostimulant supplemented diets (levamisole). Magnodottir and Gudmunds dottir (1992) reported that total immunoglobulin levels in healthy Atlantic salmon increased due to the exposure of *Aeromonas salmonicida* species. The elevated total IgM concentration in infected fish, fish could reflect the effect of infective dose they have required Davis et.al (1991) also found increased IgM in infected could reflect the chronic exposure to *I. hoferi* antigens in *C. pallasii*. In our study, the proportion of serum protein and IgM elevator due to infection was determined.

The result of serum protein in fish fed with IDs and H-Treat are similar to Ahmed et. al (2011) increased the efficiency if dietary nucleotides on growth, histopathological parameters, serum proteins and serum enzymes during acute stress condition in rainbow trout and found increased percentage of body weight and decreased levels of serum enzymes and suggested that dietary administration promotes growth and enhances resistance against handling and crowding stress. The activity of IgM showed significant increase in fish (group B and b) infected with 10⁵ cfu/fish when compared with the control group. This indicates that the infective dose of *A. liquefacines* triggered the pathological/immune reactants to release antibodies into the serum of the host (fish).

The present study showed that both Immunex Ds and H- Treated are able to enhance the immune system of carp even under infection stress; but further studies are needed to find out the immunostimulatory effect of Immunex Ds and H- Treat in rohu in different conditions and different age groups.

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