

RESEARCH OF SERUM AMYLOID A AND TRANSFERRIN LEVELS FOLLOWED AFTER *STREPTOCOCCUS INIAE*- INFECTED IN TILAPIA (*OREOCHROMIS NILOTICUS*)

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Abstract

Streptococcus iniae is an important bacterial pathogen of fish, causing up to 50% mortality in stocks, which has recently been associated with human infections. Some disease states are associated with, or are causally related to acute phase proteins (APPs). Acute phase responses (APRs) to *S. iniae* (ATCC 29178) were characterized in plasma of tilapia following intraperitoneal (i.p.) infection. Two experimental groups, including *S.iniae*-infected and *S.iniae*-infected+handling stress, with a group of nonstressed control fish, were examined. Samples for plasma analysis were utilized to analyze serum amyloid A (SAA) and transferrin (Tf). The diseases signs observed in tilapia were erratic, slowdown in fish motions and darkened skin. SAA and Tf has been reported to decrease in acute phase plasma.

Keywords: *Bacteria, Diseases, Fish Behaviour*

Introduction

Streptococcus spp. have been recently listed among the emerging problems in aquaculture. Fish farms in many parts of the world have suffered serious economic losses due to this bacterial pathogen. For fish populations, many parameters (factors) have been measured as biomarkers. APPs that is one of them are plasma or serum proteins whose levels change in response to tissue damage, infection, or inflammation (Gaby and Kushner, 1999). APPs are an established diagnostic tool as early indicators of inflammation and disease. Recently, studies have showed significant diagnostic informations in prognosis and fixing of diseases of APPs concentration levels in plasma [2].

Materials ve Methods

Tilapia (mean 60 g) were acclimated in the experimental ponds for 1 month prior to experiments. The fish were fed with carp feed at 2–3% body weight daily. For each treatment, there were triplicates and each pond was stocked with 5 fish (72 fish in total). Tilapias were injected intraperitoneally (i.p.) of *S. iniae* (ATCC-29178) obtained from Deutsche Sammlung Von Microorganismen Zellkulturna GmbH (DSMZ). In first group, tilapias were susceptible to 3.3×10^5 (sublethal dose) *S. iniae* colony forming units (CFU). The second group were exposed to both *S. iniae*-infection and handling stress for 15 minutes additionally. The last group was the control group. The fish were sampled on the 0, 7th, 14th and 21st day after the end of the challenge trial. Samples for plasma analysis were collected from caudal venepuncture of infected fish. Serum SAA was measured using the N-high sensitivity CRP assay with latex-enhanced immunonephelometry assay on a BN II analyzer (Dade Behring, Milan, Italy). Transferrin were analyzed by Roche/Hitachi 902 machine used immunoturbidimetric immune assay with Randox (Kat. no: TF 7197). T-test (Independent samples) and Mann-Whitney test and Student's t were used for statistic analyses.

Results and Discussion

Macroscopic diagnosis obtained darkening of the skin, untidiness in fish motions and slowing down, immobility in pool edges were the first signs observed in tilapia. In microscopic datas, haemorrhages were observed on the ventral side of the body, lesions and hyperemiae in skin. Dermal hemorrhages on the body surface and around the mouth, opercles, base of fins and anus [3] have been observed in *S. iniae* infected moribund tilapia. These observations are often assumed to be identical to those that occur from *S. iniae* infections. While SAA levels increased in the first and second week, it decreased at the last of the third week. In contrast to SAA, a contrary situation was followed in transferrin levels of the same weeks. Jensen et al (1997) were examined changes in APPs in salmonids. In this study, fish were injected with live *A. Salmonicida*. Increases in SAA levels has been determined. Transferrin levels, for both group of the first week, were occurred decreased but following weeks its level reached to control levels. Determination of APPs can help in monitoring health of individual subjects.

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