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**EVALUATION OF THE AMOUNT OF INFECTIONS TO NEPHROCALCINOSIS  
USING HISTOPATHOLOGICAL SIGNS OF DISEASE, AMONG SALMONS OF  
RAINBOW TROUT IN QADIR FARM OF NOOR ABAD MAMASANI OF FARS  
PROVINCE**

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**ABSTRACT**

Today the fish specially types of protein such as salmon specify an important share of economic and animal protein sources in lots of countries. Rainbow salmon is rapidly developing all over Iran too. The reviews stated that mineral deposits commonly within the tubules, ducts and ureters urinary excretion of the month, both in farmed and wild fish happen and they call this nephrocalcinosis (calcium deposits in the kidneys). According to the economic importance of such fish the investigation on outbreak of nephrocalcinosis among rainbow salmon is the most major subject of present study. Study was designed to investigate on outbreak of nephrocalcinosis among rainbow salmon in Qadir field of Noorabad Mamasani of Fars Province on 2010 samples were taken from the field and 75

samples were chosen randomly. After spinal cord injury, biometry and then necropsy was performed to obtain a sample of kidney tissue. All samples preserved in 4% formalin and then transferred to the pathology laboratory of Veterinary Medicine and acting opioid preparation of pathology slides and staining Hematoxylin - eosin. The sections were examined pathologically. Among the samples, there were no nephrocalcinosis symptoms but a degree of complicated pathology of renal tubular dilation and hyaline casts, acute tubular necrosis and renal pathology was observed to increase melanin in some sections. According to this fact that amount of deaths were low, regarding transition coefficient of nutrition in fishes' food had depletion, the corps of fish were of low quality. Therefore further research is recommended .

**Keywords: Nephrocalcinosis, Histopathologic, Trout, Rainbow, Mamasani**

## INTRODUCTION

Today the fish specially types of protein such as salmon specify an important share of economic and animal protein sources in lots of countries. Rainbow salmon is rapidly developing all over Iran too. Untold science and research, and more research is needed. The rainbow trout *salmo garidneri* perfection is more to be named because of its morphological features of intact and separated by sex and continuous anchoryncous called *O. mykiss*. The name means the male's nose is HOOKED. The growth of a specific member of a hook on the snout of the fish breeding season, and like is created. Duration of different life stages of Pacific salmon, Atlantic salmon are even more stable situation [1-4].

Given the direct connection between symptoms and pathologic losses caused by diseases and different organs, knowing organs can contribute to knowing clinic

symptoms and investigating disease losses such as kidney, cyst and urinal tubes. The kidney has two role of blood filtration (urine production), and is responsible for making blood. It has a long dark structure on the top of abdominal cavity which is stuck to spine and is continued to the rectum. There is a vein crossing through the kidney. Thin-walled bladder is the organ that is located above the anus. The last member of the excretory system is urinary tract and administrative openings [5-8].

Successful breeding of rainbow trout requires serious care and management is desirable. It's important to understand the biological needs of fish depending on Rainbow trout animal consciousness. Education Management should always consider this in your calculations. So you should always take notes on the breeding of rainbow trout kept in mind. Fish should be

placed at risk of hunger or malnutrition. Density and the desired temperature will always be respected, when and where the figure is carefully packed to prevent fish injury or damage. We should avoid the fear and stress and anxiety. Overall, rainbow trout and salmon fish are blue component in the range of 25-0°C heat grow. Above 20 degrees the oxygen decreases and for observing the needs of fish for oxygen, maintain the fish hungry.

Mineral deposits commonly within the tubules, ducts and ureters urinary excretion in both farmed fish and wild fish occur. In this case, nephrocalcinose (calcium deposits in the kidneys) say. Mortality is usually low, but become fish food that is deficient. The main focus of this phenomenon is the decrease in carcass quality. All muscles are also affected in severe cases [9-12].

Two factors as a cause or trigger nephrocalcinosis available firstly to provide long fish on surfaces with high levels of carbon dioxide that higher levels of 15 to 20 milligrams per liter and the second aspect of the nutritional deficiency of magnesium and selenium and toxicity selenium (ie excessive dietary selenium) It also is required. Fish that have high levels of dietary selenium are also weight loss and mortality rate is very high. Hematocrit, plasma calcium, glucose and protein levels do not change dramatically In addition, large cysts may be

associated with the presence of nephrocalcinosis, urinary form large cysts urine that is associated with swelling of the posterior fossa tubular kidney tissue Correction is gone and fibromyalgia. Kidney is the original filter in body .

## **MATERIALS AND METHODS**

Samples was taken from fish field in Mamasani with 3 hectare space which has 55 porch pools and 10 ordinary poos. the water is provided from Tasak spring which is near there and anal production of it is about 50 tons. The complex has been constructed in 2008 . Study on field measurements of water temperature and pH Qadir Sheikhs started and the results were recorded. Fish sampling was done randomly. 75 fish were caught by a hand tool. To study organ structure, small pieces of 2-1 cm is required resection of small pieces of tissue sampling are called sample pieces. Sampling is done in two types :

One type is sampling from living fish which is called biopsy which is done using especial needles.

### **Kidney Specimens Were Collected in this Way**

First the area under the fish's body (abdomen) is cut. The cut starts from near the gills and continue to be in close proximity to the rectum. We should cut carefully and maintain the dull side of scissor to the body side not to cut the other

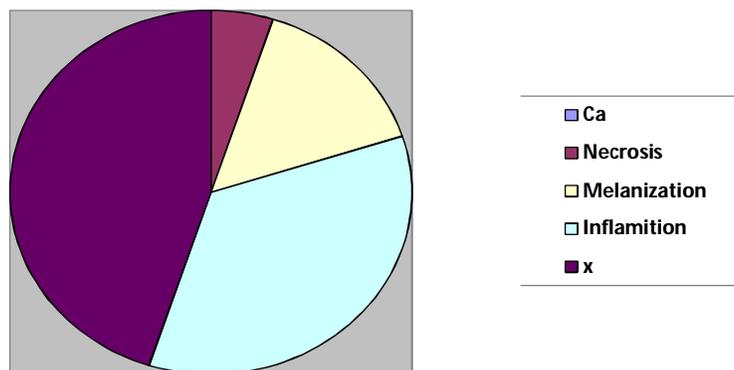
organs. After that we open the fish body to see all its inner organs. Kidney is at the lower level of the spin of Fish and sticking to it and pulled the dark part is visible. Then with a plastic spoon we cut it and put it in a container of 4% formalin. In the present study 75 samples tissues of 2\*2 cm were collected from all parts of field pools. Tissue samples were sent to laboratory of Veterinary Medicine Kazeroon to provide histopathology sections.

**RESULTS**

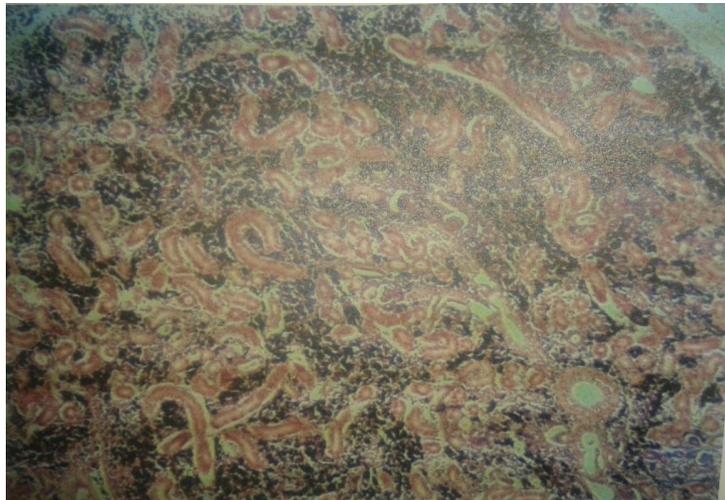
After investigating pathologic slides we found no sign of nephrocalcinosis in pathologic sections which appear like basophilic deposits in colors of hematoxylin-eosin. But same degrees of edema of one core cells, necrosis of urinary tract, hyaline cyst inside the urinary tract and increased melanin pigment in the interstitial space were observed in some sections. In addition, in measurements made in the field ph of water were approximately 7-5/6 and water temperatures between 16-18 have been variable.

**Table1: Loss Types in Pathologic Samples**

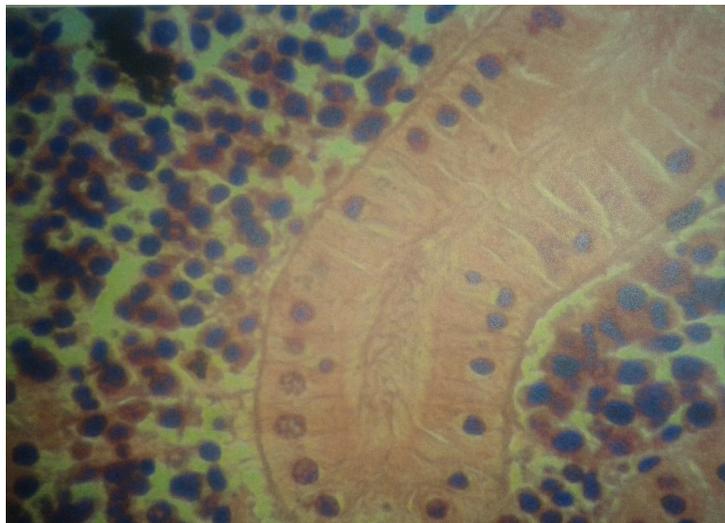
	Calcium deposit	necrotic	melanisation	inflammation	Hyperemia
Percent	0	5	15	35	45



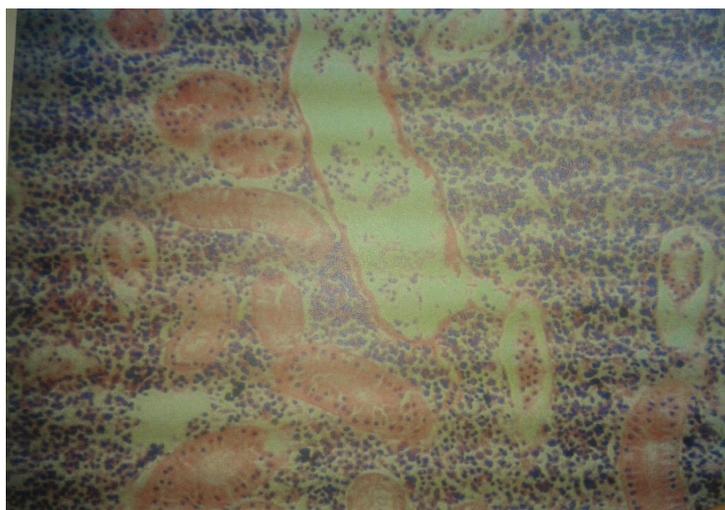
**Diagram 1: Pie Chart of the Amount of Waste in Surgical Pathology Specimens**



**Figure 1: Severe Melanin Accumulation in Kidney Tissue**



**Figure 2: Inflammatory Cells in the Interstitial Tissue of the Renal Tubules**



**Figure 3: Renal Tubular Necrosis and Interstitial Tissue**

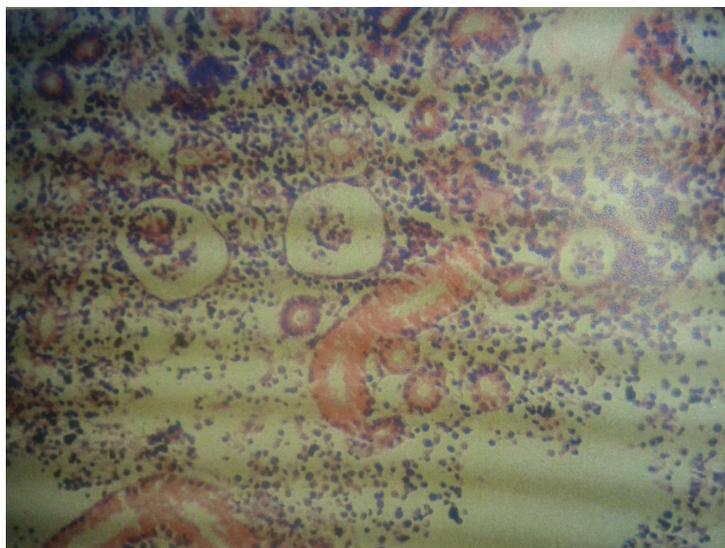


Figure 4: Glomerular Necrosis

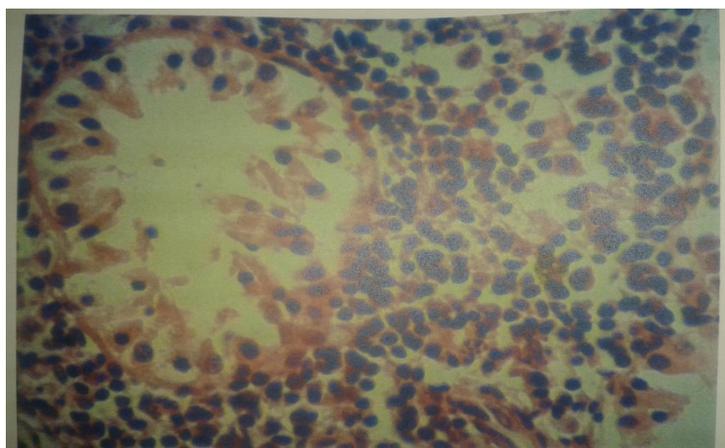


Figure 5: Mononuclear Inflammatory Cells

#### DISCUSSION AND CONCLUSIONS

In recent years along with rapid growth of aquatic industry, need for high number of infants has caused obvious increase in fish density during maintenance in growth containers. This subject was achievable by increasing the oxygen in the water which increases the density of carbon dioxide when the current is decreased and is caused carbon dioxide and ammoniac to increase. Long-term effects of contact between rainbow trout and Smoltz of Atlantic salmon

fresh water with high carbon dioxide can be reduced feed conversion correlation and growth. Also when fish with high levels of carbon dioxide will exposed for a long time, Carbon dioxide levels is risen (hypercapnia) and pH levels can also result in reduced respiratory acidosis and the fish trying to compensate acidosis with elevating levels of plasma bicarbonate and phosphate excretion through the kidneys (nephrocalcinosis). In 2001 [10] in US observed a case of severe nephrocalcinosis in a tilapia fish suffering

from this disease which was sent to a growth system lab to diagnose the causes of death. Losses such as dilated ureter, and renal mineral deposits inside pipes, forming cysts in tubular kidney, ureter epithelium degeneration was also observed in the granuloma forms of the same histopathological findings in nephrocalcinosis Atlantic halibut larvae. In the present study, however we found no trace of the calcified deposits calcium, hyaline cysts in the urine tubes were observed. The mineral deposits in the renal tubular and interstitial tissue, as there were frequent. Capitolar kidney necrosis was observed in most of the tested tilapia. There was also an increase in the number of cells in the kidney glomerulus, the only obvious change observed were mild lipid changes and hepatocytes.

Hyperemia of the kidney tubes were observed in examined fish. During blood factors investigations (sodium, bicarbonate, calcium, phosphate and total protein) that this fish was conducted over several months, the most obvious changes in plasma bicarbonate was included. In a way that the levels of sampled bicarbonate during last month before are sending to lab were about 8 MEq/l. While 3 months later levels of bicarbonate reached to 26 mEq/l. Important data from the history of sample was using calcium carbonate to common range in

aquatic growth to maintain alkali feature of water up to 4 weeks which by stopping the use of sodium carbonate and replacing it with sodium bicarbonate death and causes of nephrocalcinosis were decreased. Although this study also found no calcium deposits in the renal, tubular necrosis was observed in some sections. It seems that these observations may indicate early a stage of the primary pathology is a nephrocalcinosis.

[11] during investigations on nephrocalcinosis between rainbow salmons on effects of co<sub>2</sub> density, they put salmons in water with excess amounts of co<sub>2</sub>, 12mg/l to 60mg/l for 275 days that during this time there was symptoms of nephrocalcinosis. Histology and chemical investigations showed that the outbreak and severity of nephrocalcinosis increases as the density of CO<sub>2</sub> increases. Also [12] have studies on long term lethal effects of carbon dioxide on Atlantic salmon Smoltz on: Adjustable Ionic, hematology, element composition, nephrocalcinosis and growth parameters.

Significant difference were observed between the groups in terms of the average concentration of hemoglobin, hematocrit, or activity of Na<sup>+</sup> + T-k<sup>+</sup>-ATP gill nephrocalcinosis and the content of calcium in the kidneys in response to rising levels of carbon dioxide in water at day 58 was observed in the examined fish 1 Once in the

water there was no symptoms of nephrocalcinosis. The cause of no calcium dispose may relate to low levels of carbon dioxide during life in brine and also may urine pH has reached to natural and deposits has dissolved. Also physiologic actions of kidney in brine are different because actions of sea water generally is focused on magnesium and sulfate spatter. Environment hyperopia may decrease blood capacity to carry oxygen and can cause nephrocalcinosis. The resulting death is not frequent and is clear that this trend is reversible. However, some sediment may be developed and may cause secondary abdominal complications. Magnesium deficiency is also associated with dietary imbalances mineral content. Also sulfamerazine therapy can also be involved in causing the disease.

Keratin is the dominant to keratinin in the fish. keratine is excreted through the kidneys, not through gills, and makes up more than half of the nitrogen in the urine in most fish. keratinin is found in fish and is the effect of non-enzymatic circling of itself. It seems that the found keratinin in muscles is correlated to keratin amount and when it is created, it's not metabolized and is excreted. Also in rainbow trout, serum keratinin nephrocalcinosis disease increases [13-16]. Another type of degeneration of renal tubular epithelium is glycogen

influence. Sometimes so much aggregation of glycogen may be formed in small or big portions of covering tissues of tubes which causes necrosis and gradual damage of covering cells. This change in Carp Seiko disease and administration of alloxan has been reported. In the surveys conducted by [17] amount of developing nephrocalcinosis on 44 rainbow trout in Bayza farm of Fars : in terms of sediment organic matter (nephrocalcinosis) there was nothing found but some degrees of enlargement renal tubular cysts, hyaline, extreme accumulation of melanin, inflammatory cells - congestion - nephrosis and tubular necrosis and renal tissue was observed.

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