

Histopathological Investigation of Edible Muscular Tissues of Carp fish Related to Parishan Lake in Order to Confirm thier Safety in Humans

SADEGHI LIMANJOOB REZA^{1*}, TARAHOMI MOHAMMAD¹, FARZAM MOHSEN², AZHDARI SARA², MOHAMMADI SAHAR³, ROSTAMI ALI¹ and FARZAM MOHAMMAD²

¹Department of Aquatic Animal Health, Veterinary School, Kazerun Branch, Islamic Azad University, Kazerun, Iran.

²Department of Physiology, Veterinary School, Kazerun Branch, Islamic Azad University, Kazerun, Iran.

³Department of clinical Biochemistry, Kermanshah University of Medical Sciences, Kermanshah, Iran

⁴Department of Physiology, Medical School, Kazerun Branch, Islamic Azad University, Kazerun, Iran.

*Corresponding author E-mail: dr.r.s.limanjoob@gmail.com

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ABSTRACT

Damages of the Carp edible muscular tissues are including lesions caused by parasitic, viral, bacterial disease, environmental factors, nutritional effects, poisonings, neo- plastic diseases and also fungal diseases. These lesions in addition to economical losses for the suburbanite of the Parishan Lake, can also threaten the health of human society. So the aim of this study is histopathological investigation of edible muscular tissues of Carp fish of the Parishan Lake, to confirm its health for human society. In this study, 100 pieces of Carp fish (mainly yellow Carp fish) at different weights were caught from Parishan Lake. Fish were initially autopsied. The fixed tissues were dehydrated, became transparent and parafinated and their histological sections were prepared. Those sections were stained by the method of Hematoxylin and Eosin (H & E). Then, they were studied and examined by optical microscope. The results show that in most cases were not observed any specific microscopic lesions, but in some cases the symptoms such as being Melanized, being pale and appearance of Necrotic tumors in muscular tissues were observed in the muscle tissues. No tissues' damage was observed in 60% of the cases, but in the remaining the following signs were observed, 8% Hyperemia, 22% inflammatory cells and in 10% Necrosis. According to the survey, it was found that histopathological lesions were created due to the unfavorable environmental conditions such as water reduction of the lake, loss of some aquatic of the lake and disrupting in its natural cycle and arrival of waste water and residual water of surrounding villages into the lake. Therefore it is recommended to do necessary proceedings to reduce the histopathological waste.

Key words: Histopathologic, Edible muscles, Carp fish, Parishan.

INTRODUCTION

Rapid population growth in the world and reduction in stocks of fish, for various reasons, including pollution of water, environmental destruction and etc, have caused a greater need to be felt for protecting the health of this animal species. On the other hand, for several different reasons, the use of fish meat has primacy over other livestock meat that is on food consumption, which includes:

1. Feed conversation ratio in fish is 1.5 times further than poultry and 2 times more than sheep and cattle, because fish requires less energy to warm the body and to overcome the force of gravity.
2. Fish can also be grown in high dense conditions.
3. Nutritional value of fish meat is very high.
4. Fish meats have the essential amino acids.
5. Fish meat has a specific fatty acid which causes reduction of cholesterol of blood.

Therefore given to the importance use of fish meat, its safety seems necessary for use in human society. Carp fish have elongated body, their heads are compressed and flattened from top to bottom, their bodies' colors are greenish white, they have not barbel and have a short dorsal fin. They feed from the tiny floating organisms, such as the other fish, before they reach to the size 2- 3 cm, but gradually tend toward herbivorous diet and in this case they feed from plants and algae. The meat of this kind of fish, among the farmed Carp, is considered as one of the most desirable^{1, 2}.

Many diseases can cause complications in the edible tissues of fish. In order to facilitate investigations of these diseases, we have been divided them in to several groups, including: viral, parasitic, bacterial and fungal diseases, diseases caused by natural factors and complications, nutritional damages, fish poisoning and neo-plastic diseases.

There are 7 important parasites in freshwater fish that directly or indirectly cause damage and illness in edible tissues that include: Piscinoodinum Parasite (this parasite is a component of parasitic protozoa family and is from the family of Dinoflagellata)³, Ichtyobodo Parasite (Costia) (is one of the dangerous external parasites of freshwater fish that commonly seen in the fry which have weak immune systems. This parasite named as Ichtyobodo Necatrix and is more famous by the name of Costia Necatrix. The disease that makes by this kind of parasite, is Ichtyobodosis or Costiosis disease)⁴, Chilodonella Parasite (is the skin and the gill parasite of freshwater and saltwater and the disease that is caused by it, is Chilodonellasis disease), Ichthyophthirius Parasite (or ichthyophthirius multifiliis is one of the most dangerous ecto- parasites of freshwater fish which is cause the disease Ichthyophthiriasis)⁵, Microspora Parasite (the disease cause by this parasite is called Microsporidiosis disease)⁶,

Fig. 1: Granulation and necrotic muscle in the muscular tissues of theCarp of the Lake Parishan

Fig. 2: Necrosis in the muscular tissues of the Carp of the Lake Parishan

Fig. 3: The signs of necrosis and presence of inflammatory cells in the Carp of the Lake Parishan

Fig. 4: The signs of bloodshed in the muscular tissues of the Carp of the Lake Parishan

Lernaea Parasite (is a crustacean parasite which can cause sever cutaneous lesions in the freshwater fish and sometimes in the marine fish; it is also called hookworm, due to its specific form)^{7, 8} and Argulus Foliaceus Parasite or the FishLice (is one of the parasitic crustacean in every fish)^{7, 9}. Given the above, the edible tissues of fish as the main source of food are used in human society. So in the case of lack of health, their use can also create complications that are caused by disease in the edible tissues of fish and the disease of infected tissues may be transmitted to human. So the main purpose of this study is histopathological studies of edible muscular tissues of Parishan Lake Carp, in order to confirm its health for human society.

RESULTS

In this study 100 pieces of the yellow Carp fish were caught from Parishan Lake. After that, the samples in the containers containing of ice powder, were transferred to the laboratory of the Faculty of Veterinary Medicine. Then the fragments of fish tissues were separated by the sizes of 1×1 and were put in the fixative solution. Then for preparing of the microscopic sections, other steps were performed on it. From each samples, two tissue slides were prepared that each slide contains two tissue sections. After doing these processes, the tissue sections were studied in the terms of hyperemia, the amount of inflammatory cells and muscle necrosis, by optical microscope. Then the results were analyzed by using the SPSS statistical software, and were reported in the form of a table and with microscopic images.

In this study by sampling from 100 pieces of Parishan Lake's Carp, preparation of tissue sections from their muscles and microscopic examination of the slides, some results were observed such as hyperemia, the presence of inflammatory cells and necrosis in muscle cells.

According to the table (1), 8% hyperemia, 22% presence of inflammatory cells and 10% necrosis were observed in the muscle cells. And also in 60% of the cases, no lesion was found in the muscles of the Carp of Parishan Lake.

DISCUSSION AND CONCLUSION

The damages of the Carp fish edible tissues are caused by the bacterial, fungal, viral and parasitic agents, and natural factors and effects, toxicity and nutritional damages and neo- plastic disease. In this current research 100 pieces of the yellow Carp fish of the Lake Parishan were examined in the term of the damages of edible tissues. It is found that in addition of the presence of necrosis, the presence of inflammatory cells and hyperemia in the studied tissues, most of the investigated cases were completely healthy, histopathologically. Sadeghi Limanjub in 1386, was reported the presence of Cestode *Ligula* parasite in the fish of the Parishan Lake. Vicusova in a study in Japan was found that a disease with a hydrophilic *Aeromonas* infection has been observed in the colorful Carp. It seems that it is highly contagious disease. It is actually known that fish successfully replicate a combination of crown shape virus and A type hydrophilic infection that is associated with necrosis and hemorrhage of tissues¹⁰.

In India, nearly 500 species of fungi were separated from aquatic environments in which aquatics live. Very few of these fungi have been caused damages in the edible tissues of the Carp [10]. In a research, it was reported an epidemic in America Pennsylvania that resulted in 90% of mortality of Carp in that area^{10, 11}. Also it is mentioned in the past that the main reason of death of the Carp in Ireland was the Spring Virus Carp (SVC)^{11, 12}.

Table 1: Qualitative assessment of histopathological lesions in Carp of the Parishan Lake

Title	Hyperemia	The presence of inflammatory cells	Necrosis in the muscle cells	Healthy
Percentage	8%	22%	10%	60%

A research was performed in Great Britain on the Carpath that shows the presence of parasitic cyst in the edible tissues of fish [10, 11, 12]. In studies have been shown that the environment and environmental factors can have a significant effect on the health of the Carp and their growth and reproduction. Also changes in environmental parameters can impact on the other variables [10, 11, 12].

According to the mentioned research, can be argued that the presence of comparative health in the edible tissues of the Carp of Parishan Lake, may be due to the arrivals and departures of carrier of disease wild fish in to the Lake. However, the observed cases of histopathological lesions also was created due to unfavorable environmental conditions such as loss of the level of water of the Lake, loss of some aquatics of the Lake and disassembling of its natural cycle, the entrance of waste water and residual water of the surrounding villages into the lake.

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