

Effect of dietary medicinal plants on some biochemical hematological parameters of sterlet (*Acipenser ruthenus*)

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Abstract

In this study sterlet fish weighing $250\pm 10\text{g}$ & 4 groups of 3 replicates of healthy fish were divided into 10 segments. Medicinal plants essence *Satureja hortensis*, *Mentha longifolia*, *Zataria multiflora* More than one percent was added to the daily ration for a month. at the end of testing during a month one month, the amount of blood from the tail fin of each fish took 2ml. According to fish fed *Zataria multiflora*, increased HDL and cholesterol levels were observed compared to other groups. The highest TG was also obtained in fish fed *Mentha longifolia*. The lowest amount of total protein belongs to the control group and in other groups receiving the of medicinal plants essence, this factor has improved and the increase of this factor in the group receiving the of *Satureja hortensis* and *Mentha longifolia* with the control group is significant ($p<0.05$). Most of the Alb changes were from the *Mentha longifolia* essence group. The results of other blood parameters showed that Alb, cholesterol, HDL and TG levels in experimental groups did not significantly differ between the control and other groups ($p>0.05$). This study showed that up to 1% medicinal plants in the diet of sterlet had no negative impact on the blood factors of fish.

Keywords: Albumin, Blood factors, Medicinal plants, Sterlet (*Acipenser ruthenus*).

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Introduction

In recent years, as a species of freshwater fish sterlet sturgeons are more compatible with Iranians internal waters is of great concern. Sturgeon breeding of domestic water has been on the agenda of the Iranian Fisheries Organization (Lukin *et al.*, 1981).

Sterlet a small variety of semi-migratory sturgeons which live in fresh water in the Volga river basin is the most ubiquitous seen in most internal waters of Russia is also the native (Bronzi *et al.*, 1999). Aquaculture industry in rapid development of new outbreaks of unknown faces that economic development is strongly influenced.

Because the fish farming industry, is young and new and especially if it is not done properly in the underlying action many problems, including diseases, indiscriminate use of antibiotics and other problems that are found in salmon farming, will result. In recent years the use of immune-stimulants in fish farming in order to increase safety and non-specific immune response and protect the body against disease, are generalized so it seems the use of materials stimulating the immune system is the perfect solution for the control of aquatic animal diseases (Harikrishnan *et al.*, 2011).

In addition to immune stimulants increased resistance against diseases, in different ways, are stimulating growth also causes the growth in aquaculture is the most important objectives, trends in the use of immune stimulants and

growth is an increasing trend (Guojun *et al.*, 2006).

The types of immune stimuli and growth, immune stimulating bene fits of plant origin, including lack of resistance factors pathogenic, availability, less risk to the environment and animals and has a lower price (Raissy and Moumeni, 2016). In this study, the effects of three groups of essential oils of *Mentha longifolia*, *Satureja hortensis* and *Zataria multiflora* on some biochemical parameters were investigated.

Materials and methods

The research field of reproduction and aquaculture research center in Isfahan Zob-Ahan Highway 12km, in this study laboratory hematology and laboratory procedures Veterinary Poly Clinic Branch University located in Qian done.

Preparing herbal essence

Essence of Essence Pharmaceutical Company, Kashan, Isfahan Province were Baryj.

Experimental treatments

Fish into four groups, three replicates were divided into 10 pieces of fish entering the hall to avoid direct sunlight and artificial lighting was used to evenly. Capacity of 1200 liters of water per tub and water inlet and Drych Separate outputs, respectively. Mean fish weight was 250 ± 10 g and all the fish were healthy and had no history of disease water properties including temperature $=21 \pm 0.5^\circ\text{C}$, EC=1694, pH=8.2, and ponds once per day Siphon off

the floor was clean. Essential purchase 1% was added to the daily feed. The food is instrumental 2 Calculate the percentage of fish biomass and certain promises were given daily for a month to fish. At the end of a month of blood from the caudal vein of fish hematology and serology was performed and factors associated with non-specific immunity of fish, were measured. At each sampling time by sterile syringes 2 ml of blood from each fish as heparinized with a 1 ml and 1 ml anticoagulant to separate order to evaluate hematology and serum factors immediately transferred to the laboratory were. Serum factors include total protein (Tp) by colorimetric method by Pars Azmun kit and Albumin was measured with Pars Azmun serum detection kit and cholesterol, HDL and TG parameters were measured with Pars Azmun kit.

Statistical analysis

The data of this study in a completely randomized design with three replications way ANOVA using statistical software SPSS ver18 were analyzed. For comparison Duncan test at 5% probability level was used.

Results and Discussion

According to Figure1, the lowest amount of total protein is related to the control group and in other groups receiving essential oils of medicinal plants, this factor has improved and the increase of this factor is in the group receiving *Satureja hortensis* essential oil and *Mentha longifolia* essential oil

was significant with the control group ($p < 0.05$).

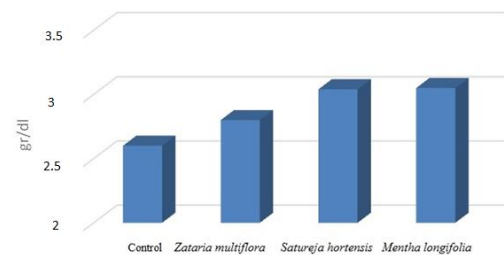


Figure 1: The amount of changes in total protein (g/dl) in different treatments.

According to the Figure 2, it can be seen that the lowest amount of albumin belongs to the control group and the highest value belongs to *Mentha longifolia*, although there was no statistically significant difference between the groups.

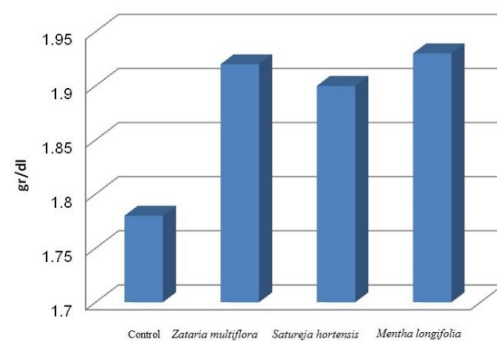


Figure 2: The rate of albumin (g/dl) changes in different treatments.

According to the results (Figs. 3 and 4), fish fed with *Zataria multiflora* showed an increase in HDL and cholesterol compared to other groups.

Also, the highest blood triglyceride was obtained in fish fed with *Mentha longifolia* (Fig. 5).

Due to the multiplicity of immune stimulants in the field of probiotics, enzymes and essential oils of medicinal plants, etc., the variety and history of medicinal plants in Iran and the proven effects of these plants on human safety and various animal species that also affect safety and Co-growth is predicted in different species of fish.

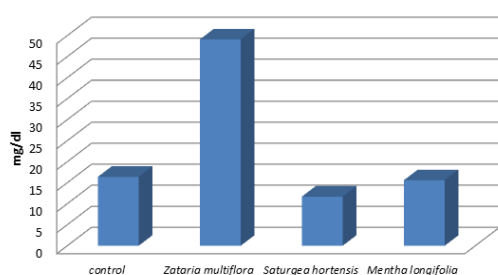


Figure 3: The rate of HDL(mg/dl) changes in different treatments.

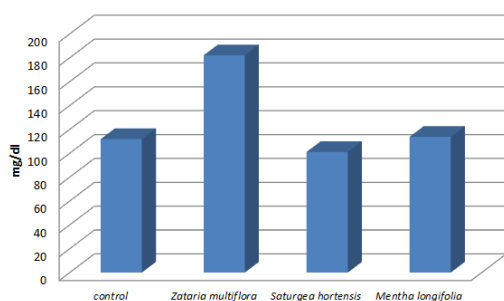


Figure 4: The rate of CHOL (mg/dl) changes in different treatments.

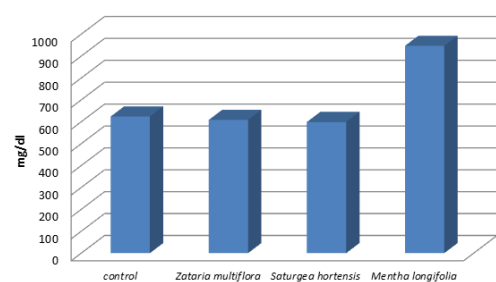


Figure 5: The rate of TG(mg/dl) changes in different treatments.

Also due to the potential of these stimulants to replace antibiotics that have many detrimental effects on the

body of fish, water and the environment.

Due to the diversity of medicinal plants throughout Iran, it is possible to produce and consume feed without consumption with drugs and antibiotics, as well as growth and safety stimulants for fish in fish farms and recommend that this requires a lot of money and research for many years. It needs this request from researchers and students active in the field of fisheries and the cooperation of relevant agencies.

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