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CHANGES,OCCURRED IN THE FISH BODY UNDER THE INFLUENCE OF THE PLEROCERCOIDS LIGULA INTESTINALIS(LITERATURE REVIEW)

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Abstract: *Thisarticleprovidesinformationaboutchanges occurring in the fish body infected withLigula Intestinalis helminths.*

Keywords:*ligula intestinalis,fish, helminthic infection, cestoid worms,worm-infested, parasite, plerocercoid,lympho-myeloid complex,epizooty.*

THE ACTUALITY OF THE TOPIC

Fish farmingisonethepromisingbranchesof agricultural industry, which is based on farming of various types of commercial fish either in natural reservoirs or artificial lakes. Modern, intensiveformsoffishfarmingmakeprovisionto increase thenormsoffishholdingdensity, which causes their close contact; hence it generates favourable conditions for spreading of various diseases.Measuresonincreasingthenatural forage base of water reservoirs take a certain role in spreading infestation, which provides an increased number of intermediate hosts of some parasites, in particular taenia.

The objectives of the development of fisheries and the definition ofspecific measures for the development of fish farming of the republic are specified in the decree of the President of the Republic of Uzbekistan, dated May 1, 2017 PP-2939 "On Measures to Improve the Fisheries Management System" in the Cabinet's Resolution of the Republic of UzbekistanOctober 25, 2016 No. 361 "On measures to further improvement of the system of state veterinary service" in the Decree of the President of the Republic of Uzbekistan UP-4947, dated February 7, 2017 "On the Strategy for Further Development of the Republic of Uzbekistan" and other regulatory documents relating to this area.

AIMS OFRESEARCH

In recent years, according to the literary data it was detected that there were analyzed the state of the effects of Ligula Intestinalis in the body of fishin water reservoirs and pond farms in Uzbekistan and in some other countries.

METHODS AND RESULTS.

Plerocercoids Ligula intestinalis, which live in the interior of the fish body - the dominant phase of its life cycle is worm'slifetime and depth of impact on the host.The authors summarized the negative effects of worms on fish as follows:

a) Mechanical pressureto the body; b) the direct in taking of some of the nutrients; b) a failureof metabolism; c) deep changes in blood composition; (d) hypogenitalism of the genital glands or castration.Because l.intestinalis causes epizoocy from time to time, and sometimes contaminated fish die due to a rupture of the body wall, the spread of the parasite is regularly monitored.[1] According to various authors, infection with plerocoids affects the size of the body and weight of some organs of their hosts - fish.The effect of liglesis on the growth of the bream between the ages of 1+ and 7+ has been established.[20]

Based on the calculation of the standard length of edges of fish scales, the fish's scalethere were made conclusion that the breams, worm-infested with L.intestinalis, their growth is delayed compared to healthy fish and during the first five years. There are significant differences in the length and mass of contaminated and uninfected roaches from the lakes.Campotosto, indicating the strong effect of the parasite on the development of fish. [17]At the same time, there is an evidence of increase in the growth of contaminated fish compared to uninfected fish.Thus, the length and weight of the fish body in different age groups of grass carps, not infected and infected with a ligaly, had very close values or were slightly higher in infected fish [4]. In conditions of artificial breeding of white cupids in the summer-autumn period, fish receivefeed in sufficient quantities, and the presence of plerocedis, according to some authors [5], contributes toincreased nutrition of fish and leads to an increase in growth, although the fatness of such individuals is very low.In natural water reservoirs, there has been establisheddifferent effects of infection with plerocoids on the growth rate of three roach populations.

Onlyonepopulationhastheparasite-inducedgigantisminthefirsttwoyearsoffishlife.Increased growth depends on the rate of parasitic infection.The authors [16] associate the gigantism of fish with the parasite-induced mortality in this population a year earlier.Many researchers found a decrease in body weight, heart, liver, spleen and kidneys [5, 9, 19, 21] in fish contaminated with plerocoids.At the same time, there is also an evidence of no change or even an increase in the mass of internal organs of infected and uninfected fish.Thus, the mass of the liver and hepatosomatic index of infested and not infested breams at the age of 3+/ 5+, did not significantly differ [4], there was noted an increase in the mass of the kidneys in white cupid [5], and the catostomus– gallbladder [19].Infection

with plerocoids is accompanied by changes in muscle tissue. Analyses showed a decrease in the number of fibrillation in the musculature, apparently associated with an increase in the level of corticosteroid hormones [18].It has been established that the water content in the muscles of infected bream increases, the number of common lipidsis steadily reduced, proteins - practically does not change, but and the level of concentration of glycogen is significantly reduced [3, 4].It has also been found that at the end of winter period, the amino acid index of the muscle protein of the infected roach is much lower than in the summer time [11]. It was found a reliable decrease (by 88.1%) of alkaline phosphate in the liver of the white Amur [5].Similar but deeper changes in the host's body is caused by infection with liguscatostomus and, in particular, degradation and even necrosis of the liver along with an increase in the gallbladder and signs of anorexia [18].Changes in the genital glandsof infected fish.Much attention is paid to the study of the effect of infection with plerocoids on the development of genital gland of fish.The negative effects of infection on the development of the reproductive system and the state of genital gland in most males and some female bream have been detected [4].It shows the slowdown in the growth of genital gland, reducing their absolute and relative mass in the absence of destructive changes at the cellular level.The genital glands of infected roaches do not undergo seasonal cycles of development and regression and resembleirrespective of their age. At the same time, ligula liguladoesn't cause asexualization of fishbut inhibits the development of the genital glands. At the same time, the genital glands ofinfected pescar more developed than those ones, i.e. dace [11].It is also assumed that the parasite canexert a stressful effect on fish by altering the content of corticosteroids in the blood plasm, which leads to delay the release of pituitary hormones or serotoninyielding, which interacts with fish pituitary hormones,may inhibittheir reproduction [7]. Blood indicators and immune response to L.intestinalis contamination will cause chronic infection by remaining in the fish body cavity, despite often being caused by severe pathology.Inmostfishspecies,
theparasiticinflammatoryprocesswillcausecontaminationwithpartialencapsidationofconnec tivetissues [21] butneverthelessingudgeon ligulait is missing [15].However, despite the existence of a cellular response to the presence of pleroccoid in fish and, in particular, in roaches, it is weak enough and not destructive to the worm, allowing them to survive while the host is alive [14, 22].A noticeable reaction of tissues to invasionwith plerocoids in roaches less than three months has been established; with the growth of fish cell response [10]. It has been shown that L.intestinalis infection causescell-mediated response of the host with products of 3 types of white blood cells, the most numerous resemblesmacrophagocyte. However, the presence of a large amount of plerocyde in the body cavity of body gudgeon does not causea notable cell-mediated response [15].It was

noted that there were significant changes in blood composition of different species of fish when they were infected with L.Intestinalis. There was observed a decrease in the content of total protein and albumins in the serum, which indicates serious changes and disordersin the infected bream [13].It has been established that the infection withL.intestinalis has a negative effect on the morphological parameters of the blood of the Siberian roach: the number of red blood cells and white blood cells is reduced; the number of foam cells increases, the content of the total protein, albuminand and globulin fractions is reduced [6].It was noted that hemoglobin levels and red blood cellsare reducedat the pescar, red-peppers, bream, minnow and spruce when they are infected with L.Intestinalis [9].It has been established that the level of free amino acids are lower in the blood plasm of infected roaches [20].It was established that it has great effect on the enzyme systems of adult fish than on hydrolase young fish.The kinesis of widely studied enzymes are decreasing with age more strongly than in healthy ones. Moreover, the potencyof carbohydrasis decreases more thanprotein-degrading enzyme.When the bream is infected with plerocoids, the effectiveness of nutrition is significantly reduced, which is worsened with the age of the fish [2].According to the analysis invasion of Ligula intestinalis plerocoid causes the depletion of lymphomyeloid tissue,which is responsible for forming an immune response, suppressing leukoposesis and changing the ratio between lymphocytes and granulocytes [7].

CONCLUSION

All analyzed data on the impact of infection with plerocoids on the intermediate host, confirm, supplement, expandand deepen the indicated directions of the parasite's influence to the host's body. Our task for further research is to figure out the mechanisms of underlying the changes in the host's body, caused by the parasite.

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