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Bioecological Features Of The Molody Parasitic Fauna Rutilus Aralensis Of The Amu Dalta

[1]Allamuratova Z.B., [2]Allamuratov B.
[1]Karakalpak Institute of Agriculture and Agrotechnologies
[2]Nukus State Pedagogical Institute

Abstract. The article examines the results of research on the ecological characteristics of fish parasites of the Turtkul pond farm in the conditions of the Southern Aral Sea region. It has been established that over 40 years, the parasitofauna of individual fish has significantly depleted in the lower reaches of the Amu Darya, particularly in the Turtkul pond farm system.
Keywords: Karakalpakstan, ecological factors, pond farms, parasitofauna, ecological analysis, water quality.

Currently, aquaculture is the most developing industry in the world due to its high efficiency and the ability to supply high-quality products to markets throughout the year. Recently, the effectiveness of aquaculture has increased significantly in many countries. Southern Aral Sea region, ecological transformations, system dynamics, population size, coherence, synergetics introduction a distinctive feature of modern systems ecology is the use of systems analysis and synergetics in the study of non-equilibrium natural complexes [6].
The functioning of fish farms in the current complex ecological situation leads to changes in the entire pond ecosystem and the emergence of diseases of various nature - infectious, parasitic, etc. Their study, generalization of ichthyopathological studies conducted in pond farms of Karakalpakstan, systematization of hydrochemical, toxicological, and other data is of undoubted theoretical and practical interest, allows assessing the situation created in fish farms of the region [Vasilkov, 1990; Golovin, 2000].
Fish, like other animals, are susceptible to various diseases. Fish diseases can occur both in natural water bodies and in various fish farms. In natural water bodies, diseases are more often caused by the intensive impact of anthropogenic factors on natural ecosystems. In artificial cultivation, diseases are more often manifested in those cases when unfavorable conditions are created for fish farming facilities [Grigorev et al., 2007]. Fish are susceptible to invasive diseases, some of which are dangerous for the health of the fish themselves and often cause their mass death, others are dangerous for humans and animals that feed on such fish. In addition, invasive diseases sharply reduce the quality of fish products [Strelkov, 2010]. Various factors contribute to the spread of parasitic fish diseases, including the use of low-quality feed, violation of fish farming technology, etc. [Grigoriev et al., 2017].
To date, there is no information about the infection of fish fry with the pathogen Dactylogyrus nanus, one of the representatives of the class of monogenetic suckers, depending on morphoanatomical features, their behavior depending on the water temperature. Therefore, this article presents the results of a study of the dynamics of infection by the pathogenic monogenetic sucker Dactylogyrus nanus rib Rutilus Aralensis in the first year of life, which are found in the reservoirs of the "Antika" water and fish farm of the Turtkul district, located in the south of the Republic of Karakalpakstan.
The negative results of human economic activity often disrupt the equilibrium state formed in nature over many centuries in the parasite-host system, which leads to the emergence of many diseases. In addition, at present, when cultivating fish in farms, diseases complicated by toxicosis, as well as those caused by several pathogens, are often noted.
Dactylogyrus - acute invasive diseases of fish caused by monogenetic suckers of the genus Dactylogyrus, affecting the gill filaments of fish. More than 150 species of monogenous fish in freshwater bodies of our republic have been described. The most pathogenic of these are *Dactylogyrus vastator*, *D. extensus*, and *D. anchoratus*. Representatives of these species more often infect fish bred in pond farms, often causing mass outbreaks of diseases and death of carp and herbivorous fish, especially young ones. Monogenea of other species mainly parasitize fish inhabiting natural bodies of water, and there are no mass outbreaks of dactylogyrosis among them.

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Information is presented on the norms of infection by pathogenic representatives of Dactylogyrus nanus of the class of monogenetic suckers, and their number dynamics depending on the morphoanatomical and ecological characteristics of one-year-old fry of Rutilus Aralensis, representatives of fish of the Carpovich family. In the "Antika" water fish farm of the Turtkul district, the laying of Rutilus Aralensis eggs actively continues from March 28-30 to the end of May at a temperature of 16.30C to 17.40C. According to our observations, from April 1 to 5, small and larger fry of Rutilus Aralensis, developing in one stage, were encountered in the coastal zone of the reservoir, therefore we took as a basis the morphoanatomical features of the pre-small and young period of this fish.

Let us consider the phased development of young animals in the pond farm of the Turtkul district. In the pre-mallow period of Rutilus Aralensis at 1-5 days of age, from April 1 to 5, when the body length reaches 5.8-6.8 mm, the pre-mallow period of mallets begin to move, gills and mouthparts are formed. At this stage of development, the yolk sac is medium or large, pear-shaped, fins are underdeveloped, and there is no air in the air sacs. The mouth below is not closed. Star-shaped pigment cells are located on the side of the abdomen and at the back along the length. For the pre-mallow period of Rutilus Aralensis, a sedentary lifestyle is characteristic, rarely rises from the depths to the surface, nutrition when attached to the plant occurs at the expense of yolk sacs. When examining 50 specimens of only fledglings for the first time in 1-5 days, the pathogen D. nanus was found not in the gills, but on the skin covering, the extensiveness of infection was 8%, the intensity was 1-1 specimens.

At the age of 45 days, the body length of the young of Rutilus Aralensis was 14.3-15.8 mm. The edges of the swimming fins for swimming are preserved on the ventral stripe, bone-bone stars are formed on the dorsal and anal fins, and ventral fins are formed. During this period, a cut is formed on the tail fin, the air sacs divide into two chambers and are fully formed. With the development of fins for swimming, the larval flock begins to move actively and floats to the coastal aquatic plants, feeding on zooplankton and other aquatic plants. At this stage of development of the young of Rutilus Aralensis at a water temperature of 20.4-23.50C, the mobility of the young intensifies and they switch to active feeding.

It seems to us that the increase in the infection of fry with the parasite D. Nanus according to our data is associated, firstly, with an increase in the temperature of water bodies and the greatest hatching of larvae from eggs of monogenous suckers. We also believe that the cause of infection and the basis of the invasion of young Rutilus Aralensis by the pathogen D. Nanus is the cohabitation of one-year-old young with the remains of 1-2-year-old fish. At this stage of development, the young *Rutilus Aralensis* quickly begin to move and reach the bottom, and begin to feed intensely on zoobenthos and zooplankton. The extensiveness of infection of the skin and gills of the young of Rutilus Aralensis D. Nanus at 60 days of age during the period of 28-30 May is 56%, the intensity is 1-19 pieces. It was also established that some fry, when accumulating in shallow waters, are more susceptible to Dactylogyrus nanus. At 90 days of age, the considered fry of the Aral pond reach a body length of 21.1-2.9 cm, all fins are formed, the body is completely covered with scales, the eyes are red, the air sacs of the two chambers are filled with air, externally already resembling an adult pond. According to our observations, when the reservoir temperature reaches 24.6-26.30C on July 28-30, the infection extensiveness of the young of Rutilus Aralensis D. Nanus reaches 68%, the intensity is 1-21 specimens, which is the highest degree of infection by the pathogen. In the Turtkul water-river farm during the summer period, a decrease in the infection of young *Rutilus Aralensis* D. nanus is observed due to a decrease in water temperature, so we assume this may be due to changes in biotic and abiotic factors. Indeed, in the Turtkul water basin of fish farming, during the ontogenetic development of young Rutilus Aralensis in the first year of life and due to changes in the bioecology of morphoanatomical development, the extensiveness and intensity of their infection with the pathogen D. nanus sharply increased by 30%.

Thus, in the ecological conditions of the Southern Aral Sea region in the Turtkul water basin of fish farming, the formation of the infection of young Rutilus Aralensis of the first year of life by the pathogenic representative of the class of monogenetic suckers Dactylogyrus nanus is subject to the law formulated by V.A. Dogel [Dogel, 1958]. Considering that fish of older age groups are carriers of the invasion, it is necessary to prevent their joint keeping with young fish.

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