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MEASURES TO PREVENT THE PROBLEMS OF COLD-WATER FISHERIES IN THE FOOTHILLS AND MOUNTAIN REGIONS OF THE REPUBLIC IN THE DEVELOPMENT OF HIGH-INCOME TYPES OF PRODUCTION

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ABSTRACT
Growth, rate of sexual maturity, fecundity, inter- and intra-population variability, natural conditions and aquaculture in many areas of the species range where they have been transplanted.
KEY WORDS: *Biological basis, Salmonella furunculosis, Vibriosis, Diagnostics, Epizootological data, Spread and economic damage.*

INTRODUCTION

In the conditions where fishing in Uzbekistan is completely at the disposal of the private sector, there is a shortage of fish in the population's diet, the creation of new jobs and the development of high-income types of production, the foothills and mountain areas of the republic have a significant reserve. Such conditions are characterized by the presence of a large number of water sources, which should be classified as cold water (that is, the water temperature in them does not exceed 18°C throughout the year). The conditions of our republic's mountainous and especially sub-mountainous regions are considered a new breeding ground for trout breeding for the republic. Therefore, most of the local fish farmers are not familiar with it. In the future, the emergence of new people in trout farming without basic knowledge of aquaculture will deepen the problem. There is no network of large fish nurseries in the republic, therefore, at the current stage, at the early stage of development of spawned caviar, it will be relatively convenient (including cheap) for farmers to bring in commercial flounder from them. Based on this, this work focuses on these very important aspects of the fishing cycle. A water source with a favorable gas exchange regime, temperature, and a number of other abiotic and biotic factors is necessary for the cultivation of rainbow trout. Rainbow flounder is a cold water fish. Spawning takes place when the water temperature is 4-10 °C (preferably 6-8 °C), and for embryonic development the water temperature is 6-13 °C, the optimal temperature for the development of larvae and fry is 10-14 °C need. As the fry develop, the water temperature can reach 18 °C. A comfortable temperature for one-year fry and commercial fish is 14-18°C. If the water temperature falls below 8 °C, young fish and commercial fish will not feed well and the efficiency of nutrient uptake will decrease. When the temperature drops below 7 °C and exceeds 18 °C, the flowerfish loses its appetite. If this situation continues for a long time, the flounder will stop feeding and the causative agents of fish diseases will become active. The lowest water temperature for this fish to develop is 0.1 °C, and it dies if the water temperature exceeds 25-26 °C. The optimal amount of dissolved oxygen in water is 9-11 mg/l, and the critical amount is 5 mg/l (measured from the water outlet of the fishing pond). For the embryonic development of flower fish, the amount of dissolved oxygen in water should not be less than 7.5 mg/l. The guaranteed rate of development of flowerfish is 10-11 mg/l of dissolved oxygen in water at the water inlet and 7 mg/l at the outlet. The rainbow flowerfish is an euryhaline species that adapts well from freshwater to brackish (marine) waters. However, hatching and the first stages of the life cycle take place in fresh water. Some rainbow trout, when their body length reaches 10-12 cm and total weight of 20-25 g, are transferred directly to seawater with a salinity of 28 o/o. can withstand, while other salmonids with a body length of 20 cm and a weight of up to 100 g need to adapt during the week. Such differences depend on the genetic characteristics of the fish. This indicator is not dangerous in the foothills of the republic, which are rich in fresh water sources. The water in the flower fish breeding farm is optimal when the amount of hydrogen potential is pN -7-8. It is also possible to use water with hydrogen potential - pH 6.5 - 9.A pH below 4.5 or above 9 is fatal for this fish. Baliqlarning o‘sish sur’ati kislotali muhitdagi suvlarda ishqoriy muhitdagi suvlarga nisbatan past bo‘ladi. Gulbaliq ikralari rN miqdori 4,5 dan past yoki 9 dan yuqori bo‘lganda yashamaydi.[1] Methods of bringing spawned trout roe at the "puppet" stage in the trout farms operating in the mountain and sub-mountain regions of Tashkent region, and from them embryo, larva, fry, fingerling (the size of a thumb) The number of objects cultivated in canoe fishing for the cultivation of crayfish in water bodies with natural water temperature has been increased, including the use of predatory fish belonging to different systematic groups. The main achievement of new biotechnologies is the study of the biological characteristics of cold-blooded fish living in water (universal solvent) environment in certain areas, where water quality indicators act as a limiting factor and can differ sharply from each other in different basins. Realizing that the life of fish

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is highly dependent on external environmental conditions makes it possible to choose objects and adapt new world technologies to a specific area. [3] Level of study of the problem. In world practice, the growth, rate of sexual maturation, fertility, inter-population and intra-population variability of rainbow trout (salmons) have been studied in natural conditions and in aquaculture in the range of the species and in many areas where they have been transplanted. Scientific researches are focused on breeding work and selection of rainbow flowerfish, as well as the passage of the process of sexual maturation and the formation of fertility. In Uzbekistan, the rainbow flowerfish was not studied because it did not live there before. In the conditions of our republic, researches on breeding rainbow flowerfish have been studied by D. Abdunazarov and co-authors, B. Kamilov and co-authors, M. Yuldashov and co-authors. Due to the recent introduction of the species to the conditions of aquaculture in the republic, the assessment of the processes of growth and reproductive biology is relevant for its future development.[2]

The purpose of the study is to evaluate the characteristics of sexual maturity and fertility indicators in the conditions of industrial fishing in the foothills of the Chirchik river basin in order to develop the technology of industrial breeding of rainbow trout in the Republic.

EXPERIMENTAL PART

The practical results of the research are as follows: The cage farm studied is in very cold water (water temperature 5-130 C throughout the year) to form its own school of parent fish, however, when using high-quality high-protein feed, the fish are good. it reaches its size (250 g) in the second year, and 1000 g in the third year. The processes of gonadogenesis and gametogenesis take place normally at the natural temperature of the water in the conditions of the studied basins, and the methods of analyzing the reproductive biology of the rainbow flowerfish can be applied to the conditions of our region. In the water basin, in different breed groups, both sexes reach sexual maturity for the first time at the age of 2-3 years. Seasonally, sexual maturity occurs in late November and early December. The indicators of fertility fully correspond to the indicators of countries with leading aquaculture. For the construction of fish nurseries, it is necessary to have at least 3 age groups of parents and a school of fish that fill the parent fish group, as well as grazing ponds (including cages, running water pools) for the reserve group.[4]

The practical importance of the research is based on the knowledge gained on intensive aquaculture in the republic, based on the information obtained, it is explained by the fact that it is possible to recommend the standards of formation of a stock of relatively dense parent fish for planning the development of rainbow flowerfish breeding in the republic.

Implementation of the research results based on the results of the research conducted on the formation and fertility of rainbow flowerfish (Oncorchynchus mykiss) reproductive characteristics in the conditions of Uzbekistan:
The researcher's recommendation to treat caviar with a weak solution of potassium permanganate during the incubation process was put into practice at the "Kandil Flight - Fayz" farm (No. 02/23-2205 of the State Veterinary and Animal Husbandry Development Committee of the Republic of Uzbekistan dated December 14, 2021 reference number) as a result, it was noted that the conversion of larvae to larvae increased from the usual rate of 50% to 72% by preventing saprolegnia disease. The researcher's proposal to use an aeration device and a degasser during the incubation process was put into practice by "Mr Fish Farona Companu" LLC ("Uzbekbaliqsanoat" association reference No. 08/991 dated December 16, 2021). the yield of free embryos increased from the usual 30-40% to 72.8%, and the larval yield increased from the usual (40%) to 24-28.6%. " Golden fish group" LLC implemented the researcher's recommendation to bring and incubate the fertilized triploid caviar of the rainbow flowerfish ("Uzbekbaliqsanoat" association No. 08/991 dated December 16, 2021) 18-30% increase compared to the productivity indicator of commercial fish from spawned normal caviar. The implementation of the researcher's recommendation in the private enterprise "Eto ya" (reference No. 02/23-2205 dated December 14, 2021 of the State Committee for Veterinary and Livestock Development of the Republic of Uzbekistan) resulted in a 25% increase in the productivity of commercial fish. [5]

The optimal temperature of water in pools is 14-18 ° C, the amount of dissolved oxygen in water should not be less than 7 mg/l.

Figure 1. Circular (left) and rectangular (right) swimming pools for chick care.

Spawns weighing up to 1 g are transferred to pools with a water level of 0.4 m at a breeding density of 25,000 pieces/m3, which corresponds to a density of 10,000 pieces/m2. It is necessary to increase the water consumption to 3-5 l / min / 1000 pieces and ensure a complete exchange of water in 10-15 minutes.

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After the fry weight exceeds 1 g, the breeding density should be reduced to 7,500 pieces/m3 (this corresponds to 3,000 pieces/m2 when the water level is 0.4 m). At such a density, chicks are grown until their weight is 5 g. At the beginning of this period (when chicks weigh 1 g), water consumption is at the level of 8-13 l/min/1000 pieces, and at the end (4-5 g), water consumption is 2.5-3.5 l/min/piece. level is maintained. The time of complete water exchange is 10-15 minutes.

For the rapid growth and normal development of the fish generation, it is necessary to organize proper feeding of the fish. Also, it is necessary to constantly monitor the cleanliness of the pool water, the cleanliness of the bottom, walls, and the hydrochemical quality of the water.

Rainbow flowerfish is a predatory, omnivorous fish. Therefore, it is necessary to divide them into groups according to their size, starting from their freshness. Sorting is done using sorting devices or manually (if small). A sorting table is used for this. Groups of chicks of different sizes are transplanted into different pools or cages. In this case, rectangular pools with a size of 6-30 m3 and larger (the ratio of width to length is 4-8 m per 1 meter) or circular pools with rounded corners are used. The water depth in the pools is 0.8 - 1 m (so it is better to have pools with a height of 1.2 m). In small farms, chickpeas are often grown in earthen ponds (up to 500 m2).

3 m deep and 15 m2 cage structures are attached. Cage size should be 3.5–5 mm for chickens weighing 1 g, 6 mm for 2 g, 8 mm for 4 g and 12 mm for 10 g. The demand for water quality parameters is the same as that of water. The density of the transfer to the pools is 2,000 pieces / m3. At the end of this stage, the water consumption in the pools is 35 - 50 l/min. / 1000 pieces or 2 - 2.5 l/min/kg of biomass. Complete water exchange should take place in 10-15 minutes. Fingerling chicks are grown until their weight is 20-25 g. In soil ponds (where it is very difficult to ensure such a rapid water exchange), relatively low cultivation densities are used or additional aeration devices are used (Figure 8). In ponds with a depth of 0.8 m and a complete water exchange of 2-3 hours, fry are transferred at a breeding density of 600 pieces / m3. When the water exchange in the pond (0.8 m deep) slows down, the density of cultivation is further reduced.[6] Caviar incubation should be done in the dark, for this the lights in the room should be turned off. When using a tarpaulin device, they are covered with an opaque material. The causative agents of infectious diseases of fish are viruses, bacteria and fungi. Researches of recent years show that many, severe diseases of fish, especially in artificially stocked ponds, are due to viral diseases. However, the participation of bacteria in the pathogenesis of some viral diseases has been identified and confirmed in research. Due to the participation of bacteria in viral diseases, it is the cause of complicated processes, and the secondary causative agents have been confirmed. Infectious diseases are widespread in almost all types of fisheries and cause great economic losses. Among them, the most common are bacterial diseases: aeromonosis (redfish) and pseudomonosis of carp fish, flirunculosis, vibriosis and myxobacteriosis of salmon, mycobacteriosis, aeromonosis and pseudomonosis of aquarium fish, etc. takes the main place. Viral diseases have become widespread in recent decades, including carp spring virus (SVVV) and salmon viral hemorrhagic septicemia (VGS). Among fungi, branchiomycosis, ichthyofonosis, dermatomycosis are epizootologically important. Salmonella furunculosis - Salmonella aeromonosis (furunculosis) - an infectious disease of salmonella, caused by bacteria belonging to the Aeromonas genus of the Vibrionaceae family. Spread and economic damage. Furunculosis is common in all salmon farming countries except Australia and Tasmania. A sharp epidemic of the disease has spread in trout breeding farms in Russia and Ukraine, aeromonas was not detected in salmon in the Sakhalin River. Trigger. The length of Aeromonas salmonicida bacterium is 1.7-2.7x1 μm. Favorable growth of this facultative aerobe is 18-25°C. Epizootological information. All species of salmonid fish are susceptible to furunculosis, but brook and rainbow trout, gorbusha, and catfish are not susceptible to the disease. Mostly two-year-old fish are infected during spawning. Young fish get sick. Epizootics or enzootics occur mainly in spring and summer. At a temperature below 7 °C, the disease is in a latent state. The source of infection is sick fish and fish susceptible to bacteria, the causative agent secretes secret products and excrement into the water. Invertebrates from disease-susceptible farms spread from animal feeds, caviar and during uncontrolled transport of infected fish. Contamination begins with water transportation, inventory, live fish containers, and contaminated soil.

Vibriosis is an infectious disease of salmon, eel and other fish caused by Vibrio bacteria belonging to the Vibrionaceae family. Spread and economic damage. Vibriosis is widespread in saltwater trout and trout farms. The disease has an enzootic origin, causes mass death of fish and requires huge costs for the recovery of diseased farms. Trigger. Vibrio anguillarum is a bacterium. They are gram-negative, oxidase-positive, flexible or linear with a straight rod; does not form spores or capsules; facultative aerobe. They grow at a temperature of 25-37°C when 1.5-3% sodium chloride is added to the normal nutrient medium, the optimal condition is 18-25°C. Vibrios are widespread in nature. Honey is called Vibrio parahaemoliticus strains, which are also pathogenic for humans. Vibriosis infects salmonids (flour fish), flounder, carp, red eye fish, and okun fish in brackish water basins. But for rainbow flowerfish, the disease is the most dangerous, and fish that are one year old and older are affected. Diseased fish, their secretions and dead fish are the source of infectious agents. The disease is transmitted by direct contact and through infected water. Damage to fish occurs through injuries, skin and alimentary tract. The appearance of vibriosis contributes to the pollution of water bodies with organic substances. Immunity decreases in sick fish. Pathogenesis and disease symptoms. Blood decreases, the causative agent spreads in all organs and tissues, toxemia, septicemia occurs, degenerative-necrobiotic changes occur in organs, serious-hemorrhagic inflammations occur. The incubation period is 6-14 days. The disease is observed acutely and chronically. In an acute course, the first symptoms of the disease are refusal of food, decreased active activity. In sick fish, reddening of the skin, foci of destruction of the gills, skin ulcers, and in some, swelling in the muscles, accumulation of pus, and

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anemia of injuries are observed. The disease often ends with the death of fish. In its chronic course, it differs in the formation of various wounds on the skin, and it can gradually heal over 3-4 months. Fish begin to feed, but up to 50% of fish may die in the fall. The acute course is characterized by hyperemia, enlargement of the spleen and kidneys, punctate blood inclusions in the liver parenchyma, swelling of the serous membrane, fluid accumulation in the abdominal cavity, and hydration and softening of skeletal muscles. In its chronic course, it is limited to small changes in the skin and internal organs. [5]

Diagnostics. Diagnosis epizootological data, clinical signs and is carried out on the basis of bacteriological studies, taking into account pathologoanatomical changes. In the acute course of the disease, pathogens are released in large quantities from the blood, spleen, kidney, liver, as well as from abscesses and wounds. Healthy fish susceptible to disease are affected by pathogenic bacteria. Serological methods of treatment have been developed. Prevention and countermeasures. Access to unsanitary farms infected with vibriosis will be restricted, the transportation of fish for breeding there, and their transportation in domestic farms will be prohibited. Medicines such as furazolidone, oxytetracycline, and levomycetin are added to the fish feed for treatment. Furazolidone is used in the amount of 8-9 g per 100 kg of fish weight for 5-10 days at intervals of 1-2 days. Oxytetracycline is added to the feed in the amount of 7 g per 100 kg of fish weight, Levomycetin in the amount of 5 g per 100 kg fish weight on the first day and 3 g in the next 2-6 days. Courses are repeated several times in the summer. Fishes are done 21 days after treatment.

In order to prevent vibriosis, it is necessary to follow veterinary and sanitary rules when transporting fish, to prevent their injury, to limit exposure to stress of fish, to improve environmental conditions in water bodies, and to provide fish with nutritious food. Vaccines against the disease should be developed. [3]

Sanitary assessment of fish. It is allowed to eat commercial fish without any restrictions without external signs of disease. Sick fish that have lost their appearance are not allowed to be eaten and are boiled and used as animal feed or disposed of. Myxobacteriosis (pillar disease) is an infectious disease of salmonids caused by myxobacteria belonging to the genus Flexibacter.

Spread and economic damage. The enzootic course of the disease is widespread in trout-breeding farms, ponds and ponds, and salmon-breeding farms in brackish and warm waters. Sometimes the economic damage of myxobacteriosis in carp fish in warm water farms consists of losses related to the death of fish and costs for the health of fisheries.

Trigger. Chondrococcus columnaris (Flexibacter columnaris) mucus bacterium is gram-negative, rod-less rod size 4-8x0.5 mm, filamentous and ring-shaped. In solid media, bacteria form colonies of grayish-fluid slime, and some bacteria exhibit gliding or tortuous movements. does. Pathogens develop at a temperature of 4-30° C.

Epizootological information. Mainly, young salmonids are infected from larvae to one-year-olds, in which mortality can reach 30-90%. The disease also occurs in carp, white carp, channel flounder, aquarium and some other fish species. Adults are not sick, but they are bacteria are carriers. Sources of infectious agents sick and dead fish, as well as polluted water and fish farming equipment. The disease occurs in hot seasons, sometimes at low temperatures. The disease usually occurs in farms with high-quality water, in ponds with a large amount of organic matter, artificial ponds. Injuries in fish as a result of various fishing manipulations contribute to damage. Pathogenesis and disease symptoms. Pathogens live and reproduce mainly in wounds, skin coverings and musculature, sometimes they form hematogenous and degenerative lesions in internal organs. causes changes and inflammations. The incubation period has not been studied. Sick fish lie upwards and do not receive food. Jabra myxobacteriosis is characterized by the destruction of Jabra leaves as a result of increased swelling and mucilage. The flap of the wound is raised due to the swelling of the wound. Cutaneous myxobacteriosis begins with blanching of the skin around the dorsal fins (gray saddle), followed by skin lesions in the form of a line on the sidewall and ventral margin (gray belt). Patchy lesions of the skin appear again on the head, fins, around the mouth and other places. Entering the subcutaneous tissue and muscles, the bacteria causes dermatitis. Pathologoanatomical changes. Swelling, necrotic foci are noted in the wound, spreading from the upper lobes to the arch of the wound, and the joining (adhesion) of the respiratory layers and the writing of the shape of the wound are observed. There are no serious changes in internal organs, liver with the exception of mild hyperemia, and sometimes fluid accumulates in the abdominal cavity. [3]

Diagnosis. The diagnosis is made mainly on the basis of characteristic clinical signs, epizootological data and pathologoanatomical changes. For the latter diagnosis, long curved gram-negative bacilli can be seen in natural and stained color microscopic examinations of the skin and mucous membranes of the affected area, which in most cases are located in the form of a column. If necessary, a pure bacterial culture is isolated.

Prevention and control. First, changing the hydrochemical regime of water bodies, cleaning water bodies from pollution, increasing flows, etc. For the treatment of sick fish, trypaflavin with a concentration of 3-6 g/m3 for 12 hours for 2-3 consecutive days and 1.5 g/m3 of copper sulfate for 1-2 hours are taken in long baths. For gross infection, oxytetracycline at a dose of 50-100 mg/kg for 10 days with feed or oral sulfonamides at 200-240 mg/kg of fish weight is recommended. Disease prevention is important to help improve pond sanitation and prevent injury to fish.

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Figure 2. White (dead) caviar to be removed.

During incubation, it is necessary to prevent the development of fungal disease - saprolegnia. For this, a number of preventive measures are taken: when the caviar is placed in the incubator, after two days, and then 1-2 times a week until the appearance of free embryos in a solution; It is processed for 10 minutes in a solution of malachite green in a ratio of 1:50000, a solution of chloramine in a ratio of 1:30000 or a solution of formalin in a ratio of 1:2000.

SUMMARY PART

In conclusion, taking into account that fish diseases cause serious problems in the development of the fishing industry, infectious and non-infectious diseases of fish, description of the disease, morpho-biological characteristics of the causative agent, clinical signs of the disease, scientifically based information on epizootology and its prevention is provided. This will preserve the number of fish, increase their productivity, and also ensure the population's need for quality fish products. will come.

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