

Table 3.

Medial plastic indices of morphological characteristics of largemouth basses (*Micropterus salmoides*), that were caught in a Luka bay of the Svitiaz' lake in August 2018

The name of the morphological characteristic	Luka bay, Svitiaz' lake
	<i>M</i>
<i>Plastic features: % of length of a head</i>	
Length of a snout (<i>lr</i>)	32,7
Eye diameter (<i>do</i>)	16,4
Length of a middle part of the head (<i>lCm</i>)	73,8
Cheek depth (<i>po</i>)	50,9
Length of an upper jaw (<i>mx</i>)	50,2
Height of an upper jaw (<i>hmx</i>)	8,4
Length of a lower jaw (<i>mn</i>)	54,9
Height of a head near the nape (<i>hc</i>)	82,5
Width of a head (<i>io</i>)	36,7

So, as a result of existing research, morphometric analysis of the largemouth bass (*Micropterus salmoides*) from the Svitiaz' lake of Shatsky National Natural Park was made.

References

1. Methods of hydrogeological research of surface water / edited by Romanenko V.D. Kyiv: Logos, 2006. 408. p.
2. Mitrofanov V. P. Ecological basics of a morphometric analysis of the fish. Alma-Ata: KazSU, 1977. 35. p.
3. Pravdin I. F. Fishes study guide. Leningrad, 1939. 246. p.
4. Makarenko A.A., Shevchenko P.G., Sytnik Yu.M. The morphometric performance of one year old hybrids of silver carp and bighead carp // Scientific bulletin of National University of Life and Environmental Sciences of Ukraine «Production and reprocessing technology of livestock products» Series. Kyiv, 2018. Vol. 289. P. 110 – 119.
5. Nosal' A.D., Simonova L.G. Fish population of Volin and Rovno region lakes and fishing activities // Works of SRIFF UAACS. Kyiv: State publishing house of agricultural literature Ukr. SSR, 1958. № 11. P. 111–131.

Karlova L.V., Lesnovska O.V, Mamrak V.D.

FEATURES OF SELECTION AND BREEDING WORK IN CARP GROWING

Dnipro State Agrarian and Economic University

49600, Dnipro, Serhii Efremov Str., 25, Ukraine, lesnovskay_elena@ukr.net

The fish industry of Ukraine occupies a significant place in provision the population with food products, and branches of the national economy - raw materials. The significance of the industry is important for the reproduction of natural resources and the increase of employment of the population.

After 2015 year, in accordance with the economic crisis and the instability of the political situation in the country, the production volumes of the main types of fish products and other watery living resources has declined significantly. This led to a decrease in the share of the fish industry in the food supply of Ukraine. The physiologically substantiated

annual requirement for fish and fish products is about 1 million tons. It is about 20 kilograms per capita. Today, the average level of consumption reaches just over 8 kilograms a year. As the reason is a sharp decline of amount of finance in the fish industry. First of all, this is connected with the deterioration of the technical state of equipment, the rapid tempo of its moral and physical ageing, and the failure of capital assets of enterprises (*Serpunin, 2003*).

In addition, in recent decades there were significant difficulties in organization of selection and breeding work in the fish farming. Breeding herds of carp and other fish do not reach breeding conditions, often staying in the state of inbred depression. In the vast majority of subjects of the tribal affairs in the fish culture there are no programs for the development and expansion of selection and breeding work, there is an urgent lack of specialists-breeders, the importation of breeding material from abroad is chaotic, uncontrolled hybridization occurs, which leads to indigestion the genetic base of domestic fish farming (*Bekh, 2008*).

Modern breeding work in fish farming provides a complex of organizational and fish farming measures directed on the improving of hereditary qualities and increase of the productivity of pond fish. These measures include technically correct growing and perfect keeping of fish, observance of the right methods of assortment and selection, provision its full value nutrition at all stages of development.

Before the beginning of breeding work, it is important to determine what new or improved old race and with what exactly it is economically valuable qualities to get, for which geographic conditions the selected race is intended, that it should differ from the races available at the farms of the given zone.

The main object of warm-water stable fish farming for today is carp. Carp - comes from its wild form – wild carp (sazan). In Ukraine, 2 races were created: Ukrainian scaled and Ukrainian framed carps and 3 intrapedigree species: Ukrainian scaled nyvkivskyi, Ukrainian scaly lyubinskyi and Ukrainian framed lyubinskyi. In the scaled carp, the whole body from the head to the tail fin is covered with a homogeneous scales, located in rows. The mirror or low-scaled carps, in which the scales are larger, shiny, resembles a mirror; bare - in which a few scales are under the spinal fin, near the tail, anal or on the body.

In the breeding work with the carp, two problems are solved:

1. Improvement of productive qualities at the expense of application of the nesting breeding method, which is based on the selection of the best combinations of genotypes. To do this, it is necessary to achieve simultaneous landing for spawning a series of selected nests (1: 1) in a period favorable for spawning; carrying out of the frontal spawning of all nesting nurseries (growing of all offspring under equal conditions with two-three-fold replication of test); studying the quality of caviar, the percentage of impregnation, the survival of baby fish in the early stages of development, as well as the mass and exterior at the end of the growing season.

2. Creation of breeds adapted to specific cultivation conditions. The distribution of these tasks is conditional, because in any case it is a question of improving productivity against the background of specific conditions of cultivation (*Sherman, Grinzhevsky, Gritsyak, 1999*).

The solution of the set tasks is possible only at the expense of application of such basic directions of selection of carp:

1. Selection of races, more fully absorb food in the process of growth.
2. Creation of races, suitable for maximum use (eating) of feed organisms available in the pond.

3. Improvement of taste qualities, increase of food value and decrease of the proportion of inedible parts of the body (improvement of the merchandise qualities of carp).

4. The selection of races, resistant to the adverse effects of the number factors of environment, first of all to the lack of oxygen, extreme temperatures.

5. The selection of races resistant to parasitic and infectious diseases, especially against the rubella of carp.

6. Increase the genetic potential of carp productivity by effectively using the gene pool from selective races of domestic and foreign breeding, on the one hand, and conservation and rational use in the breeding process of the gene pool of local races - on the other.

7. Paying due attention to the creation of races of the combined direction of productivity.

8. Creation of synthetic populations by means of combining the best qualities of specialized and combined races of foreign and local selection.

9. In order to prevent the narrowing of the gene pool of populations, the loss of genes that control the vital functions of the organism (reproductive capacity, resistance to diseases and extreme conditions), searches for ways to restore lost genes by means of methods of genetic engineering are being sought.

10. Preservation of the gene pool of local and vanishing races and species, which according to the level of productivity inferior to modern races, but in their genotype there are valuable qualities that modern races are gradually losing.

In the case of pond growing, the adaptability of fish to specific temperature-climatic conditions becomes of special importance.

So, in the northern areas of fish farming, the main task is to increase frost resistance. At growing of fish in the southern areas there is a need to increase the stability of fish to high temperatures. Zonal differences also apply to such important environmental factors as hydrochemical and hydrobiological regimes of ponds, peculiarities of the toxicological situation and epizootological situation (*Kozlov, Nikiforov-Nikishyn, Borodin, 2004*).

The main technological requirements for the selection of carp are intensive purposeful selection. The selective material until the time of the basic choice, which is carried out at the commercial age must be grown in conditions close to the production. At this stage of selection is unacceptable application of rarefied race-seat, or other optimizing factors, which significantly differs from the production technologies of growing of fish race-seat material and commodity fish. Intensive selection on this background can lead to undesirable consequences - the genetic fixation to fish of increased needs, the provision of which is impossible or economically inappropriate in industrial conditions.

Quite different technological requirements arise for industrial herds, that is growing usable sires. At work with industrial herds the task of their genetic rearrangement is not raised, and therefore intensive selection of fish is not required. Here it is made only corrective selection aimed at culling individuals that do not meet the standard. The conditions for growing breeding material from the very beginning should ensure a good graziery of fish, which contributes to the better development of reproductive abilities, which is achieved mainly due to their more rare race-seat in the pond and full feeding.

Selection and breeding work with fish are thus closely interconnected, but there are different forms of work with breeding material, which involve solving various problems and requiring a different approach to the selection and growing of breeding fish.

Selection work with fish is extremely complex; it requires the presence of a precious experimental base, so it is advisable to concentrate on specialized farms. The carrying out of these works is fulfilled, as well as under the guidance and with the direct participation of scientific institutions.

The difference between selection and breeding work with fish can be seen in the following schemes.

Selection farms, selection and genetic centers, experimental bases of institutes, specialized sections of industrial enterprises:

- carry out genetic improvement of objects (creation of new and improvement of existing fish races);
- have selection herds;
- the intensity of mass selection at the marketable age - high;
- conditions for growing of breeding fish to the main choice, which is carried out at the commercial age, are close to production.

Reproducer, reproduction complexes, industrial farms:

- are equipped with a user's herd;
- grow physiologically valuable sires and receive from them offspring for commodity growing;
- intensity of mass selection - moderate;
- conditions for growing breeding fish at all stages of growing are most favorable for the growth and development of fish.

The need for a clear differentiation of methodological approaches when at work with breeding and industrial (user) herd determines the specifics of the organization of selection and breeding business in carp growing (*Tomilenko, Aleksienko, Kucherenko, 1995*).

At fish selection in specific conditions of industrial farms the priority values have the task of increasing the stress resistance of races, adaptableness to an unusually high compactness of race-seat at growing in relatively small volumes of water, feeding almost exclusively with combined fodder in the absence of natural food, high content in water of exometabolites.

Thus, the accomplishment of the above-mentioned tasks will contribute to the development of breeding potential of Ukrainian carp races.

References

1. Bekh V.V. Problems of selection and breeding work in fish culture of Ukraine // Fish industry science of Ukraine. 2008. No.1. P. 27–29.
2. Kozlov V.I. Aquaculture / V.I. Kozlov, A.L. Nikiforov-Nikishyn, A. L. Borodin. - Moscow: Moscow State Technical University, 2004. 433 p.
3. Serpunin G.G. Biological basis of fish culture. Kaliningrad, Publishing House, Kaliningrad State Technkal University, 2003. 163 p.
4. Tomilenko V.G. Instruction on the organization of breeding work in carp growing of Ukraine. 3b Intensive Fish culture / V.G. Tomilenko, O.O. Alekseyenko, A.P. Kucherenko. K.: Agrarian Science, 1995. P. 3–33.
5. Sherman I. M. Breeding and selection of fishes / I.M. Sherman, M.V. Grinzhevsky, I.I. Gritsyniak. K.: "BMT", 1999. 238 p.

Karlova L.V., Lesnovska O.V., Mamrak V.D.

FEATURES OF SELECTION AND BREEDING WORK IN CARP GROWING

Dnipro State Agrarian and Economic University

Modern breeding work in fish culture provides a complex of organizational and fish farming measures aimed at improving of hereditary qualities and increasing the productivity of pond fish. These measures include technically correct growing and model keeping of fish, observance of the right methods of choice and selection, and provision its full nutrition at all stages of development.

The main object of warm-water stable fish farming for today is carp. In the selection work with the carp, two problems are solved: improving the productive qualities at the expence of application of the method of nidification selection and creation of races, adapted to specific cultivation conditions. The differentiation of these tasks has conditional character, because in any case it is a question of improving productivity against the background of specific cultivation conditions.

Thus, the implementation of the above-mentioned tasks will contribute to the development of breeding potential of Ukrainian carp races.

Kharytonov M.M., Tkalich Y.I.

ENVIRONMENTAL ASSESSMENT OF THE WATER OBJECTS AVAILABILITY FOR FISHERY IN THE DNIPROPETROVSK REGION

Dnipro State Agrarian and Economic University

49600, Dnipro, Serhii Efremov Str., 25, envteam@ukr.net

The bottom silting of such water bodies as ponds, artificial channels and small rivers has led to a decrease in their biotic potential. Industrial and mining activities of enterprises together with soil erosion processes create additional environmental risks of contamination of bottom silt. Toxicological assessment of bottom sediments is necessary. It is important to know the timing of the beginning of the removal of silt from the bottom of water bodies. In the case of artificial water channels is possible to multiply the flow rate of the water. Hydrochemical parameters of water in the channel can be used as indicators of the water body silting, as well as various biomeliorative measures to provide good conditions for fishery. It is possible to distinguish two problems associated with biomeliorative measures of sludge deposits. Management practices influencing the load and decomposition rates in ponds include water exchange, sediment removal, aeration, fallowing period between crop cycles and liming. In the case of ponds using for fish farming the water is drained just after fixing of significant silting of these objects. After that, the bottom of the pond passes the stage of phytomelioration and phytoremediation. In the case of small rivers and artificial canals, the bottom is cleaned and mud can be used to increase the fertility of marginal lands.

Management practices influencing the decomposition rates in ponds on sediments quality include fallowing period between crop cycles and liming.

The method of surface water quality ecological assessment used in this work was the basis for the analysis of hydrochemical monitoring data, determining the surface waters quality from the environmental positions point of view, including information on the status of the water body, to determine trends in water quality in time and space, to study the