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## **Selection-pedigree work and process of breeding small-scutal intrapedigree type of Ukrainian frame breed of a carp**

**Goal.** to provide a fishery assessment for the newly emerged germinating type of Ukrainian carp species. **Methods.** Commonly accepted in fish culture and breeding using methods of processing and data analysis. During the period of growing fish, fertilizers were carried out using organo-mineral fertilizers, feeding fish with feed mixes. **Results** A new non-lactic intra-breed type of Ukrainian carp species was created, consisting of three factory lines: Nivkivska, Lebedinskaya, Transcarpathian. His fishing characteristics are given. Enriched hereditary basis of the newly created carp type determines its high productive qualities: high growth rate, viability, high fertility, winter resistance, resistance to diseases. **Conclusions** A new non-strain intra-breed type of Ukrainian carp species with high fish-biological characteristics and an attractive commercial appearance was created. The creation of a new genetic structure of the carrot carp allowed to increase the genetic fund of the state fish farming of the state, to promote the prevention of inbred depression in the population of the Ukrainian carpet carp. He possesses high combining ability as the initial form in conditions of industrial hybridization.

*Key words: fish breeding, breeding, carp, breed, intra-breed type.*

In increasing the productivity of fish farms, selection and breeding work is aimed at increasing the economically useful features of objects fish breeding [11, 13, 15, 23].

The current task at the present stage is to create a sufficiently wide variety of local breeds for different climatic zones countries [5, 7].

The main cultivating object in the stable fish farming of Ukraine, as well as in a number of other countries, remains the cultural carp, which is a product of the long-term occupation of the European *Cyprinus carpio carpio* L. subspecies. [16]

Improvement of the productive qualities of Ukrainian carp breeds is based on their structuring by the creation of new breeding herds, zonal, intra-breed types [19, 24, 25].

At the same time, there is a change in consumer demand. Buyers like corps with scaled-up scales, loose or bare.

The purpose of the research is to assess the available carp breeds and to determine the reference points for breeding.

The research, as well as the practical work on the introduction of a new germinate domestic genus type of the Ukrainian carp species, was carried out from 1993 to 2010.

**Materials and methods.** The material for the study was the nursery and multi-annual rejuvenated young calf of the germinate domestic genus type of Ukrainian carp species [2 - 4, 14, 19, 20].

In the period of fish breeding, common fishery measures were used, organically-mineral fertilizers were used, fish fed with feed mixes. The descendants of the carp were obtained by the factory method.

The fishery evaluation of carps for breeding, collection and processing of materials for controlling the conditions of the maintenance of the breeding material was carried out in accordance with the applicable methods [1, 6, 9, 12, 19, 21-23, 25].

**Research results.** During the years of research, the conditions for the maintenance of pedigree repair young animals of carp in wintering stages were satisfactory. Thus, fish were wintered at the temperature of

water (during the ice age) 1.2 - 2 ° C. The content of oxygen dissolved in water in wintering stages - within the limits of fishponds. Hydrogen index (pH) - weak-grained - 7.6 - 8.5.

During the unloading of winterers, a spring inventory of multi-age groups of young breeders of small-breed carp was carried out, which as a result of which it was established that their wintering - within the limits of fishery norms (80-90%). As a result of the inventory, selection was made for the tribe of the best in terms of growth, exteriors and typical fishes of all age groups. Repair young animals were planted in an abdomen in summer repair ponds.

Tribal fish planting density did not exceed 3 times, which corresponds to the norm of breeding carp.

In the herd of pedigrees, the repair youngsters were transplanted into 4- (♂♂) and 5-year-old (♀♀) ages.

During breeding nunnery formation, the breeding nests were formed.

In the 2nd half of May, at spawning grounds, in the factory conditions the reproduction of the carrot carp was performed.

The carp of the 4th, as well as the previous breeding generations of the carob carp, have high reproductive rates. Thus, the level of their positive reaction to hormonal stimulation reached 89.6%, the average weight of ovulated eggs - 1.42 - 1.50 mg, working fecundity of females - 668 - 952 thousand eggs.

Three-day larvae for density 60 thousand plants / ha were grown in growing breeding grounds.

During the growing season, the conditions for growing pedigree material of small-scale carp corresponded to fishery norms. The water temperature in the soils ranged from 5 to 28 ° C, the oxygen dissolved in water was satisfactory, at most not below 3 mgO / l, pH 7.4-8.4.

As a result of the carried out work, the breeding flocks of the semi-breeding flocks of the Ukrainian bream type carp were formed.

*The first stage of the selection process (1993 - 1997).* In 1993, at the Nyvka Research Institute of the Institute of Fisheries of the UAAS, the work of the first stage of the breeding process for the production of a new carrot-type carp UMKF1 was started. During this, a reciprocal cross-breeding of the Ukrainian Framed Romanian and Romanian Fresin breeders was conducted.

At the beginning of breeding work, a lot of attention was paid to the exterior characteristics of the newly created type, therefore, during the formation of the breeding herds of the first breeding category, the intensity of selection by weight and the desired type of body structure (scaling frame) was quite high and reached 5% at the age of one year (after winter) and 20% at the age of two-year-olds. In the course of the transfer of senior care to a herd of pregnant women, an adjustment selection based on sexual characteristics was made, which was about 80%.

According to the results of researches of 1993-1997, it was established that:

- UMKF1 carps are characterized by improved exterior impressions and high enough productive qualities;
- the majority of productive indices in the experimental carps of UMKF1 showed a significant heterozosis effect, with exterior and interior indices being average in relation to outgoing parenting forms;
- Maluskutami carp UMKF1 in the 1st to 2nd years of life exceeded the initial forms and normative values for the Polissia / Forest-steppe zone for all major fish indicators. Among the F1 carps, the reciprocal form ♀YP × ♂Φ was found to be better than the productive qualities.

*The second stage of the selection process (1998-2003).* In 1998-1999, 3 plant lines were established in the structure of a new type of small-scale carp in order to enrich and expand its genetic structure, as well as to improve the adaptation to specific ecological-climatic regions of Ukraine: Nivkivska, Lebedinskaya and Transcarpathian. These lines (branching) have different genesis, different share of heredity of the breed, different exterior and productivity.

*Investigation of cartilage carps of the Nivki factory line UMKN F2.* In order to lay the Nyvky factory line, reciprocal cross-breeding of UMKF1 females of the UR × F and F × UR remises originated with the Romanian fresinate feminine breeds was conducted. The main direction of further breeding was to determine the improvement of the exterior and the quality of the scaling in the form of a frame while preserving the high reproductive qualities inherent in the Ukrainian framed breed.

During the subsequent years of 1998-2003, breeding stock breeding herds of the 2nd generation of F2 breeding were formed and a complete fishery-biological assessment was provided to them. In particular, in the season of 1999, it was established that in the first year of life, according to indicators such as: the

percentage of fertilization of caviar and its development at the stage of morula and mobile embryo, the number of hours required for hatching prelings, as well as weight 3. There were no significant differences between the young UMKN F2 and the carp UMKF1 (in itself), while the fresinaceous breed was significantly inferior to these two forms.

The comparative cultivation of carps of UMKN F2 for semi-intensive technology in the state enterprise "Nyvka", as well as their winter keeping and the formation of breeding herds, revealed the following features:

- the origin of the carp F2 was stable enough and high yield from the growing ponds (40,9 - 43,2%), which testifies to their quality as a fish-plant material;

- The winter frost resistance of UMCF forms F was kept at a sufficiently high level, much higher than that of a fresinette breed. Thus, the output of single-rivers from wintering stands was 80.9% for mass losses of 9.2% and a decrease in the coefficient of fattening by 0.053, which practically corresponds to regulatory requirements;

- two-year-olds F2 reached an average weight of 852-890 g for leaving the feeding stakes at the level of normative indicators of 80.0 - 81.5%, which eventually ensured the productivity of 804.4 - 826.8 kg / ha;

- the use of inverse cross-breeding with the Romanian breed of fresinatoes made it possible to significantly improve the basic exterior performance of carp F2. The index of high-resiliency and fertility rate in the form UMKN F2 (UMKF1 × F) was  $2.26 \pm 0.022$  and  $3.58 \pm 0.029$  respectively, only slightly less than the Romanian breed;

- F2 carp has qualitative reproductive characteristics, in particular, it has been possible to significantly improve the level of positive reaction to hormone stimulation from 66.7 to 83.7%, the average weight of the native egg has also slightly increased and averaged  $1.51 \pm 0,023$  mg for working fertility at the level of  $601,3 \pm 34,32$  thousand eggs and variability 34,2%;

- In 2001, the first cryopreservation test for male semen of the males of the second generation of breeding males was conducted, with the selection of two best pedigrees, both in exterior and reproduction. After control defrosting, it was found that sperm motility and survival rates for cryopreservation technology in the form of open 0.2 ml granules were significantly higher and ranged from 4 to 4.5 balls.

*Investigation of malleus carps of the Lebedin factory line UMKL F2.* Beginning from 1998 - 1999 in the Open Society "Lebedinskaya RMS" the work of the 2nd stage of the selection of maloway carp of the new type UMKL F2 of the Lebedinsk factory line was started. For this purpose, cross-breeding of UMKF1 females (UR × F) with males UMKF1 (F × UR) was performed. For the main direction of further selection of cores of the Swabian factory line, the F2 was determined to improve the productive qualities (weight and viability), while improving the exterior and quality of the scaly cover in the form of a frame of the desired form and standard. The recipe variant of UMKF1 (UR × F) was used to improve reproductive characteristics, since the latter are largely inherited from the maternal line [10].

During the next 5-6 years, repair-breeding herds of the 2nd generation of breeding of the Swan's production line were formed and provided them with a comprehensive fishery-biological assessment. In particular, during the control, the productivity of the cultivating pond No. 3 in the 2001 season reached 1199 kg / ha at the time of the release of the young born from natural spawning larvae (68.5%). The costs of combines were lower than the standard ones and 3.71 units. with a protein content of 22.5%.

During the trial period, the winter stability of carps F2 of the swan line was 72-85%, depending on the characteristics of a particular winter season. Thus, after winter winter maintenance, in 2001-2002, wintering was 79.7%, which practically corresponds to the normative indicators characteristic of this soil-climatic zone [18].

The main selection among the carps of the Swan line was carried out in the first year at an intensity of 4.1 - 10%, with a small selection differentials by body weight.

The main criterion during the mass selection was the correspondence of the lining cover of the desired type and standard, while the breeding material of the 2nd year of cultivation, by the nature of the scaling, practically approached the fresinette breed.

During the research period, several times, the control of the production of small-footed carp (two-year old) in industrial conditions under semi-intensive technology used on the farm was carried out.

In particular, the productivity of the two-year-olds during the control cultivation in the 2002 season reached 1208.1 kg / ha for the consumption of feed 2.8 units. (111-1-Ukr, the content of crude protein - 23%), which can be considered a satisfactory result. For a sufficiently high planting density (2000 eggs / ha), the average weight of carps of UFCL F2 was 701 g in the case of gain of 89.7%.

The average values of the index of high-resilience and fattening coefficient of carps of the UMFC F2 at the marketing age are  $2.35 \pm 0.023$  and  $3.48 \pm 0.045$  respectively, which corresponds to the desired type of body structure. In general, the highest volatility was observed due to the weight of the body due to it the lack of high tenseness of selection for this indicator after the first year of cultivation.

Studies on reproductive potential in spawning ponds showed that the carps of F2 of the Lebedin line had a fairly high fertility, while the yield of 3-day-old larvae from one breeding nest was on average 277.5 thousand specimens, which is 1.85 times the normative value [18].

According to the results of the factory reproduction and incubation campaign 2006, it was established that the productive fertility of males in the Kryvorizhilyrbgosp OJSC is 600.8 thousand eggs, relative - 82.4 thousand eggs / kg in 100% positive reaction for hormonal stimulation. In general, during the spawning season of 2004-2006, the positive reaction of females to hormonal stimulation in this household was 92%, which is the best indicator among all originator companies.

*Investigation of the carrot carps of the Zakarpatskaya factory line UMKZ F2.* The breeding of the noodle carrot in OJSC "Transcarpathian Fish Processing Plant" was started in 1999. In the ribo-kennel "Gorbok", crosses were carried out in the reciprocal version of the UMKF1 pedigrees with carps of the Lyubin intra-breed type of Ukrainian framed breed. The main purpose of these crossings is the creation of a separate Transcarpathian carp production line (UMKZ F2), which would be best suited to local specific conditions, at the same time, with the preservation of the high-resilience and meat exteriors of the Romanian breed of fresinatoes. During the next 5-6 years, the breeding flocks of the 2nd generation of the Transcarpathian factory line breeding were formed and provided them with a comprehensive fishery-biological assessment. It was established that in the first year of life, according to indicators such as: the percentage of fertilization of caviar and its development at the stage of morula and moving embryo, the number of hours required for hatching prelings, and the mass of 3-day larvae, there was no significant difference between young UMKZ F2 and carps of the Lyubin intra-breed type of Ukrainian framed breed. In general, the carp of both experimental variants had high development rates in early ontogenesis, in particular the fertilization of caviar in carp UMKZ F2 was 90.9%, the development of caviar in the stage mobile embryo - 75.5%. Due to the corresponding growth of YMKZ F2 and carps of the Lyubin intra-breed type in semi-intensive technology at OJSC Zakarpattia Fish Processing Plant, it was established that according to the integrated indicator of fish products, carp UMKZ F2 slightly exceeded the carps of the Lyubin intra-breed type - 1004.64 vs. 993.58 kg / ha, in the case of growing at 67.2 and 65.8% respectively.

As for the index of winter resistance, the carp of the 2nd breeding generation practically did not differ from the Lyubin frame carts, during which winter and cold resistance was one of the main goals [8, 24, 25]. Output of UMKZ F2 carps from wintering stages in the 2004-2005 season was 83.5%, which exceeded the normative value for this climatic zone by 3.5%, while the weight loss and reduction of fattening factor during the winter period was also within normative values.

The newly created small-scale carp type has a number of fish-farming advantages, in line with the available normative and technological indicators of fish farming both in the first year of cultivation and in the marketable 2-year-old age.

Malouistic carps are characterized by excess weight and exterior characteristics. They are characterized by high viability. The death of the breeding material in both the summer and winter stages does not exceed 3 - 5%.

Currently, the work is ongoing on the selection of malollusk-carp on the main economic features.

Stabilization selection is used to preserve the high fishery and biological features that are inherent to the newly-formed germplasm of the intra-breed type of the carp of the Ukrainian framed breed, as well as their fixation in subsequent breeding generations in the structure of its breeding [17].

## Conclusions

As a result of the breeding and breeding work, a new high-productive intra-breed type of maloloust carp of Ukrainian fossil breed, which has a high growth rate, increased fecundity, winter resistance, disease resistance and attractive appearance that contributes to the - Mann High Fish and Economic Indicators.

The creation of a new genetic structure of the carrot carp allowed to increase the genetic fund of the state fish farming of the state, to prevent the inbreeding of inbred depression in the population of Ukrainian carpet carp. He has a high combining ability as an initial form in conditions of industrial hybridization.

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