OPTIMIZATION OF GROWTH TECHNOLOGY A JUVENILE SILVER CARP*(HYPOPHTHALMICHTHYS MOLITRIX* VALENCIENNES, 1844*)* DURING POSTEMRYONAL STAGE, THROUGH THE APPLICATION OF SOY MILK TECHNOLOGY, ADDITIONAL FEED

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Abstract

Soy is one of the best sources of food for fish culture, high protein content, omega-3 fatty acids and unsaturated fat, which support and ensure healthy growth and development, starting from the earliest stages of life. This study evaluated the influence of technology management soy milk on growth performance of juvenile carp during postembryonal development. The results showed that the use of soy milk significantly influenced the quality and quantity of the fish material. Total increase growth and survival was significantly higher in the experimental ponds (B2, B3, B4), as compared to the control pond (B1). Biological material has developed under normal conditions without the development of pathological conditions, technological or human factors that affect the proper conduct of the experiment. Physico-chemical parameters of the water, except for short periods of thermal variation, were placed in the optimal range for the growth of silver carp. The implementation of this feed-and-feed technology for the development of the trophic base, originally and widely applied in Southeast Asia, determines the optimization of fish production in ecological conditions and lower production costs, without adversely modifying the quality of technological water , stimulation of planktonic biomass and superior assimilation of food. In this technology of silver carp larval stage feeding (Hypophthalmichthys molitrix Valenciennes, 1844) did not involve the administration of organic fertilizers, only pre-starter feeds were used, water supply level and flow rate from the pre-emergence basins was used to maintain the quality of the technological water. Growth and survival gains in the experimental ponds (average weight 0.52-0.63-0.74 g / ex, S 60-65-70%), compared to the control pond (average weight 0.25g / ex, S 40%), which shows that the application of supplementary feeding technology to soy milk, ensures a higher growth and survival rate, better assimilation of food, stimulation of planktonic biomass and maintaining optimal quality of physical-chemical parameters of water, which recommends the introduction and application of this wide-scale technology within the framework of the fisheries, with the strict observance of the way of preparing and administering this nutritional supplement.

Key words: silver carp, pre-development, soy milk, growth optimization

INTRODUCTION

The strategic objectives of aquaculture in the medium term mainly concern the development of production to meet consumer needs quantitatively and qualitatively by creating complex products in terms of nutritional, safe food or ecological terms. Quantifiable target is that by 2020 aquaculture to ensure every inhabitant of the planet consumes at least 12 kg / year. Studying new ways to improve the microclimate factors within the fisheries systematic semisystematic, under application of an improved method of preservation of bioresources aquatic natural and artificial can lead to increased production of aquatic biomass, turnover, profit [1]. Soy is one of the best sources of fish feed by the high content of omega-3 fatty acids, high protein and unsaturated fat content. High quality soy protein is often used in fish farms to support

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healthy growth and development of stocks and achieving superior production [2]. The paper presents the results of the administration of soy milk on growth performance of larvae carp (*Hypophthalmichthys molitrix* Valenciennes, 1844) in the pre-development period. he experiment took place in 2018 in the experimental base BRATEŞ Institute of Research and Development for Aquatic Ecology, Fishing and Aquaculture Galati.

MATERIAL AND METHOD

The biological material has been the subject of experiments which were represented by silver carp (*Hypophthalmichthys molitrix*, Valenciennes 1844). Pre-development was performed in the four experimental groups of experimental ponds - B1, B2, B3 and B4 each having an area of 1 ha, and an average depth of 0.8 m and the initial end of 1.20 m.

Photo 1 – Experimental basin B1

Photo 2 – Experimental basin B2

The base of the experiments were considered the following elements:
-Providing a requisite biological habitat of the fish species that are within the following parts;
-Surface 1 ha ground ponds, the minimum depth of 0.8 m;
- growing basins have power plants and independent water outlet;
- basins ensure a complete vacuum;
-basins are not overrun by vegetation.
B1 experimental basin (BR10) - 2,000,000 larvae / ha (control pond) -photo 1;
Experimental basin B2 (BR11) - 2,000,000 larvae / ha-photo 2;
Experimental Basin B3 (BR12) - 2,000,000 larvae / ha-photo 3;
Experimental basin B4 (BR13) - 2,000,000 larvae / ha-photo 4.

The average initial body mass of the biological material was 0.009 g /ex.

Photo 3 – Experimental basin B3

Photo 4 – Experimental basin B4

The four ponds were prepared, and fed populated identical.

In Asia, soy is cultivated and consumed daily over four millennia.

But cultures have spread throughout the world, including Romania.

Initially started in eastern China, soybeans were quickly spread to the entire planet, especially due to the high nutritional value of the grain but also because it is a less demanding plant.

Technology for preparing soy milk:

- to obtain soybean milk the amount of 2.500 liter required 125 kg of yellow soybean (*Glycine max*);

- it is hydrated for 5-6 hours at a water temperature of 25-30ºC;

- rinse, wash and will draied for 1 hour;

- will grind and added water in the ratio of 1:10, then the milky consistency substance will be transported and administered in experimental ponds.

It will be for 10 days, after which is interrupted [3] [3.1]. Technological indicators are absolutely necessary in order to obtain information on the performance of applied technology and the farming system used.

The actual growth increment - (Sr) - was determined gravimetrically and the two samples consisted of weighing the time of stocking, determining the initial mass, and the two samples at the end of the growing period and determining the final weight. Was calculated using the formula: Sr = Bf - Bi[kg] where Bf, Bi - initial and final biomass of the batch [kg].

Individual growth rate of growth - was determined by the formula: (Wf - Wi) / N [g / ex.] Where Wf, Wi - initial and final average weight of the batch [g]; N - number of copies [ex.].

The daily rate of growth - (GR) - was determined by applying the formula: (Wf - Wi) / T [g / day] where Wf, Wi - average mass of the final and initial batch [g] T - cycle of growth [days].

Survival Procent - (%) - was determined by the formula: Nf / Ni x 100 [%] where Nf, Ni - number of final copies.

The method is based on fish biometric comparison of different measurements together (or indicated, expressed as dimensionless ratios or percentages).

Duration of the experiment amounted to a total of 21 days.

Feed the biological material initially forming a feed type prestarter powder consisting of milk powder and fish meal 1: 1, crude protein 30% in the first week were administered 15 kg feed per pool, up to 35 kg per ponds, in the six tables given in the last 10 days of growth.

RESULTS AND DISCUSSIONS

Following analysis of the data at the end of the experiment (fishing harvest) in 4 ponds obtained were obtained yields: 20 kg basin B1-control (feed without the addition of soy milk) 62 kg basin B2 (fed and addition 250L soy milk per day), 81 kg in the basin B3 (fed and added 500L soy milk per day in two portions, at from 09 and 12) şi103 kg basin B4 (fed and added 750 liter soy milk per day in three portions at 09 hours, 12, 15).

Biotechnological indicators obtained are shown in tab. 1.

Table 1 Bioproductive indicators obtained in experimental ponds

Popular parameters	**B1**	**B2**	**B3**	**B4**
Silver carp	2 mil.	2 mil.	2 mil.	2 mil.
Initial biomass – kg -	18	18	18	18
Individual mass – g -	0.009	0.009	0.009	0.009
Initial density kg/ha -	18	18	18	18
Fishing				
No. Of copiues				
Silver carp	8.000	12.000	13.000	14.000
Final biomass– kg-	**20**	**62**	**81**	**103**
Survival (%)	**40**	**60**	**65**	**70**
Growth parameters				
Final individual mass – g - Silver carp	0.25	0.52	0.63	0.74
Final density - kg/ha -	20	62	81	103
No. Growth days	21	21	21	21
Silver carp	0.011	0.024	0.03	0.035
Incrase de total gain – kg -	2	44	63	85

CONCLUSIONS

Implementation of this technology for feeding and secondary development food chain base, originally applied widely in Asia Southeast determines optimization increase fish production in ecological conditions and lower production costs without adversely alter water quality technology, planktonic biomass and uptake stimulating the top of the food.

In this technology larval feeding of carp ((*Hypophthalmichthys molitrix* Valenciennes, 1844) did not involve the administration of organic fertilizers, is used only prestarter feed and insurance type and level of the river the optimum feed rate of pre-development.

Most production and survival was obtained in the experimental basin B4 which received the highest amount of soy milk, 750L, three times a day for 10 days. Given that the B1 control the production of carp was almost 3-fold lower compared to B4 and more than 2 times the B2 and B3 it can be said that the use of this technology enables, in particular, the growth of those species micro-fitoplanktonofag more especially in the early stages of development.

The same observation on and connected Survival.

Among the ingredients of vegetable protein, soya flour is considered the most nutritious source of protein from plants.

However, the high concentration of anti-nutrients has limited the inclusion of soybean meal levels in aquafeed.

Compared with fish meal, soy protein concentrate has the advantages of high co-efficient of protein and amino acid digestibility available and consistent quality.

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